San Joaquin Valley Air Pollution Control District
Authority to Construct
Application Review

Facility Name:	Big West of California, LLC	Date:	SEP 0 3 2008
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Application #(s):	S-33-407-0, '408-0, '409-0, '410-0, '411-0, '413-0, '415-0 and '416-0		
Project #:	1061149		
Deemed Complete:	July 27, 2006		

I. Proposal

Big West of California, LLC (Big West) has proposed a major upgrade to the refinery located at 6541 Rosedale Highway, Bakersfield (Areas 1 and 2). This project, which Big West refers to as the "Clean Fuels Project", proposes the installation of process equipment to convert approximately 25,000 barrel per day (bpd) of heavy gas oil to gasoline, diesel and LPG. In addition to gas oil, the refinery currently produces 21,800 bpd of gasoline and 20,300 bpd of diesel fuel. The gas oil produced at the refinery is currently exported to other refineries for further processing into higher valued products. The project will not increase the overall input capacity of the refinery, which is approximately 70,000 bpd of crude oil.

The District's review of the Clean Fuels Project is contained in three documents: projects S-33, 1061149 (new processing equipment for converting heavy gas oil), S-33, 1062742 (modifications to mild hydrocracker #14 and new storage tanks) and S-3303, 1062741 (modifications to truck loading operations). The Clean Fuels Project is considered a single project for the purposes of compliance with New Source Review requirements and for evaluation of the project's impact on ambient air quality and air contaminant toxic risk.

The following is a list of the equipment being added at the Big West refinery in project S-33, 1061149:

S-33-407-0	Hydrogen Generation Unit (HGU2)
S-33-408-0	Vacuum Gas Oil Hydro-De-Sulfurization Unit (VGO-HDS)
S-33-409-0	Sour Water Ammonia To Ammonium Thiosulfate Unit (SWAATS)
S-33-410-0	Fluid Catalytic Cracking Unit (FCCU)
S-33-411-0	Liquid Petroleum Gas (LPG) Merox Unit And Alkylation Unit
S-33-413-0	Ground Level Flare
S-33-415-0	Forced Draft Cooling Tower
S-33-416-0	Forced Draft Cooling Tower

The gas oil feed will be primarily processed into lighter hydrocarbon products in the FCCU. Prior to the processing in the FCCU, the feed will be treated in the VGO-HDS to remove sulfur and nitrogen. The hydrogen used in the VGO-HDS will be produced in HGU2. Sour water produced in the VGO-HDS will be treated in a sour water stripping unit (SWSU), which will be listed and included with the VGO-HDS. Sour water stripper gas liberated from the SWSU will be treated in the SWAATS unit to produce a marketable liquid fertilizer product. The Merox unit will treat LGP from the FCCU and from an existing delayed coking unit to remove H_2S and mercaptans. Treated LPG from the Merox unit will flow to the alkylation unit where low octane propylenes and butylenes will be converted to high-octane iso-paraffins.

Big West received their Title V Permit on February 28, 2003. This modification is classified as a Title V significant permit modification pursuant to Rule 2520, Section 3.29. At the applicant's request the project is being processed with a Certificate of Conformity (COC). Since the facility has specifically requested that this project be processed in that manner, the 45-day EPA comment period will be satisfied prior to the issuance of the Authority to Construct. Big West must apply to administratively amend their Title V Operating Permit to include the requirements of the Authority to Construct issued with this project.

The County of Kern is the lead agency for this project for the requirements of the California Environmental Quality Act (CEQA). This project is also subject to requirements of the Prevention of Significant Deterioration permitting program administered by the Environmental Protection Agency (USEPA).

II. Applicable Rules

Rule 1080	Stack Monitoring (12/17/92)
Rule 1081	Source Sampling Monitoring (12/16/93)
Rule 2201	New and Modified Stationary Source Review Rule (12/15/05)
Rule 2520	Federally Mandated Operating Permits (6/21/01)
Rule 4001	New Source Performance Standards (4/14/99)
Rule 4002	National Emissions Standard for Hazardous Air Pollutants (5/20/04)
Rule 4101	Visible Emissions (02/17/05)
Rule 4102	Nuisance (12/17/92)
Rule 4201	Particulate Matter Concentration (12/17/92)
Rule 4301	Fuel Burning Equipment (12/17/92)
Rule 4305	Boilers, Steam Generators and Process Heaters – Phase 2 (08/21/03)
Rule 4306	Boilers, Steam Generators and Process Heaters – Phase 3 (03/17/05)
Rule 4311	Flares (06/20/02)
Rule 4351	Boilers, Steam Generators and Process Heaters – Phase 1 (08/21/03)
Rule 4454	Refinery Process Unit Turnaround (12/17/92)
Rule 4455	Components at Petroleum Refineries, Gas Liquids Processing Facilities, and Chemical Plants (04/20/05)
Rule 4801	Sulfur Compounds (12/17/92)
Rule 7012	Hexavalent Chromium - Cooling Towers (12/17/ 92)

CH&SC 41700 Health Risk Assessment
CH&SC 42301.6 School Notice
Public Resources Code 21000-21177: California Environmental Quality Act (CEQA)
California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387: CEQA Guidelines
Federal NSR Requirements for PM2.5 – 40 CFR Part 51 Appendix S

III. Project Location

The facility is located at 6451 Rosedale Highway Bakersfield, CA. The equipment is not located within 1,000 feet of the outer boundary of a K-12 school. Therefore, the public notification requirement of California Health and Safety Code 42301.6 is not applicable to this project.

Project location drawings are included as ***Appendix A***.

IV. Process Description

Gas oil from the existing refinery vacuum crude and coking units will be converted to lighter hydrocarbon products in the process equipment being installed in this project. The gas oil feed stock is currently being sold and exported for upgrading at other facilities.

Each process unit being added is discussed below. Process flow drawings for the proposed equipment are included as ***Appendix B***.

<u>S-33-407-0 - Hydrogen Generation Unit (HGU2)</u>

To supply the hydrogen required to operate the new VGO-HDS unit, an additional hydrogen generation unit (HGU2) will be installed. This unit is designed to produce 50 MMscfd of high-purity (99.9 mol%) hydrogen (H_2).

Treated refinery gas from the amine unit and purchased natural gas are mixed with a small percentage of recycle hydrogen and then heated. The preheated natural gas is passed through a hydrotreater bed to convert any sulfur compounds (primarily mercaptans) to H_2S, and then through a zinc oxide (ZnO) absorber to remove the H_2S. The ZnO catalyst bed is disposed of approximately once every two years.

The mixed feed gas is then combined with steam and then preheated, using flue gas, to about 1,000°F in the convection section of the steam-methane reforming (SMR) furnace. Preheated mixed feed is fed through a manifold header arrangement to SMR furnace tubes that are filled with nickel catalyst and placed vertically inside the SMR furnace box. The steam-gas reforming reaction takes place inside the SMR furnace tubes as per the reactions shown below:

(1) $CH_4 + H_2O \rightarrow CO + 3H_2$ (Methane reforming)
(2) $CO + H_2O \rightarrow CO_2 + H_2$ (Shift reaction)

The reforming reaction is highly endothermic and the heat of reaction is supplied by an array of burners.

Product gas (reformed gas) coming out of reformer tubes is at ~1,600°F and is composed roughly of 75% H_2, with the remainder being carbon monoxide (CO), carbon dioxide (CO_2), methane (CH_4), and un-reacted excess water.

The flue gas leaving the SMR furnace box (radiant section) is at ~1,800°F. The flue gas is cooled down in the convection section of the furnace to ~300°F before being vented to atmosphere through a stack. Heat recovery within the convection section consists of a steam superheating section, steam generation section, and boiler feed water (BFW) pre-heater.

The reformed gas is cooled and fed to a high temperature shift converter (HTSC). The HTSC is a fixed-bed catalytic reactor. The exothermic shift reaction shown above reduces the CO content of the reformed gas to about 3-4 percent, thereby producing more hydrogen. Synthesis gas is cooled, and any condensed water is separated in a knockout drum. Synthesis gas exiting the knockout drum is fed to the pressure swing adsorption (PSA) unit.

The PSA unit operates continuously, using individual beds that operate in a batch mode. The unit consists of a series of vessels containing an adsorbent media. The pressurization and depressurization of these beds goes on in a sequence, one after another, such that the purification process is operated continuously.

As the PSA vessels are pressurized, the media will preferentially adsorb undesirable gases such as CO, CO_2, and CH_4. When the vessel is depressurized, hydrogen, which was not adsorbed by the bed, is released from the vessel. Upon further depressurization, the adsorbed gases (CO, CO_2, and CH_4) desorb. Depressurization of the beds to a very low pressure regenerates the adsorbent, and the PSA reject gas is used to supplement the SMR furnace fuel gas supply. The H_2 stream produced in the HGU2 will be supplied as 99.9 mol% pure H_2 to the new VGO-HDS unit to produce low sulfur fuels.

The new SMR furnace will have a maximum-fired duty of approximately 641 MMBtu/hr, and, for the control of NOx emissions, will be equipped with low NOx burners and selective catalytic reduction (SCR). Net steam export is estimated to be 44,000 to 109,000 lb/hr of 300 psig steam.

<u>S-33-408-0 - Vacuum Gas Oil Hydro-De-Sulfurization (VGO-HDS) Unit</u>

Currently the refinery exports approximately 25,000 BPD of gas oil from the delayed coker unit and the crude unit to other refining facilities. These intermediates are high in sulfur and nitrogen. The VGO-HDS unit will remove these contaminants, allowing the gas oils to be converted into products such as gasoline and diesel in the FCCU. The new products will meet the specifications for California fuels. Liquefied petroleum gas (LPG) from the FCCU will be further treated for sulfur removal in the Merox unit prior to being fed to the alkylation (akly) unit. The alky unit will convert low octane hydrocarbons to high-octane gasoline blending components.

The VGO-HDS will be designed to process approximately 30,000 BPD of gas oils to reduce the sulfur and nitrogen content and produce a feedstock that is suitable for the Fluid Catalytic Cracking Unit. The combined feedstock to this unit (which is currently sent off-site) contains an average of 1.2 wt% sulfur and approximately 7,200 ppmwt nitrogen. The gas oil feed to the FCCU will be treated in the VGO-HDS to reduce the sulfur content to < 400 ppmwt and nitrogen content to < 1000 ppmwt.

The VGO-HDS feedstock will be filtered and combined with high purity (99.9 mol%) hydrogen (H_2) from the HGU2. The feed will be heated in the reactor effluent/feed exchanger, and then in a fired process heater. The feed will then be fed to the reactor and passed through a series of catalyst beds. Hydrogen will also be added between each catalyst bed. Sulfur and nitrogen in the feed will react with the hydrogen and be converted to hydrogen sulfide (H_2S) and ammonia (NH_3). The reactor effluent will be cooled in the reactor effluent/feed exchanger and then sent to the high-pressure hot separator.

Liquid from the separator will be flashed in the low-pressure hot flash drum. Liquid from the flash drum will be routed to a sour water stripper to remove H_2S and NH_3 from the hydrocarbon product. The treated gas oil will then be routed to the FCCU. Cold flash drum and hot flash drum liquids are sent to the VGO-HDS steam stripper.

Overhead vapor from the high-pressure hot separator, the low-pressure hot flash drum, and the VGO-HDS steam stripper overhead will be cooled and flashed in a series of steps to separate the hydrogen from the other components. The off gases from these vessels (minus the hydrogen) will be sent to the amine contactor, which purifies the gas using methyl diethanolamine (MDEA) before it is sent to plant fuel. The separated hydrogen will be sent to a knockout drum before being returned to the reactor via the recycle gas compressor. The H_2S-rich MDEA from the amine contactor will be sent to an existing MDEA regenerator.

An unstabilized naphtha product will be withdrawn from the VGO-HDS steam stripper overhead receiver and will be reprocessed. This unstabilized naphtha product will have a sulfur content of < 5 ppmwt and a nitrogen content of < 15 ppmwt.

The VGO-HDS unit will have two gas-fired heaters, both of which will be equipped with low-NOx burners and SCR. The VGO feed heater and the VGO-HDS fractionator feed heater will have fired duties of 47 and 35 MMBTU/hr, respectively.

Wash water will be used to aid in the separation of H_2S and NH_3. Sour water generated in this process will be sent to the new sour water stripper unit (SWSU) to remove the H_2S and NH_3. The sour gas from the sour water stripper will be sent to the SWAATS unit.

Sour water stripping is the most commonly used process to remove dissolved H_2S and NH_3 from process sour water. Process sour water is generated from refinery hydrotreating and cracking processes and contains the sulfur and nitrogen that have been removed from the hydrocarbons streams. Before the sour water can be reused, the H_2S content in the water must be reduced to the maximum practical extent, generally to 2 ppmwt or less.

The proposed SWSU will provide facilities for removing hydrocarbons and for stripping NH_3 and H_2S from the sour water produced in the VGO-HDS unit, and from sour water produced in existing Area 2 process units, mild hydrocracker unit #14 (HCU) and catalytic reforming unit #3 (HTU-3). The sour water from the new VGO HDS unit will first be pumped to a 3-phase separator that is designed to remove 90+% of the gas/liquid hydrocarbon (HC) from the sour water by means of internal baffles and tilted plates. A new three-phase separator will also be installed to handle phenolic sour water produced in the FCCU and HF Alky units. After separation, the water will be sent to the existing Phosam unit, which produces anhydrous ammonia and H_sS rich gas. The Phosam unit currently handles sour water from the existing delayed coking unit (DCU) and the HCU & HTU-3 units. Upon project completion, the HCU & HTU sour water streams will be sent to the new hydro sour water stripper. The DCU stream will continue being processed at the Phosam unit, with the sour water streams produced in the FCCU and HF Alky units being added. The H_2S rich gas from the Phosam unit will continue to be sent to existing sulfur recovery units (SRU 1 and 2), but could be sent to SWAATS if SRU 1 and 2 are down.

From the 3-phase separator, the sour water will be pressured over to existing tanks 71-T24M01 and 71-T24M02. At these 2 tanks, the sour water from the VGO-HDS mixes with the "existing" sour water coming from the HCU and HTU-3. From these sour water tanks, skimmer nozzles will be used to intermittently pump off small amounts of floating HC liquid to HC recovery.

In the SWSU, steam fractionation of the sour water occurs in a trayed or packed tower. Gaseous H_2S and NH_3 are evolved out the top of the tower and "stripped" sour water (free of the vast majority of hydrogen sulfide and ammonia) is produced out the bottom.

The SWSU has a maximum capacity of 265 gpm of sour water containing approximately 29,000 wppm of NH3 and 41,000 wppm H2S dissolved in the water. At the SWSU both sulfuric acid and 20 Be' sodium hydroxide may be injected as needed to control pH and expedite the stripping process. The gas from the SWSU overhead will be sent to the SWAATS unit, and the stripped sour water will be sent partially to waste water treatment and partially recycled and reused at the VGO HDS, FCCU, or other units as wash water or makeup water.

Sour water from the FCCU is phenolic in nature and will be treated in the existing phenolic sour water treating system. Sour water from the FCCU (95 gpm normal, 135 gpm design) will flow to a 3-phase separator, where 90+% of the hydrocarbons will be removed. FCCU sour water will then be pressured into existing tank 71-T24M03. Additional phenolic SW from the DCU is currently held in existing tank 71-T24M04. The new and existing phenolic water streams will be sent to the 2 existing Phosam sour water strippers (23V4, 23V5) for removal of the NH3 (as anhydrous ammonia) and H_2S as a high quality SRU feed gas ("Phosam Gas"). The stripped sour water from strippers 23V4 and 23V5 is primarily sent to the waste water treatment unit for disposal.

Excess phenolic sour water beyond the capacity of the Phosam strippers is sent to the Area 15 SWSU (15V12) for stripping along with sour water from HTU1 and the mild hydrocarcking unit (MHCU). Area 15 sour water stripping gas (SWSG) goes to SRU 1 and 3 as gaseous feed. Stripped sour water primarily goes to the waste-water treatment unit for disposal.

A caustic scrubber fuel gas treatment system will be constructed as part of the "Clean Fuels Project" and will be associated with the VGO-HDS permit unit. This system will be constructed to treat Aera 3 fuel gas that will be supplied to the "Clean Fuels Project" combustion equipment. The unit will be located downstream of the Area 3 amine treatment operation, permit unit S-34-5. The caustic scrubber will reduce non-H_2S sulfur compounds to the extent necessary to ensure that the fuel gas meets the limits for total sulfur required by the "Clean Fuels Project" combustion equipment. After amine treatment, Area 3 gas will be treated in the caustic scrubber to remove carbonyl sulfide (COS) and mercaptans. The new treatment unit uses caustic to extract these sulfur compounds, which are then converted to disulfide oil.

<u>S-33-409-0 - Sour Water Ammonia To Ammonium Thiosulfate Unit (SWAATS)</u>

The SWAATS will produce ammonium thiosulfate (ATS) solution, a marketable liquid fertilizer product, by removing the sulfur and ammonia present in the sour water stripper gas (SWSG) and the sulfur present in the amine acid gas.

The SWAATS unit consists of two different sour water stripper off-gas (SWSG) contactors, an H_2S combustor/catalytic reactor train and an SO_2 wet scrubber.

The principle reaction takes place in the SWSG contactors and is the reduction/oxidation (redox) reaction between sulfide and the sulfite ion, as follows:

$$6\ NH_3 + 4\ SO_2 + 2\ H_2S + H_2O \rightarrow 3\ (NH_4)_2S_2O_3 \text{ (ammonium thiosulfate)}$$

This reaction occurs in the SWSG contactors. Within the contactors, a circulating solution of ammonium thiosulfate and ammonium sulfite absorbs the ammonia and some of the H_2S from the SWSG. The absorbed H_2S rapidly reacts with sulfite ion in solution to form thiosulfate ions.

Excess H_2S from the SWSG is combined with amine acid gas and oxidized to provide SO_2 for the reaction. To prevent formation of SO3, the oxidation is carried out in two steps: the first in a combustor with a sub-stoichiometric air supply in which the H_2S is oxidized, and the second at low temperature in a catalytic reactor with excess air. Conversion of all sulfur species, including COS and CS_2, to SO_2 is complete.

The conditions of oxidation do not produce NO_x, as the stream is in a reducing environment when at high temperatures, and is only exposed to an oxidizing environment at the lower temperatures of the catalytic reactor (600 – 900 °F), which is to low for thermal NO_x formation. Hydrocarbon (VOC) will be emitted directly from sulfur scrubber vent, as small amounts of hydrocarbon in the SWSG are absorbed by the ammonium thiosulfate and ammonium sulfite solution and liberated in the scrubber. Gaseous hydrocarbon not absorbed in the SWSG contactors passes to the sub-stoichiometric burner and is oxidized, creating some CO, which is emitted from the scrubber vent.

In the SO_2 scrubber the gas from the oxidation section is scrubbed by the ammonia-rich solution recirculated from the SWSG contactors. The sulfite-rich solution from the SO_2 scrubber is split into two streams. The larger portion recirculates to the second SWSG contactor while the rest contacts the SWSG in a initial contactor where it absorbs just enough H_2S to react with the sulfite ions to produce ATS. The resulting stream is withdrawn as product ATS solution. Approximately 64,000 gal/day of 60% ATS solution will be produced, equivalent to 92.2 tons per day of sulfur recovered.

SO_2 emissions to atmosphere from the SO_2 absorption stage are reduced to low concentrations in a final wet scrubber. The scrubbed tail gas is free of H_2S and contains less than 30 ppmv of SO_2. Water is added or condensed from the vent gas to control the water concentration in the ATS product.

<u>S-33-410-0 - Fluid Catalytic Cracking Unit (FCCU)</u>

Treated diesel and oil from the VGO-HDS unit will be routed to the FCCU. The FCCU will convert this mixture of gas oil feeds to lighter products, such as LPG, gasoline and diesel. The FCCU will process up to 30,000 BPD of gas oils and diesel.

The FCCU consists of three sections: the reactor/regenerator, the main fractionation section, and the gas concentration section, each of which are discussed further below.

<u>Reactor/Regenerator Section</u>

Gas oil feed from the feed surge drum is preheated in the FCCU feed/main column bottoms exchanger. It then mixes with atomizing steam in the feed nozzles and enters the reactor riser. Here it is contacted with hot circulating catalyst, and the cracking reactions take place. The oil vapor and catalyst mixture exit the vertical riser through a vortex separation system, where the primary separation of catalyst and oil vapor takes place. The product gas continues through the reactor cyclones, which perform a further separation of the entrained catalyst, and then flows to the main fractionation section.

Spent catalyst is stripped with steam to remove hydrocarbon vapors and flows from the reactor stripper to the regenerator. The spent catalyst contains small quantities of coke deposits (a by-product of the cracking reactions) that are burned off the catalyst through contact with air in the regenerator. The catalyst and air mixture flows upward through the regenerator riser, and then through a disengager to separate the catalyst from the flue gases. Hot flue gas then flows through two stages of regenerator cyclones to remove catalyst particles that are still entrained in the exhaust. Hot regenerated catalyst flows back into the reactor riser.

The main air blower provides air for the regeneration of the catalyst. A direct-fired heater (89 MMBtu/hr), with low-NOx burners, is used to heat the air during start-up. As the catalyst regeneration is exothermic, the heater will not be used during normal operation.

The FCCU will employ a catalyst additive to convert most of the sulfur oxides (SOx) in the regenerator flue gas to metal sulfate, which is then converted to H_2S in the reactor. This will result in very low SOx levels in the exiting flue gas (< 20 ppmvd). The combustor/ regenerator provides nearly complete combustion of the carbon on the catalyst to CO_2, with CO in the exiting flue gas at 100 ppmv or less.

The hot flue gas (~1,370°F) will be used to generate 600-psig steam in the flue gas steam generator. Nitrogen oxide emissions in the FCCU regenerator exhaust will be controlled through the use of full-burn regenerator technology, and further reduced with selective catalytic reduction (SCR). Taken together, these technologies will limit NOx emissions to 20 ppmv (annual average). Particulate emissions from the FCCU regenerator will be reduced through the proper design of the FCCU regenerator, and installation of a Pall Filter, which taken together will reduce particulates to 0.3 lbs PM_{10}/1000 lb of coke burned. To reduce sulfur oxide emissions from the FCCU, the feed will be aggressively hydrotreated to remove sulfur compounds. Additionally, sulfur-reducing catalysts will be added to the FCCU, which together with the hydrotreating of the gas oil feed will limit flue gas SOx emissions to 20 ppmv (annual average). These pollution controls meet or exceed Best Available Control Technology for fluid catalytic cracking units.

Main Fractionation Section

From the reactor outlet, the product travels to the Main Fractionation section where the products are separated into the following streams:

- Overhead wet gas
- Unstabilized gasoline;
- Light cycle oil (LCO); *and*
- Main column bottoms product.

A sour water stream is produced, which will be routed to a new sour water stripper

The main fractionation section contains the main fractionator column, an LCO stripper, LCO coalescer, main column receiver, bottoms/raw oil feed exchanger, main column bottoms/BFW exchanger, and main column bottoms steam generator.

The overhead material, wet gas and unstabilized gasoline product, will be sent to the gas concentration section for recovery of light hydrocarbons and gasoline. The LCO product will be reprocessed within the refinery.

Gas Concentration Section

In the gas concentration section, wet gas (vapor from the main fractionator overhead) will be fed to a 2-stage wet gas compressor, and from there will be compressed and sent to the high-pressure separator (HPS). Vapor from the HPS will be sent to the primary absorber, where C3s (propane, propylene, etc.) and heavier components will be removed and recovered.

Vapor from the primary absorber will contain a small amount of gasoline, and will be routed to the sponge oil absorber for product recovery. The lean gas exiting the top of the sponge oil absorber will be sent to an amine absorber for H_2S removal, and then to the refinery fuel gas system.

Unstabilized gasoline from the Main Fractionation Section will be used in the primary absorber as lean oil to extract the C3s and heavier components from the HPS vapor. The rich oil from the primary absorber will be cooled and routed to the HPS. Liquid from the HPS will be sent to the stripper, for removal of C2s, H_2S and water. Stripper overhead will be routed back to the HPS. Stripper bottoms will be sent to the debutanizer. The debutanizer overhead vapor will be condensed, and a portion of the liquid returned to the debutanizer tower as reflux. The remainder will be LPG product, sent for further processing to the new LPG Merox Unit. The debutanizer bottoms will be stabilized gasoline and will be added to the gasoline pool.

<u>Other Operating Modes</u>

Start-up and shutdown operations, which will be performed infrequently (planned shutdowns occur approximately once every 4-5 years), will result in emissions in excess of the normal operating emissions presented in this application. Specifically, compliance with the normal operating limits for NOx and CO will be difficult to attain. This is due primarily to the unique operating characteristics and transient nature of these operating conditions. During start-up, the main air blower is used to raise the temperature of the reactor and regenerator to approximately 300 °F. No combustion will occur during this operation. To heat the reactor and regenerator further, the start-up heater will be vented through the process equipment. Once the flue gas heats the SCR system to 600 °F, ammonia injection will begin and NOx emissions will be controlled. During the remaining start-up activities, compliance with the NOx emissions limit is expected.

CO emissions will remain essentially uncontrolled during the entire start-up process, though CO minimization measures will be implemented. First, during start-up, CO-reducing catalyst additive will be used to reduce these emissions. Additionally, the FCCU will be maintained in an excess air environment to further drive CO emissions down.

<u>S-33-411-0 - Liquid Petroleum Gas (LPG) Alkylation Unit with Merox Feed Treatment Unit</u>

Liquefied petroleum gas will flow from the FCCU and existing Delayed Coking Unit (DCU, S-34-3) to the Merox Unit. These feeds contain organic sulfur compounds (mercaptans), which must be removed before alkylation. The Merox unit will be designed for 13,500 BPD of the combined feed from the FCCU and DCU. The LPG feed will flow to the amine absorber, where it is contacted with lean amine to remove H_2S. From there, it will enter the caustic pre-wash tower to neutralize any residual H_2S not removed by amine absorption. LPG will then flow to the extractor, where the upward flowing stream will contact a caustic solution (NaOH) flowing counter-currently down the column. Mercaptans in the LPG will be dissolved in the caustic solution. The extraction reaction is shown below:

$RSH + NaOH \leftrightarrow NaSR + H2O$

Temperature will be maintained below 105ºF to allow formation of sodium mercaptide (NaSR). The treated LPG product will flow to the caustic knockout drum, and then through a sand filter to remove entrained caustic. The LPG will then flow to the Alky Unit.

The mercaptan-rich caustic solution will be injected with air and will flow to the oxidizer. The caustic solution will contain a water-soluble catalyst that promotes the caustic regeneration reaction:

$4\ NaSR + O_2 + 2\ H2O \rightarrow 2RSSR + 4\ NaOH$

In the oxidizer, the dissolved mercaptans will be oxidized to disulfides. The oxidizer effluent will flow to the disulfide separator. The vent gas from the separator will be used as fuel gas. Naphtha will be added to the regenerated caustic, to wash the disulfide oils out of the caustic. The mixture will be separated in the naphtha settler, with the regenerated caustic recirculated to the extractor. The naphtha containing the disulfide oil will be sent to a closed drain header, and reprocessed within the refinery.

The treated LPG from the Merox unit will flow to the Alky unit, which will have a design throughput of 13,500 BPD. In the Alky unit, low octane propylene and butylenes will be converted to high-octane iso-paraffins. The primary reactions are:

$C_4H_8 + C_4H_{10} \rightarrow C_8H_{18}$

isobutylene + isobutane → isooctane

$C_3H_6 + C_4H_{10} \rightarrow C_7H_{16}$

propylene + isobutane → isoheptane

The LPG feed will pass through a solid bed desiccant to remove water. Purchased isobutane (7,300 BPD) and in-plant isobutane (700 BPD) will also be dehydrated. These two streams are the makeup isobutane to the unit.

The propylene and butylene (both olefins) are reactive with isobutane; however, a catalyst such as hydrofluoric acid (HF) must be present to make the reaction happen. To avoid the environmental and health risks associated with the use of hydrofluoric acid as a catalyst, the alkylation process at the Bakersfield refinery will use a modified HF (MHF) catalyst in association with UOP's Alkad™ technology. In the Alkad™ process, alkylation reactions take place in the presence of liquid polyhydrogen complexes rather than HF acid as they would in a conventional HF Alkylation Unit. An additive is used which reacts with the HF to form a polyhydrogen fluoride complex. This complex contains a long chain of strongly associated HF molecules. It is the strong association that reduces the tendency of the HF molecules to form an aerosol upon release to the atmosphere. The low physical vapor pressure of the polyhydrogen complex also contributes to reduced aerosol formation. Recycled HF acid and the polyhydrogen complex additive will be combined and sent to the reactor. Makeup MHF will be delivered premixed to the Bakersfield Refinery and no anhydrous HF will be stored onsite. The alkylation reactor will be a vertical heat exchanger. The process will be on the shell side, and flow will be upward. Cooling water will flow through the tubes. The MHF will be introduced into reactor bottom. The LPG and the recycle isobutane streams will be mixed and introduced into the shell side of the reactor/heat exchanger through several nozzles along the length of the shell. The nozzles will atomize the hydrocarbon into very small droplets into the MHF, which is essential for through mixing, high-octane product quality and byproduct minimization.

The MHF will catalyze the reaction of olefins and isobutane to high-octane iso-paraffins. The reaction will be exothermic, and heat will be removed via the cooling water. The reaction mixture will flow out of the reactor top into a settler, where it separates into an oil phase and a MHF phase. Similar to water, HF separates from oil and is heavier than the oil. The modified MHF is sent to the Alkad^{TM} recovery section of the Alky Unit where the polymers are removed and the modified HF is recycled back to the reactor, with very small losses. The Alkad^{TM} recovery section will keep the consumption of the additive to a low level and facilitate the separation of polymer from the modified HF complex. The Alkad^{TM} recovery section will include an additive stripper column, bottoms separator, and overhead receiver.

Hydrocarbon from the settler will be preheated and charged to the iso-stripper. The iso-stripper bottoms will be the product alkylate, which will be treated with potassium hydroxide (KOH) to neutralize any residual HF and sent to storage. Un- reacted isobutane will be withdrawn as a side-cut and recycled to the reactor. A side-cut of normal butane product will be withdrawn from the iso-stripper, sent for defluorination, and then treated with KOH.

The iso-stripper overhead, consisting of isobutane, propane, and MHF, will be cooled and sent to the depropanizer feed settler. MHF from the Alkad^{TM} recovery section will be recycled to the reactor. Hydrocarbon from the settler will be sent to the depropanizer. The depropanizer overhead will be sent to the HF stripper to strip out residual HF, resulting in high-purity propane. Isobutane from the bottom of the depropanizer will be returned to the reactor. Overhead vapor from the HF stripper will be returned to the depropanizer overhead system.

All MHF vents and relief valves will be piped to a relief gas scrubber. In the event of an emergency release, MHF gases will pass up through the scrubber and contact a circulating KOH solution, which will neutralizes the MHF. The neutralized gases will be sent to the ground level flare and combusted. The KOH solution will be regenerated periodically using lime to form calcium fluoride and KOH. The calcium fluoride will be routed to the neutralizing basin.

The Alky unit will have an iso-stripper reboiler (fired process heater), equipped with low-NOx burners and SCR. The fired duty will be 215 MMBTU/hr.

The Alky unit will be designed to minimize the MHF inventory and operate at low pressure, and it will include a rapid HF dump system in the event of a leak of MHF. In addition, the unit will be equipped with water curtains that will activate automatically in the event of an MHF release. All of these measures will act to minimize the impact of any potential MHF release.

S-33-413-0 - Ground Level Flare

The project will require that a ground flare be constructed to combust process gases from the new process units in emergency situations and during planned startup and shutdowns.
The flare will be equipped with a flare gas recycle system that control all routine releases of gasses to the flare header. The recycle system will consist of two 250 cfm compressors, each with a design capacity to handle the normal expected load of gas to the flare. Purge gas at a rate of approximately 100 scf will be sent through the high and low pressure headers and will be recycled by the compressors. The flare headers will be equipped with a water seal.

The proposed ground level, multi-point flare will utilize staged combustion to optimize pressure and combustion properties with changes in flow. The flare is constructed with high and low pressure sections, with a single low pressure stage and multiple high pressure stages. The low pressure section will have a maximum rating of 1.4 MM ACF/HR and will be equipped with steam or air assist. The high pressure section will have a maximum rating of 21 MM ACF/HR and will be non-assisted. As flow increases, pressure is increased. At a certain set point, the pressure controller opens the second stage control valve, and pressure is reduced as flow is directed to the second stage burners. If the flow continues to increase, the pressure will increase again. At the same set point, the pressure controller will open the third stage, with the cycle continuing for as many stages as is necessary. If the pressure goes below a certain pressure, the controller will close stages. This is done so that pressure is never reduced to the point where the operation would not be smokeless. Each stage has a bypass around the control valve that contains a valve with a rupture pin; this ensures that if the control system fails at a pressure slightly higher than the set point, the rupture pin will fail and the bypass will open, allowing the gases to be combusted.

The flare will be equipped with a pilot light at each flare opening and a thermocouple that will continuously monitor the presence of the pilot burners.

S-33-415-0 and '416-0 – Induced Draft Cooling Towers

Two induced draft, evaporative cooling towers are proposed for this project. One cooling tower will provide cooling water to the shell and tube heat exchangers in the VGO-HDS, FCCU, the Merox unit, the HGU2, and various other new utility and process units, except the Akyl unit, which will have a dedicated cooling tower. Each cooling tower will have a maximum cooling water recirculation rate of 15,000 gallons per minute (gpm).

V. Equipment Listing

S-33-407-0: HYDROGEN GENERATION UNIT (HGU2) WITH 641 MM BTU/HR STEAM METHANE REFORMER (SMR) FURNACE WITH FIFTY (50) 10.3 MM BTU/HR CALLIDUS MODEL CFRG-4 BURNERS OR EQUIVALENT, AND SELECTIVE CATALYTIC REDUCTION EMISSIONS CONTROL SYSTEM

S-33-408-0: VACUUM GAS OIL HYDRO-DE-SULFURIZATION (VGO-HDS) UNIT WITH 47MM BTU/HR FEED HEATER WITH ZEECO MODEL GLSF 11 ROUND FLAME AND ZEECO GLSF 7 FLAT FLAME BURNERS OR EQUIVALENT, 35 MM BTU/HR FRACTIONATOR FEED HEATER WITH ZEECO MODEL GLSF 11 ROUND FLAME BURNERS OR EQUIVALENT, SELECTIVE CATALYTIC REDUCTION EMISSIONS CONTROL SYSTEM, AND INCLUDING HYDRO SOUR WATER AND PHENOLIC SOUR WATER 3-PHASE SEPARATORS, HYDRO SOUR WATER STRIPPING UNIT, AMINE TREATMENT UNIT, AND CAUSTIC FUEL GAS SCRUBBER TREATING AREA 3 GAS AND LOCATED DOWNSTREAM OF AMINE TREATMENT OPERATION (S-34-5)

S-33-409-0: SOUR WATER AMMONIA TO AMMONIUM THIOSULFATE (SWAATS) UNIT

S-33-410-0: FLUID CATALYTIC CRACKING UNIT (FCCU) WITH 89 MM BTU/HR STARTUP HEATER, SELECTIVE CATALYTIC REDUCTION AND PALL CORPORATION HIGH TEMPERATURE PARTICULATE FILTER

S-33-411-0: LIQUID PETROLEUM GAS (LPG) ALKYLATION UNIT WITH MEROX FEED TREATMENT UNIT AND 215 MM BTU/HR ISO-STRIPPER REBOILER WITH 8 ZEECO, MODEL GLSF-14 ULTRA-LOW-NOX BURNERS OR EQUIVALENT AND SELECTIVE CATALYTIC REDUCTION EMISSION CONTROL SYSTEM

S-33-413-0: GROUND LEVEL FLARE WITH LOW PRESSURE SECTION WITH AIR-ASSIST, MULTIPLE CALLIDUS MODEL BTZ-MP BURNERS (OR EQUIVALENT) AND A MAXIMUM GAS THROUGHPUT RATING OF 21 MM ACF/HR, AND MULTI-STAGE HIGH PRESSURE SECTION WITH MULTIPLE CALLIDUS MODEL BTZ-MP BURNERS (OR EQUIVALENT) AND A MAXIMUM GAS THROUGHPUT RATING OF 1.4 MM ACF/HR

S-33-415-0: 15,000 GPM INDUCED DRAFT COOLING TOWER WITH HIGH EFFICIENCY DRIFT ELIMINATOR SERVING FCCU, VGO-HDS UNIT, MEROX UNIT, HGU2 AND OTHER ASSOCIATED PROCESS EQUIPMENT

S-33-416-0: 15,000 GPM INDUCED DRAFT COOLING TOWER WITH HIGH EFFICIENCY DRIFT ELIMINATOR, SERVING THE ALKYLATION UNIT

VI. Emission Control Technology Evaluation

Fugitive Emissions

The equipment proposed in this project will require the installation of thousands of valves, flanges, connector, pressure relief vents, pump and compressor seals and other components.

These components have the potential for significant VOC emissions.

Fugitive emissions from components will be minimized by adoption of a leak detection and repair program (LDAR) that meets the requirements set forth Subpart GGG, District Rule 4455 and BACT.

Process Heaters

Four full time use process heaters will be installed as part of the Big West clean fuels project: a 641 MM Btu/hr steam methane reformer (SMR) furnace (S-33-407-0), 47 MM Btu/hr feed heater and 35 MM Btu/hr fractionator feed heater (S-33-408-0), and a 215 MM Btu/hr iso-stripper reboiler. An 89 MM Btu/hr process heater that is associated with the FCCU will only be used during the infrequent startups of that unit. Air contaminants (VOC, NOx, CO, SO_x and PM_{10}) are released from the combustion of treated refinery gas in these. The control technologies and methods required for these units are discussed below.

Selective catalytic reduction (SCR) will be used on steam methane reformer (SMR) furnace, iso-stripper reboiler, 47 MM Btu/hr feed heater and 35 MM Btu/hr fractionator feed heater. SCR is post combustion technology, where in the presence of a reducing catalyst and excess oxygen and at high temperature, oxides of nitrogen are chemically reacted with injected ammonia to form nitrogen and water. Depending on the inlet NOx concentrations, SCR can achieve between 80 and 90% reduction.

All four process heaters will be equipped with ultra low NOx burners for the control of NOx. Ultra Low NOx burners work by controlling aspects of the combustion process to limit the production of NOx. Excess air is controlled within a tight range, usually to less than 2%. Staged combustion is employed to obtain a well-mixed, stable flame, which prevents high peak flame temperature that lead to high thermal NOx production.

The FCCU startup heater will be used only during startups of this unit, which are expected no more than once every 3 to 4 years. Total time of operation during a startup is not expected to exceed 72 hours. The heater exhausts through the FCCU regenerator and is controlled for NOx by the FCCU selective catalytic reduction system, after the operating temperature of the catalyst is reached. Also during a startup, an oxidation catalyst is introduced along with the equilibrium catalyst, which provides an unknown level of control for CO.

Each of the process heater proposed for this project will be fired on treated refinery gas. Refinery gas will be produced in the conversion of gas oils to constituent products as described in the application. The produced gas will be treated in a new amine treatment system to remove H2S and blended with treated refinery gas from Area 3 to achieve sulfur content not to exceed 40 ppmv, measured as total sulfur. To achieve the required sulfur content, a new caustic scrubber will be installed downstream of the Area 3 amine treatment system to remove non-H_2S sulfur compounds. This level was determined to be the lowest technologically feasible level attainable using amine and caustic treatment systems and blending, For VOC and CO, the applicant will use modern burners and institute good combustion practices to limit emissions of these pollutants. Good combustion practices will maintain CO emissions at low levels: < 50 ppmv @ 3% O2 for the 47 MM Btu/hr feed heater and 35 MM Btu/hr fractionator feed heater and < 10 ppmv @ 3% O2 for the steam methane reformer furnace and the iso-stripper reboiler.

FCCU – Catalyst Regeneration (S-33-410-0)

Emissions from the FCCU catalyst regenerator include NO_X, CO, VOC, PM_{10}, and SO_X.

Combustion VOC emissions are primarily controlled using good combustion practice to establish the optimum conditions within the regenerator. Regenerator temperatures, recirculation rates, and exhaust gas oxygen concentrations and temperatures will be monitored and adjusted as necessary to maintain the operation of the full burn unit within prescribed ranges.

A selective catalytic reduction (SCR) unit will be used to control NOx emissions. The SCR unit is being designed for the specific conditions expected within the regenerator exhaust. The unit will be active above 615 ° F with the injection of ammonia. Ammonia slip will be monitored and controlled to ≤ 10 ppmv. NOx exhaust gas concentrations will be monitoring using a NOx continuous emissions monitor. The SCR is expected to have a useful life of between 3-5 years.

The applicant has proposed a full burn FCCU regenerator. The full burn design is inherently lower emitting for NOx and CO emissions. Partial burn regenerators typically employ a CO boiler to recover heat, converting CO to CO_2. The full burn design adds enough air to convert the CO directly to CO_2 without a CO boiler.

Particulate matter emissions from the regenerator will be reduced through proper design of the FCCU regenerator and installation of a high temperature, exhaust gas filter (Pall Filter). Each of the two Pall filters contains 1,080 filter elements, which are tubes packed with stainless steel porous powder filter media. The tubes are arranged inside of a 136" diameter x 473" long shell and are cleaned once every 8 hours by injecting a reverse flow of high-pressure air.

Sulfur emissions from the FCCU are controlled by hydrotreating the feed stock prior to it's introduction into the FCCU and by the injection of chemical additives into the circulating equilibrium catalyst. Hydrotreating is accomplished in the VGO-HDS unit, the operation of which is discussed elsewhere in this review. Within the VGO-HDS, the sulfur content of feed will be reduced by more than 96% by weight, from 12,000 to 400 ppmw. The chemical additives convert SO_x from the regenerator to metal sulfate, which is circulated to reactor and converted to H2S. The H2S is carried with the lean gas from the gas concentration section to the amine treatment system where it removed as elemental sulfur. SO_2 levels in the regenerator are reduced by more than 90% using chemical additives, to < 20 ppmvd.

Sour Water to Sour Water Ammonia Thiosulfate (SWATTS) (S-33-409-0)

The purpose of the SWATTS unit will be to remove sulfur and ammonia from the sour water stripper gas (SWSG) and amine acid gas and produce a marketable fertilizer product, ammonium thiosulfate $3(NH_4)_2S_2O_3$. This process requires that a some of the H2S from the SWSG and amine acid gas be oxidized to SO_2 in a two-part process consisting of substochiometric burner and catalytic reactor with excess air. In the SO_2 absorber section, SO_2 is scrubbed by the ammonia rich solution from the SWSG absorber. SO_2 is emitted from the top of the SO_2 absorber, but such emissions are controlled to 30 ppmv SO_2 through a wet scrubber top section. In addition to SO_2, small amounts of VOC and CO are emitted from the SO_2 absorber vent. To control the amount of hydrocarbon vapor in the feed, the sour water stream is treated through a three-phase separator and surge tank with hydrocarbon skim. Hydrocarbon remaining in the sour water stripper gas (SWSG) and amine acid gas feed streams is oxidized primarily to CO_2 but also CO. Residual VOC is vented.

Multi Point, Ground Level Flare (S-33-413-0)

The applicant has proposed an engineered flare that will be designed to be smokeless and have a high VOC destruction efficiency. The ground level flare will have high and low pressure section with multiple stages per section. Steam or air assist will be provided to individual stages as required to ensure high destruction efficiency and smokeless operation. The flare will be served by a flare gas recovery system that will direct all routine venting of gas back through the amine treatment system and to the refinery fuel gas system. The flare will only operate during defined emergencies and during periods of startup and shutdown of process equipment.

Induced Draft Cooling Towers (S-33-415-0 and S-33-416-0)

PM_{10} and VOC will be emitted from refinery cooling towers. PM_{10} will be emitted within the "drift", which is recirculated cooling water that is vented out the top of the tower, expressed as a percentage of the total volume of recirculated water. The dissolved solids contained in this water end up as particulate emissions as the water evaporates. The water coming from heat exchangers that are used to cool process steams has the potential to be contaminated with VOC from pipe and component leaks. VOC may be in turn transferred through leaks within the cooling tower heat exchange piping to the recirculating water and emitted with the drift.

PM_{10} emissions will be reduced by the installation of high efficiency drift eliminators. These devices are placed atop the heat exchange elements and serve to collect water droplets that condense out as the fans move water and vapor through them. The eliminators provide a high surface area and a tortuous path to effect the collection of the water droplets that is expected to reduce drift by greater than 98%.

VOC emissions from the cooling tower are fugitive in nature and will be controlled through a leak detection and repair program.

VII. General Calculations

A. Assumptions

Fugitive Emissions

1. Based on a preliminary design estimate, the applicant has provided the numbers and types of fugitive of components required for the proposed project. The component totals include a 20% contingency factor, following the guidance established in District policy SSP 2015. All proposed emissions units, except the SWAATS, will be assessed fugitive VOC emissions. All components included in the SWAATS permit unit will not be in VOC service, exclusively handling fluid streams with 10% or less VOC by weight. District policy SSP 2015 states that components handling fluid streams having a VOC content of 10% or less by weight are not assessed fugitive VOC emissions.

2. Emissions factors were derived from the method set forth in the CAPCOA publication *California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities* (February 1999), "Correlation Equations and Factors for Refineries and Marketing Terminals (Table IV-3a). For each component type, emission factors were developed for seven screening value (SV) ranges, < 100 ppmv, 100 to < 500 ppmv, 500 to < 1,000 ppmv, 1000 to < 2,000 ppmv, 2000 to < 5000 ppmv, 5000 to < 10,000 ppmv and > 10,000 (pegged), using the appropriate correlation equation from Table IV-3a and the mid point SV from each range.

3. For each component type, the total number of components assigned to each SV range was based on historical monitoring data from the refinery. For example, the historical percentages of valves in light liquid service V (LL) have the screening values within the seven identified ranges are shown below:

SV Range	Midpoint	V(LL) %
0<100	50	0.9864
100<500	300	0.0046
500<1,000	750	0.0021
1,000<2,000	1,500	0.0033
2,000<5,000	3,000	0.0024
5,000<10,000	7,500	0.0011
Pegged	N/A	0.0002

<u>Process Heaters</u>

1. Each combustion unit is assumed to operate 24 hr/day and 365 days/yr.
2. The heating value of the refinery gas is 1200 Btu/scf.

FCCU (S-33-410-0)

1. The FCCU is assumed to operate 24 hr/day and 365 days/yr.
2. The regenerator flue gas rate as provided by the applicant is 9146.8 lb·mol/hr.
3. The heating value of refinery gas is 1200 Btu/scf.
4. Maximum daily emissions of NO_x and SO_x have been calculated using the 7-day rolling average permitted concentration limits. Maximum daily emissions of CO have been calculated using the NSPS Subpart J concentration limit, 500 ppmv @ 0% O_2.
5. Yearly emissions of NO_x, SO_x, CO and ammonia slip and yearly and daily emissions of VOC have been calculated using the permitted concentration limits, in ppmv @ 0% O_2 (365-day rolling average for NO_x, SO_x and CO), the respective molecular weights and the maximum design flue gas flowrate, in lb · mol/hr.
6. PM_{10} emissions are based on the proposed PM_{10} emissions rate, 0.3 lb/1,000 lb of coke burned, and the maximum coke burn rate of 18,487 lb/hr.

Multi-Point Ground Level Flare

1. The flare will be used for emergency flaring and for flaring during the startup and shutdown of process equipment. The flare is being permitted based on one startup and shutdown per year for each process unit. Emissions calculations will be based on the non-emergency quantities of flared gas, which are the permitted quantities of startup/shutdown gases and continuous pilot gas combusted in the unit.
2. The applicant has established the maximum hourly, daily and yearly combustion rates. The maximum hourly rate was used for modeling hourly Ambient Air Quality Standards and health risk. Maximum daily emission rates (158.2 lb/day NO_x, 60.5 lb/day PM_{10}, 860.6 lb/day CO and 146.5 lb/day VOC) were calculated assuming combustion of 24 hrs of pilot gas and 6 hours of flare gas. The maximum hourly and daily emissions rate of sulfur, 100.3 lb/day as SO_x, assumes a maximum daily limit from startup/shutdowns of 100 lb/day plus continuous, full time pilot gas combustion. The maximum yearly emissions rate of sulfur, 396 lb/yr as SO_x, assumes a maximum yearly limit from startup/shutdowns of 248 lb/yr plus continuous, full time pilot gas combustion. The yearly flare gas combustion rate for startup and shutdown events is 2268.6 MM Btu/yr. The maximum daily and yearly pilot light combustion rates are, respectively, 72 MM Btu/day and 26,280 MM Btu/yr.
3. The sulfur content of the pilot gas is assumed to be 40 ppmv as S (0.0056 lb/MM Btu as SO_x). The sulfur content of the gas combusted during startup and shutdown events is assumed to be 160 ppmv as S (expressed as a composite EF for a combination of both 300 and 1200 Btu/scf gas, 0.04691 lb/MM Btu as SO_x). The heating value of the fuel combusted in the flare is 1200 Btu/scf, expect for the gas from the VGO-HDS, which is assumed to have a heating value of 300 Btu/scf.
4. Emissions factors are from District policy FYI-83, with the SO_x emissions factors as described above.

SWAATS

1. Only SO_2, CO and VOC will be emitted from the SWAATS unit.
2. SO_2, CO and VOC, emissions have been calculated using the permitted concentration limits, in ppmv @ 0% O_2, the respective molecular weights and the maximum absorber vent gas flowrate, 8.73 MM Scf/day.

Cooling Towers

1. Cooling tower particulate matter emissions will be calculated based on a maximum water circulation rate of 15,000 gal/min, a maximum total dissolved solids (TDS) of 2,000 ppm by weight, and a maximum drift of 0.0005%.
2. The cooling tower has the potential to emit VOC from leaking components and pipes within the heat exchange section. Cooling tower VOC emissions will be based on historical data from the refinery's other cooling towers, as reported in the annual emissions inventory report.

B. Emission Factors:

Fugitive

The CAPCOAA correlation equation derived emission factors are expressed in lb/hr per component for each of the seven SV ranges and are included in fugitive emission calculation spreadsheets, ***Appendix C***.

Process Heaters

S-33-407-0 (HGU2) and S-33-411-0 (Isostripper Reboiler)

Pollutant	Emissions Factor	Source
NO_x	5 ppmv @ 3% O_2	Proposed, Achieved in Practice BACT
SO_x	0.0056 lb/MM Btu[1]	Refinery Fuel Gas Sulfur Limit by Mass Balance
PM_{10}	0.0076 lb/MM Btu	AP-42 Chapter 1.4 (07/98)
CO	10 ppmv @ 3% O_2	Proposed, achieved in practice BACT
VOC	0.0054 lb/MM Btu	AP-42 Chapter 1.4 (07/98)

1. $$\frac{40\,scf\,S}{10^6\,scf}\times\frac{lb\cdot mol}{379.4\,scf}\times\frac{10^6\,Btu}{MM\,Btu}\times\frac{64\,lb\,SO_2}{lb\cdot mol}\times\frac{scf}{1200\,Btu}=0.0056\frac{lb}{MM\,Btu}$$

S-33-408-0 (VGO Feed and Fractionation Heaters)

Pollutant	Emissions Factor	Source
NO_x	5 ppmv @ 3% O_2	Proposed, Achieved in Practice BACT
SO_x	0.0056 lb/MM Btu	Refinery Fuel Gas Sulfur Limit by Mass Balance
PM_{10}	0.0076 lb/MM Btu	AP-42 Chapter 1.4 (07/98)
CO	50 ppmv @ 3% O_2	Proposed, Technologically Feasible BACT
VOC	0.0054 lb/MM Btu	AP-42 Chapter 1.4 (07/98)

S-33-409-0 (SWAATS)

Pollutant	Emissions Factor	Source
SO_x	30 ppmv @ 0% O_2	Engineering Design Value
CO	100 ppmv@ 0% O_2	Engineering Design Value
VOC	1.36 lb/hr	Engineering Design Value

S-33-410-0 (FCCU)

Pollutant	Emissions Factor	Source
NO_x	20 ppmv @ 0% O2 (365 day rolling average) and 40 ppmv @ 0% O2 (7 day rolling average	Proposed, Technologically Feasible BACT
SO_x	20 ppmv @ 0% O2 (365 day rolling average) and 50 ppmv @ 0% O2 (7 day rolling average)	Proposed, Technologically Feasible BACT
PM_{10}	0.3 lb/l,000 lb of coke burned	Proposed, Technologically Feasible BACT
CO	50 ppmv @ 0% O2 (365 day rolling avg) and 78 ppmv @ 0% O2 (7 day rolling average)	Proposed, Technologically Feasible BACT
VOC	10 ppmwt	Proposed

Ground Level Flare (S-33-413-0)

Pollutant	Emissions Factor	Source
NO_x	0.068 lb/MM Btu	District Policy FYI-83
SO_x	0.0056 lb/MM Btu	Pilot Gas Sulfur Limit by Mass Balance
SO_x	0.04691 lb/MM Btu	Composite Gas Sulfur Limit by Mass Balance During Startup and Shutdown (160 ppmv S, assuming a blend of 300 Btu/scf gas (69.6% by vol) and 1200 Btu/scf gas (30.4% by vol)).
PM_{10}	0.008 lb/MM Btu	District Policy FYI-83
CO	0.370 lb/MM Btu	District Policy FYI-83
VOC	0.063 lb/MM Btu	District Policy FYI-83

Cooling Towers

S-33-415-0 and S-33-414-0 (Induced Draft, Evaporative Cooling Towers)

Pollutant	Emissions Factor	Source
PM_{10}	0.08345 lb/MM Gal*	Calculated, assuming a design drift of 0.0005% and TDS of 2000 ppmwt
VOC	0.7 lb/MM Gal	Proposed, from emissions inventory data

$$* \frac{2000\,lbs\ TDS}{10^6\ lbs\ H2O} \times \frac{8.345\,lb}{gal} \times \frac{5\,gal}{10^6\ gal} = 0.08345 \frac{lb}{MM\ gal}$$

C. Emission Calculations

1. Pre-Project Potential to Emit (PE1)

As all units proposed in this project are new emissions units, the PE1 = 0 lb/day for each unit for all criteria pollutants.

2. Post Project Potential to Emit (PE2)

Post project daily and annual emissions for each proposed permit unit are summarized in the tables below. Emissions calculation spreadsheets showing daily, annual, quarterly emissions are included as ***Appendix C***.

PE2 (lb/day)						
Permit Unit	NO_X	SO_X	PM_{10}	CO	VOC_{point}	VOC_{fug}
S-33-407-0	93.4	86.2	114.6	113.7	83.1	15.3
S-33-408-0 (35MM Btu/hr)	5.1	4.7	6.3	31.1	4.5	65.6
S-33-408-0 (47 MM Btu/hr)	6.8	6.3	8.4	41.7	6.1	N/A
S-33-409-0	0.0	44.2	0.0	64.4	32.6	N/A
S-33-410-0	404.0	703.1	133.2	3074.5	66.7	39.4
S-33-411-0	31.3	28.9	38.4	38.1	27.9	50.1
S-33-413-0	158.2	100.3	60.5	860.6	146.5	6.9
S-33-415-0	0.0	0.0	1.8	0.0	15.1	N/A
S-33-416-0	0.0	0.0	1.8	0.0	15.1	N/A
Totals	698.8	973.7	365.0	4224.1	397.6	177.3

PE2 (lb/yr)						
Permit Unit	NO_X	SO_X	PM_{10}	CO	VOC_{point}	VOC_{fug}
S-33-407-0	34091	31463	41829	41501	30332	5585
S-33-408-0 (35MM Btu/hr)	1862	1716	2300	11352	1643	23944
S-33-408-0 (47 MM Btu/hr)	2482	2300	3066	15221	2227	N/A
S-33-409-0	0	16133	0	23506	11899	N/A
S-33-410-0	73716	102561	48618	112176	24358	14381
S-33-410-0 (startup heater)	431	20	27	263	19	0
S-33-411-0	11425	10549	14016	13907	10184	18287
S-33-413-0	1941	396	228	10563	1799	2519
S-33-415-0	0	0	657	0	5512	N/A
S-33-416-0	0	0	657	0	5512	N/A
Totals	125948	165138	111398	228489	93485	64716

3. Pre-Project Stationary Source Potential to Emit (SSPE1)

Pursuant to Section 4.9 of District Rule 2201, the Pre-Project Stationary Source Potential to Emit (SSPE1) is the Potential to Emit (PE) from all units with valid Authorities to Construct (ATC) or Permits to Operate (PTO) at the Stationary Source and the quantity of emission reduction credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions that have occurred at the source, and which have not been used on-site.

The District and the applicant agree that the facility has pre project emissions potentials above the offset and Major Source thresholds levels for all criteria pollutants; therefore, SSPE1 calculations are not necessary.

4. Post Project Stationary Source Potential to Emit (SSPE2)

Pursuant to Section 4.10 of District Rule 2201, the Post Project Stationary Source Potential to Emit (SSPE2) is the Potential to Emit (PE) from all units with valid Authorities to Construct (ATC) or Permits to Operate (PTO) at the Stationary Source and the quantity of emission reduction credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions that have occurred at the source, and which have not been used on-site.

The District and the applicant agree that the facility has post-project emissions potentials above the offset and Major Source thresholds levels for all criteria pollutants; therefore, SSPE2 calculations are not necessary.

5. Major Source Determination

Pursuant to Section 3.25 of District Rule 2201, a major source is a stationary source with post-project emissions or a Post Project Stationary Source Potential to Emit (SSPE2), equal to or exceeding one or more of the following threshold values. However, Section 3.25.2 states, "for the purposes of determining major source status, the SSPE2 shall not include the quantity of emission reduction credits (ERC) which have been banked since September 19, 1991 for Actual Emissions Reductions that have occurred at the source, and which have not been used on-site.

The District and the applicant agree that the facility has pre project emissions potentials above the Major Source thresholds levels for all affected pollutants. As this project increases the potentials for all pollutants, the facility will remain above all Major Source threshold levels.

6. Baseline Emissions (BE)

This project proposes the installation of new emissions units only. Baseline emissions for new units are 0 lb/day for all pollutants.

7. Major Modification

As defined in 40 CFR 51.165 (in effect on December 19, 2002), a Major Modification means any physical change in or change in the method of operation of a Major Stationary Source that would result in a significant net emissions increase (NEI) of any pollutant subject to regulation under the Act. For administrative purposes the "Clean Fuels Project" has been assigned three District project numbers: S1061149, S1062741, and S1062742. All three of these District "projects" are considered one project for Major Modification and Federal Major Modification purposes.

The significance levels for all non-attainment pollutants and their precursors are listed in the table below. Also listed are the net emissions increases for each District project, and the total for the Clean Fuels Project. As shown below, the Clean Fuels Project is a major modification for NOx, SOx, PM10, and VOC.

Major Modification Net Emission Increases (NEI)

Pollutant	Threshold (lb/year)	S1061149 (lb/year)	S1062741 (lb/year)	S1062742 (lb/year)	Clean Fuels Project (lb/year)	Major Mod ?
NO_X	50,000	125,948	0	1,623	**127,571**	Yes
SO_X	80,000	165,138	0	3	**165,141**	Yes
PM_{10}	30,000	111,398	0	51	**111,449**	Yes
VOC	50,000	158,201	5,812	34,968	**198,981**	Yes

8. Federal Major Modification

As discussed above in VII C. 7., the project is a major modification. Major modifications are also federal major modifications unless they meet the criteria in either 3.17.1 ("Less Than Significant Emissions Increase Exclusion") or 3.17.2 ("Plantwide Applicability Limit" (PAL)).

Qualifying under the exclusion set forth in 3.17.1 is not possible as the emissions increases from the project are significant, i.e., there are no emissions decreases from existing equipment and the emissions increases from the new equipment alone are significant in that they exceed the threshold values set forth in Table 3-1.

Qualifying under the exclusion in set forth in 3.17.2 is not possible as the facility is not currently subject to a PAL for any regulated pollutant for the source (Area's 1 and 2 combined).

The project, therefore, results in a federal major modification.

9. Quarterly Net Emissions Change (QNEC)

The QNEC is calculated solely to establish emissions that are used to complete the District's PAS emissions profile screen. Detailed QNEC calculations are included in ***Appendix C***.

VIII. Compliance

Rule 1080 Stack Monitoring

This rule grants the APCO the authority to request the installation, use, maintenance, and inspection of continuous monitoring equipment. The general, source and pollutant specific requirements for continuous monitoring equipment are defined. This rule also specifies the performance standards for the equipment and administrative, recordkeeping, reporting, and violation and equipment breakdown notification requirements.

In addition to the authority granted under this rule, continuous emissions monitoring or alternate emissions monitoring is required for NO_x, CO and O_2 by Rules 4305 and 4306. NSPS Subpart J requires continuous monitoring of the fuel gas H_2S content for fuel gas combustion devices (including flares) and continuous monitoring of opacity and stack emissions of SO_x and CO for FCCU units.

In addition to the requirements set forth in Rules 4305 and 4306 and Supart J of the NSPS, the District will require continuous monitoring of NOx, CO and O_2 for those units that will be equipped with SCR.

Rule 1081 Source Sampling

The purpose of this rule is to ensure that any source operation that emits or may emit air contaminants provides adequate and safe facilities for use in sampling to determine compliance. This rule also specifies methods and procedures for source testing, sample collection, and compliance determination.

The permittee has proposed to install adequate and safe sampling facilities and to employ the specified source testing and sampling methods and procedures required by the rule. Compliance with this rule is expected.

Rule 2201 New and Modified Stationary Source Review Rule

A. Best Available Control Technology (BACT)

1. BACT Applicability

BACT requirements are triggered on a pollutant-by-pollutant basis and on an emissions unit-by-emissions unit basis. Unless exempted pursuant to Section 4.2, BACT is required for any new emissions unit with a potential to emit exceeding two pounds per day. Only new emissions units are proposed in this project.

As shown in the emissions calculation section of this evaluation, the flare, FCCU, and each process heater proposed in this project will have daily PEs for each affected pollutant exceeding 2.0 lb/day. The SWAATS unit will only have daily PEs for SO_2, CO and VOC exceeding 2.0 lb/day. The cooling towers will only have daily PEs for PM_{10} and VOC exceeding 2.0 lb/day. Further, the exemption for CO emissions set forth in Section 4.2.1 is not applicable, as the SSPE2 for CO exceeds 200,000 lb/yr. (The SSPE2 for CO has not been calculated, but CO emissions for the project alone exceed 200,000 lb/yr.) Therefore, BACT is required for VOC, NOx, SOx, PM10 and CO for the flare, FCCU, and each process heater. For the SWAATS, BACT is required for SO_x, VOC and CO, and for the cooling towers, BACT is required for PM_{10} and VOC.

BACT is also required for fugitive components, as the cumulative VOC emissions from these components will exceed 2.0 lb/day.

2. BACT Guidelines

Copies of the applicable BACT guidelines from the District BACT Clearinghouse are included as ***Appendix D***.

Fugitive Components

BACT Guidelines 7.2.2 (Petroleum Refining – Valves and Connectors) and 7.2.3 (Petroleum Refining – Pump and Compressor Seals) apply to the fugitive components being installed in this project.

Refinery Process Heaters

BACT Guidelines 1.8.1 (Process Heater – Refinery ≤ 50 MM Btu/hr) and 1.8.2 (Process Heater – Refinery > 50 MM Btu/hr) apply to the process heaters being installed in this project. Guidelines 1.8.1 and 1.8.2 have been revised in this project to address BACT for carbon monoxide and to include the most current technologies and emissions limits for NOx.

Refinery Flare, FCCU, SWATTS

New BACT guidelines for refinery flare (1.4.8), Catalyst Regeneration FCCU (7.2.8) and SWATTS (7.2.9) were developed for this project and have been added to the District's BACT Clearinghouse.

Cooling Towers

BACT Guideline 7.2.1 (Petroleum Processing/Gas Processing – Induced Draft Cooling Tower applies to the two cooling towers being installed in this project.

3. Top-Down BACT Analysis

A top-down BACT analysis was conducted for each new emissions unit proposed in this project, in accordance with the procedures established in the District's BACT Policy. This top-down analysis identified emissions controls and limits that satisfied BACT requirements and that will be required for this project. The applicant has proposed emissions controls and limits that were identified as BACT.

The top down BACT evaluation required for the equipment proposed in this project is included as ***Appendix E***. The emissions controls and emissions limits identified as BACT and required for this project are summarized below:

Fugitive Components

VOC: Leak defined as 100 ppmv above background (valves and connectors) or 500 ppmv above background (compressor and pump seals), when measured at distance of 1 cm from the source, and adoption of Inspection and Maintenance Program meeting the requirements of District Rule 4455.

Cooling Towers

VOC: Hydrocarbon detection device in tower with repair of leaks in heat exchangers within15 days of detection (88% control)
PM_{10}: Cellular Type Drift Eliminators (75 % control)

Refinery Heaters (≤ 50 MM Btu/hr)

VOC: Good Combustion Practices
NO_x: 5 ppmv @ 3% O2 (Low NOx burners and SCR)
SO_x: Treated Refinery Gas w/ no more than 40 ppmv Total Reduce Sulfur
CO: 50 ppmv @ 3% O2 (Good Combustion Practices with Ultra Low NOx Burners)
PM_{10}: Treated Refinery Gas with no more than 40 ppmv Total Reduced Sulfur

Refinery Heaters (> 50 MM Btu/hr)

VOC: Good Combustion Practices
NO_x: 5 ppmv @ 3% O2 (Low NOx burners and SCR)
SO_x: Treated Refinery Gas w/ no more than 40 ppmv Total Reduce Sulfur
CO: 10 ppmv @ 3% O2 (Good Combustion Practices with SCR)
PM_{10}: Treated Refinery Gas with no more than 40 ppmv Total Reduced Sulfur

FCCU

VOC: Good Combustion Practices

NO_x: 20 ppmv @ 0% O2 (365 day rolling average, excluding downtime) and 40 ppmv @ 0% O2 (7 day rolling average, excluding downtime) During startup/shutdown events, operator must comply with a District approved set of workplace practices.

SO_x: 20 ppmv @ 0% O2 (365 day rolling average, excluding downtime) and 50 ppmv @ 0% O2 (7 day rolling average, excluding downtime)

CO: 78 ppmv @ 0% O2 (30 day rolling avg, excluding downtime) and 50 ppmv @ 0% O2 (365 day rolling average, excluding downtime). During startup/shutdown events, operator must comply with a District approved set of workplace practices

PM_{10}: 0.3 lb PM_{10}/1,000 lb of coke burned off (Pall Corporation High Temperature Filter)

<u>SWAATS</u>

SO_x: Oxidation of sulfur compounds to SO_2 by combustion and catalytic reactor followed by SO_2 scrubbing achieving greater than 95% conversion andremoval of sulfur compounds and an exhaust concentration not exceeding 30 ppmvd SO_2 @ 0% O_2

CO: Efficient combustion of sour water stripper off-gas (SWSG) contactors exhaust

VOC: Incineration of SWSG contactors exhaust

B. Offsets

1. Offset Applicability

Pursuant to Section 4.5.3, offset requirements shall be triggered on a pollutant by pollutant basis and offsets shall be required if the Post Project Stationary Source Potential to Emit (SSPE2) equals or exceeds the offset threshold levels in Table 4-1 of Rule 2201.

The District and the applicant agree that emissions potential of the Big West Stationary Source for each affected pollutant exceeds the respective offset threshold level for that pollutant, and offsets shall be required for each affected pollutant for the emissions increases proposed in this project.

2. Quantity of Offsets Required

Per Sections 4.7.1 and 4.7.3, the quantity of offsets in pounds per year for each affected pollutant are calculated as follows for sources with an SSPE1 greater than the offset threshold levels before implementing the project being evaluated.

Offsets Required (lb/year) = (Σ[PE2 – BE] + ICCE) x DOR, for all new or modified emissions units in the project,

Where,
PE2 = Post Project Potential to Emit, (lb/year)
BE = Baseline Emissions, (lb/year)
ICCE = Increase in Cargo Carrier Emissions, (lb/year)
DOR = Distance Offset Ratio, determined pursuant to Section 4.8

Noting that there is no increase in cargo carrier emissions associated with this project and that baseline emissions are 0 lb/year for each unit; the quantity of offset required (lb/yr) for the new emissions units in the project is = (Σ PE2) x DOR. The applicant has also proposed to offset PM_{10} emissions increases using NO_x emission reductions at a ratio of 2.16 to 1.0. The proposal from Big West to use NOx to offset PM_{10} has been found to satisfy the requirements set forth in Rule 2201, Section 4.13.3. A discussion of the use of interpollutant offsets is included below.

Shown below are the emissions increases (Σ PE2), the DOR and the offset quantities required for this project, and the ERC certificates that the applicant has proposed to surrender. Except for PM_{10}, for which interopollutant offsets are being used, the certificates represent emissions reductions generated at the same stationary source, and will, therefore, be used at DOR of 1.0 to 1.0.

NOx Offset Quantities and Proposed ERC (lb/qtr)				
	Q1	Q2	Q3	Q4
Distance Offset Ratio	1.0	1.0	1.0	1.0
Σ PE2	31,488	31,488	31,488	31,488
Σ PE2 x DOR	31,488	31,488	31,488	31,488
ERC S-2183-2	219,700	222,089	224,530	224,530
Credits Remaining	188,212	190,601	193,042	193,042

PM_{10} Offset Quantities and Proposed ERC (lb/qtr)				
	Q1	Q2	Q3	Q4
Interpollutant Offset Ratio	2.16	2.16	2.16	2.16
Σ PE2	36,668	36,668	36,668	36,668
Σ PE2 x IOR	79,203	79,203	79,203	79,203
ERC S-2183-2[1]	188,212	190,601	193,042	193,042
Credits Remaining	109,009	111,398	113,839	113,839

1. Amounts remaining after subtracting NOx requirements.

SO_x Offset Quantities and Proposed ERC (lb/qtr)				
	Q1	Q2	Q3	Q4
Distance Offset Ratio	1.0	1.0	1.0	1.0
Σ PE2	41,284	41,284	41,284	41,284
Σ PE2 x DOR	41,284	41,284	41,284	41,284
ERC S-2177-5	55,479	65,755	62,724	69,141
ERC S-2184-5	5,548	5,771	4,951	5,990
Credits Remaining	19,743	30,242	26,391	33,847

CO Offset Quantities and Proposed ERC (lb/qtr)				
	Q1	Q2	Q3	Q4
Distance Offset Ratio	1.0	1.0	1.0	1.0
Σ PE2	57,123	57,123	57,123	57,123
Σ PE2 x DOR	57,123	57,123	57,123	57,123
ERC S-2183-2	2,332,706	2,358,625	2,384,544	2,384,544
Credits Remaining	2,275,583	2,301,502	2,327,421	2,327,421

VOC Offset Quantities and Proposed ERC (lb/qtr)				
	Q1	Q2	Q3	Q4
Distance Offset Ratio	1.0	1.0	1.0	1.0
Σ PE2	39,552	39,552	39,552	39,552
Σ PE2 x DOR	39,552	39,552	39,552	39,552
ERC S-2185-1	59,372	60,236	60,677	60,578
Credits Remaining	19,820	20,684	21,125	21,026

As seen above, the facility has sufficient credits to fully offset the emissions increases associated with this project.

3. Interpollutant Offsets

The applicant is proposing the use of the oxides of nitrogen (NO_x) to offset the PM_{10} emissions.

As set forth in 4.13.3, the use of interpollutant offsets may be allowed by the APCO on a case-by-case basis provided the applicant demonstrates that the proposed emissions increase will not cause or contribute to a violation of an Ambient Air Quality Standard. The APCO, in allowing the use of interpollutant offsets, shall base his approval on an air quality analysis and shall impose an offset ratio equal to or greater than that required by this rule. Emissions of PM_{10} may be offset by PM_{10} precursors. As defined in Section 3.30, nitrogen oxides emissions are a precursor to the nitrate fraction of PM_{10}.

The District has demonstrated through ambient air quality monitoring that the authorized PM_{10} emissions increase from the Big West Clean Fuels project are below the EPA daily and annual levels of significance, as referenced in 40 CFR Part 51.165 (b)(2), and will, therefore, not contribute to a violation of the 24-hour or annual ambient air quality standards for PM_{10}.

Big West has proposed an interpollutant offset ratio of 2.16 lb NO_x to offset 1.0 lb of PM_{10}. This District has determined that this ratio of NO_x to offset PM_{10} is appropriate for any project being approved in Kern County, and has prepared a general analysis showing how this ratio was determined. A copy of the District's general analysis is included as ***Appendix F***.

The general offset analysis uses the Chemical Mass Balance (CMB) model results prepared by the District using inputs from the Bakersfield, Golden State Avenue Monitoring Site for the period February 2000 through January 2001 and emissions inventory information from 1999. From the CMB modeling data, the analysis determined that the NOx to PM_{10} ratio is equivalent to the ratio of the organic carbon PM concentration to the ammonia nitrate PM concentration, normalized to the respective inventory values of organic carbon PM10 and NOx.

C. Public Notification

1. Applicability

Public noticing is required for any of the following:

a. Any new Major Source, which is a new facility that is also a Major Source,
b. Major Modifications,
c. Any new emissions unit with a Potential to Emit greater than 100 pounds during any one day for any one pollutant,
d. Any project which results in the offset thresholds being surpassed, and/or
e. Any project with an SSIPE of greater than 20,000 lb/year for any pollutant.

As a Major Modification, this project requires public noticing. In addition, the project authorizes emissions increases of more than 100 lb/day for several new emissions units and emissions increases of more than 20,000 lb/yr for the stationary source for all affected pollutants.

A public notice will be published in a local newspaper of general circulation prior to the issuance of the approvals for the proposed equipment. The public notice documents will also be submitted to the California Air Resources Board (CARB), EPA and, upon request, to interested parties.

D. Daily Emission Limits (DELs)

Daily Emissions Limitations (DELs) and other enforceable conditions are required by Section 3.17 to restrict a unit's maximum daily emissions to a level at or below the emissions associated with the maximum design capacity. Per Sections 3.17.1 and 3.17.2, the DEL must be contained in the latest ATC and contained in or enforced by the latest PTO, in a practicable manner, on a daily basis. Emissions limitations are also required to enforce the employment of BACT.

DELs have been added as enforceable permit conditions for each permit unit approved in this project.

E. Compliance Assurance

Guidance from the District Policy APR1795, *Source Testing Frequency* was followed in establishing the source test requirement below.

1. Source Testing

HGU, Isostripper Reboiler and Process Heaters

NOx, CO and O_2

Source testing shall be in accordance with the requirements set forth in is District Rule 4306, which requires source testing not less than once every 12 months. If the units demonstrate compliance on two consecutive compliance source tests may defer the following source test for up to thirty-six months.

Ammonia

For the units equipped with SCR and ammonia injection, an annual source test for ammonia slip will be required.

PM_{10}

For the units equipped with SCR and ammonia injection, an initial source test for PM_{10} will be required.

Fuel Sulfur

Initially, once per week for a period of six weeks, and thereafter, once every 6 months, the operator is required to obtain and analyze a representative sample for total reduced sulfur of the fuel combusted in these units.

FCCU Regenerator

Annual source testing for NO_x, SO_x, CO, PM_{10} and VOC will be required for the FCCU.

SWAATS Unit

The SWAATS vent will be tested annually to demonstrate compliance with SO_x, CO and VOC emissions limits.

Flare

Initially, once per week for a period of six weeks, and thereafter, once every 6 months, the operator will be required to obtain and analyze a representative sample for total reduced sulfur of each non-regulated fuel combusted in the flare pilot. The pilot will be monitored continuously for H_2S.

During each startup/shutsdown and emergency event, a sample of the gas combusted in the flare will be pulled and analyzed for total sulfur content and heat content (hhv).

Cooling Towers

The total dissolved solids (TDS) content will be determined weekly by pulling and evaluating a sample of the blowdown water.

2. Monitoring

Process Heaters

S-33-407-0 (HGU2) and S-33-411-0 (Isostripper Reboiler)

These units will have SCR catalysts for the control of NO_x, and will be equipped with continuous emissions monitors (CEMs) for NO_x and CO and continuous monitoring for

O_2. Along with emissions testing requirements set forth above, the proposed CEMs for these process heaters will satisfy the requirement to demonstrate on going compliance with NSR emission limitations. The CEMs also satisfy the monitoring requirements of Rule 4306. A second NO_x monitor will be installed in the exhaust duct ahead of the SCR unit to record emissions concentrations. Using the upstream and downstream NO_x monitors it will be possible to determine the NO_x reduction across the catalyst, which, along with the ammonia injection and exhaust flow rates, will be used to determine compliance with ammonia slip emissions on an ongoing basis. For all Clean Fuels project process equipment that combust refinery fuel gas, including the flare, the H_2S content will be continuously monitored in accordance with the requirements set forth in Rule 4001, Subpart J. The refinery fuel gas supplied to these units will be sampled and analyzed for total sulfur initially, once per week for a period of six weeks, and at least once every 6 months thereafter.

S-33-408-0 (VGO Feed and Fractionation Heaters)

These units will have ultra low NOx burners for the control of NO_x, and the operator will employ monthly monitoring using a portable emissions monitor to demonstrate ongoing compliance with NO_x and CO emissions limits. Along with emissions testing requirements set forth above, the proposed alternate monitoring of emissions using portable emissions monitors will satisfy the requirement to show compliance with NSR emission limitations. The proposed alternate monitoring scheme also satisfies the monitoring requirements of Rule 4306.

S-33-409-0 (SWAATS)

On the SWAATS, SO_2 will be continuously monitored indirectly by continuously monitoring the pH of the SO_2 absorber vent wash. During the initial compliance test for the SWAATS, the permittee will be required to establish the range of pH values of the absorber vent wash that correlates with SO_2 exhaust emissions that are less than or equal to the SO_2 permit.

S-33-410-0 (FCCU)

The FCCU will have SCR catalyst for the control of NO_x, and will be equipped with continuous emissions monitors (CEMs) for NO_x and CO. The FCCU will be equipped with a CEM for monitoring SO_x and an opacity monitor to satisfy Rule 4001, Subpart J requirements. Together with annual emissions testing, the proposed CEMs for the FCCU will satisfy the requirement to demonstrate on-going compliance with NSR emission limitations. A second NO_x CEM will be installed in the exhaust duct ahead of the SCR unit to record emissions concentrations. Using the upstream and downstream NO_x monitors it will be possible to determine the NO_x reduction across the catalyst, which, along with the ammonia injection rate, will be used to calculate ammonia slip and determine compliance with the ammonia slip emissions limit on a continuous basis.

S-33-413-0 (Multi-point, Ground Level Flare)

Except natural gas supplied from a regulated source, pilot gas will be continuously monitored for H_sS in accordance with Subpart J requirements. Gas burned in the flare during startup/shutdown or emergencies will be sampled and tested for total sulfur and heating value during each event. Individual flow rate monitors will be installed to record the quantities of flare gas and pilot gas combusted.

S-33-415-0 and S-33-414-0 (Forced Draft Cooling Towers)

To determine compliance with the PM_{10} emissions limit, the permittee will monitor the water circulation rate (gpm) and the total dissolved solids concentration (TDS, mg/liter) in the blowdown water.

To determine compliance with the VOC emissions limit, the permittee will install a monitoring system to identify the presence of hydrocarbon leaks into the cooling water. This monitoring system will be either a LEL/VOC monitor at the draft fan exhaust, a monitor of oxidation/reduction potential of the cooling water, or other monitoring approved by the District.

3. Recordkeeping

Recordkeeping is required to demonstrate compliance with the offset, public notification and daily emission limit requirements of Rule 2201.

To satisfy Rule 2201 requirements, the permittee will be required to submit records of all source tests and maintain records of emissions monitoring, amounts of fuel and waste gas combusted, fuel sampling for sulfur and BTU content, ammonia use and operational parameters such as catalyst temperature and flue gas mass and/or volumetric flowrates.

Records shall be maintained, retained on-site for a period of at least five years and made available for District inspection upon request.

4. Reporting

No reporting is required to demonstrate compliance with Rule 2201.

F. Ambient Air Quality Analysis

Section 4.14.2 of this Rule 2201 requires that an ambient air quality analysis (AAQA) be conducted for the purpose of determining whether a new or modified Stationary Source will cause or make worse a violation of an ambient air quality standard. The Risk Management Review for this project, which includes the AAQA, was prepared by the District's Technical Services Division and is attached as ***Appendix G***.

The proposed location for the Clean Fuels Project is in an attainment area for NO_X, CO, SO_X and PM_{10}. As shown below in the AAQA summary table, the proposed equipment will not cause or contribute significantly to a violation of the State or National ambient air quality standards.

Criteria Pollutant Modeling Results*
Values are in μg/m^3

Pollutant	Avg Per	Max Imp.	Back Conc.	Total Conc.	CAAQS	NAAQS	Significance Impact Level
NOx	1h	195.42	138.95	334.37	470	N/A	-
	Ann	0.96	33.80	34.76	N/A	100	-
CO	1h	122.19	3,772.8	3894.99	23,000	40,000	-
	8h	32.90	2,515.4	2548.30	10,000	10,000	-
SOx	1h	86.11	78.44	164.55	655	N/A	-
	3h	86.11	39.22	125.33	N/A	1300	-
	24h	1.86	13.07	14.93	105	365	-
	Ann	0.42	5.23	5.65	N/A	80	-
PM10	24h	1.18[1]	Non attainment	1.18	-	-	5
	Ann	0.44[1]	Non attainment	0.44	-	-	1

[1]The criteria pollutants are below EPA's level of significance as found in 40 CFR Part 51.165 (b)(2).

G. Compliance Certification

Section 4.14.3 of this Rule requires that the owner of a source undergoing a major modification to demonstrate to the satisfaction of the District that all other major sources owned by such person and operating in California are in compliance or are on a schedule for compliance with all applicable emission limitations and standards. As this project constitutes a major modification, this requirement compliance certification is applicable. Big West of California LLC has submitted the required compliance certification, a copy of which is included as ***Appendix H***.

Rule 2520 Federally Mandated Operating Permits

This facility (S-33 and S-34) is subject to this rule, and has received a Title V Operating Permit. The proposed modification is a significant permit modification to the Title V Permit pursuant to Section 3.29 of this rule. As discussed above, the facility has applied for a Certificate of Conformity (COC) to be issued with the Authority to Construct. When issued, the Authority to Construct with Certificate of Conformity will serve as the final Part 70 permit amendment issued by the District for the requested modifications. The facility will apply to modify their Title V permit with an administrative amendment prior to operating with the proposed modifications.

Continued compliance with this rule is expected.

Rule 4001 New Source Performance Standards

This rule incorporates the New Source Performance Standards from Part 60, Chapter 1, Title 40, Code of Federal Regulations (CFR).

Subpart A General Provisions

§60.18 General Control Device Requirements

This section establishes the general control device requirements for flares.

Ground Level Flare (S-33-413-0)

The §60.18 requirements apply to the multi stage, multi-burner ground level flare proposed for the Clean Fuels project. To satisfy the requirements of §60.18, a flare shall be steam-assisted, air-assisted or non-assisted. The ground level flare is an air-assisted and pressure-assisted flare and will be subject to the requirements listed below.

- The heating value of the gas combusted must be equal to or exceed 300 Btu/scf.
- The flare must be designed and operated with an exit velocity less than 60 ft/sec; or, if the heating value of the gas combusted is greater than 1,000 Btu/scf, must be designed and operated with an exit velocity equal to or greater than 60 ft/sec but less than 400 ft/sec; or must be designed and operated with an exit velocity less than the velocity V_{mva}, as determined by the method specified in paragraph (f)(5), and less than 400 ft/sec.

The applicant intends to meet the above listed requirements by restricting the operation of the flare to non-routine events, i.e., the flaring of gas only during start-up, shutdown and the malfunction of process equipment. All routine gas releases will be handled by the flare gas recovery system and will be recycled to the refinery's fuel gas system. As NSPS requirements do not apply during startup, shutdown and during malfunctions, and as all other releases will be recycled, the flare is expected to comply with §60.18 requirements.

Subpart J – Standards of Performance for Petroleum Refineries

Subpart J requirements only apply to affected facilities that commence construction before May 14, 2008 (FCCU and process heaters) or before June 24, 2008 (flares). As the Clean Fuels Project equipment will be constructed after the applicability dates, Subpart J requirements do not apply to this equipment.

Subpart Ja – Standards of Performance for Petroleum Refineries

The provisions of this subpart are applicable to the following affected facilities in petroleum refineries: fluid catalytic cracking units (FCCU), fluid coking units, delayed coking units, fuel gas combustion devices, including flares and process heaters, and sulfur recovery plants.

<u>Process Heaters (S-33-407-0, '408-0 and '411-0 and 'Ground Level Flare (S-33-413-0)</u>

The below listed requirements of Subpart Ja are applicable to the subject process heaters and flare, as they are fuel gas combustion devices as defined in the rule.

§60.102a(g)(1)(ii) - The owner or operator shall not burn in any fuel gas combustion device any fuel gas that contains H_2S in excess of 162 ppmv determined hourly on a 3-hour rolling average basis and H_2S in excess of 60 ppmv determined daily on a 365 successive calendar day rolling average basis.

§60.102a(g)(2) - For each process heater with a rated capacity of 40 MM Btu/hr, the owner or operator shall not discharge to the atmosphere any emission of NO_x in excess of 40 ppmv (dry, corrected to 0% excess air) on a 24-hour rolling average basis.

§60.103a(b) - Each owner or operator that operates a fuel gas combustion device or sulfur recovery plant subject to this subpart shall conduct a root cause analysis of any emission limit exceedance or process start-up, shutdown, upset, or malfunction that causes a discharge to the atmosphere in excess of 227 kilograms per day (kg/day) (500 lb per day (lb/day)) of SO2. For any root cause analysis performed, the owner or operator shall record the identification of the affected facility, the date and duration of the discharge, the results of the root cause analysis, and the action taken as a result of the root cause analysis.

§60.104a(a) - The owner or operator shall conduct a performance test for each FCCU, sulfur recovery plant, and fuel gas combustion device to demonstrate initial compliance with each applicable emissions limit in §60.102a according to the requirements of §60.8. The notification requirements of §60.8(d) apply to the initial performance test and to subsequent performance tests required by paragraph (b) of this section (or as required by the Administrator), but does not apply to performance tests conducted for the purpose of obtaining supplemental data because of continuous monitoring system breakdowns, repairs, calibration checks, and zero and span adjustments.

§60.107a(2) - The owner or operator of a fuel gas combustion device subject to the H_2S concentration limits in §60.102a(g)(1)(ii) shall install, operate, calibrate, and maintain an instrument for continuously monitoring and recording the concentration by volume (dry basis) of H_2S in the fuel gases before being burned in any fuel gas combustion device.

§60.107a(d) - The operator shall install, operate, calibrate and maintain an instrument for continuously monitoring and recording the concentration of reduced sulfur in the flare gas. Instrument shall be installed, operated and maintained in accordance with Performance Specification 5 of Appendix B to Part 60.

§60.107a(e) - Mass or volumetric fuel flow meters to measure the amounts of flare gas and pilot gas combusted shall be installed, utilized and maintained. A fuel flow meter is not required to measure the pilot gas provided the pilot gas is from a regulated source and an alternate method for determining the amount of pilot gas combusted is approved by the APCO.

§60.103a(a) - Operator shall develop and implement a written flare management plan prior to first operation of this device. The plan shall include at a minimum, the items listed in 40 CFR 60.103a(a)(1) through (6).

FCCU (S-33-410-0)

The provisions of this subpart are applicable to the proposed FCCU. The emissions requirements listed below, or BACT emissions requirements that are more stringent, will be imposed on the permit. Based on FCCU design, the sulfur content of the incoming feed, and the control equipment proposed for this unit, compliance with the Subpart Ja emissions requirements is expected.

§60.102a(b) – From the FCCU, there shall be no discharge exceeding any of the following limits: particulate matter emissions in excess of 0.5 g/kg (0.5 lb/1000 lb) of coke burn-off, nitrogen oxides (NO_x) in excess of 80 ppmv, dry basis corrected to 0% excess air, on a 7-day rolling average basis, sulfur oxides (SO_2) in excess of 50 ppmv dry basis corrected to 0% excess air, on a 7-day rolling average basis and 25 ppmv dry basis corrected to 0% excess air, on a 365-day rolling average basis, or carbon monoxide (CO) in excess of 500 ppmv dry basis corrected to 0% excess air, on a hourly average basis.

§60.105a(e) – Each owner or operator of an FCCU that uses cyclones to comply with the PM emissions limit of 60.102a(b)(1) shall monitor the opacity of emissions according to the requirements listed in paragraphs (e)(1) through (3) of this section.

§60.105a(g) – The owner or operator subject to the emissions limits in 60.102a(b)(3) for an FCCU shall install, operate, calibrate and maintain an instrument for continuously monitoring and recording the concentration by volume (dry basis, corrected to O% O_2) of SO_2 into the atmosphere. The monitor shall include and O_2 monitor for correcting the data for excess air.

§60.105a(h) - The owner or operator shall install, operate, calibrate and maintain an instrument for continuously monitoring and recording the concentration by volume (dry basis) of CO for each FCCU subject to the emissions limit in 60.102a(b)(4).

SWAATS (S-33-409-0)

The SWAATS is not considered a sulfur recovery plant as defined in §60.101; and is therefore not an affected unit and not subject to the requirements of Subpart Ja. Sulfur recovery plant means all process units which recover sulfur from H_2S and/or SO_2 at a petroleum refinery. The SWAATS does not recovery sulfur, but rather ammonium thiosulfate in the form 60% solution in water.

Recordkeeping and Reporting Requirements

§60.108a(a) - Each owner or operator subject to the emissions limits in §60.102a shall comply with the notification, recordkeeping and reporting requirements in §60.7 and other requirements specified in this section.

Subpart GGG – Standards of Performance for Equipment Leaks of VOC at Petroleum Refineries (and by reference Subpart VV - Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry)

The provisions of this subpart apply to affected facilities in petroleum refineries. All compressors and the group of all the equipment within a process unit are affected facilities. In §60.591, equipment means each valve, pump, pressure relief device, sampling connection system, open-ended valve or line, and flange or other connector in VOC service. For the purposes of recordkeeping and reporting only, compressors are considered equipment.

To satisfy the standards of performance for equipment leaks of VOC at petroleum refineries, each owner or operator subject to the provisions of this subpart shall comply with the requirements of §§60.482–1 to 60.482–10 (Subpart VV) as soon as practicable, but no later than 180 days after initial startup.

The requirements set forth in §§60.482–1 to 60.482–10 will be listed as enforceable permit conditions. Test methods and procedures (§60.485), recordkeeping (§60.486) and reporting (§60.487) requirements will also be listed as enforceable permit conditions.

Compliance with Subpart GGG requirements is expected.

40 CFR Part 60 Subpart QQQ – Standards of Performance for VOC Emissions From Petroleum Refinery Wastewater Systems

Subpart QQQ applies to each individual drain system, oil-water separator, and aggregate facility (an individual drain system, together with ancillary down-stream sewer lines and oil-water separators, down to and including the secondary oil-water separator) at a petroleum refinery that is constructed, modified or reconstructed after May 2, 1987. Based on modifications made to the wastewater system at the Bakersfield refinery, the inlet sump and oil-water separators are already considered affected facilities under Subpart QQQ, and meet the equipment design, inspection and repair requirements under §§60.692 and 60.693.

The HGU2, VGO-HDS, SWAATS, FCCU and LPG/Merox process units will require new individual drain systems. Each of these drain systems will comply with the equipment design requirements under §60.692 (i.e., water seal controls for each drain, junction boxes equipped with tightly sealed covers, vent pipes at least 3 feet long with a diameter not greater than 4 inches, and sewer lines not open to the atmosphere). No new oil-water separators will be installed as part of the Clean Fuels Project. The proposed new drain systems will be subject to the initial certification and inspection requirements of Subpart QQQ.

Rule 4002 National Emission Standards for Hazardous Air Pollutants

NESHAP for Equipment Leaks (Fugitive Emission Sources) of Benzene (40 CFR Part 61, Subpart J)

Part 61, Subpart J applies to specific sources of fugitive emissions in "benzene service," which is defined to mean "that a piece of equipment either contains or contacts a fluid that is at least 10 percent benzene by weight." No piece of any proposed equipment will be in "benzene service", therefore Subpart J will not apply.

NESHAP for Equipment Leaks (Fugitive Emission Sources) (40 CFR Part 61, Subpart V)

Part 61, Subpart V applies to specific sources of fugitive emissions in "volatile hazardous air pollutant (VHAP) service," which is defined to mean "that a piece of equipment either contains or contacts a fluid that is at least 10 percent by weight a VHAP." VHAP is defined to include only benzene and vinyl chloride. No piece of any proposed equipment will be in "volatile hazardous air pollutant (VHAP) service"; therefore, Subpart V will not apply.

NESHAP for Benzene Waste Operations (40 CFR Part 61, Subpart FF)

Part 61, Subpart FF applies to all petroleum refineries (among other sources), regardless of the quantity of benzene processed. Refinery operators must determine the Total Annual Benzene (TAB) generated, as prescribed under §61.342(a). With the addition of the Clean Fuels Project, the TAB will exceed 10 Mg/yr, and the contiguous Area 1 and Area 2 facility will become subject to the Subpart FF work practice and emissions standards. The facility will be subject to the work practice and emissions standards of Subpart FF upon initial start-up of the new Clean Fuels Project components, and the refinery will comply with the provisions of §61.342(e) (i.e., maintain total benzene quantity (TBQ) less than 6 Mg/yr).

NESHAP for Source Categories (40 CFR Part 63)

Under the Clean Air Act Amendments of 1990, EPA was directed to establish NESHAP for specific classes or categories of sources with the potential to emit 10 or more tons/year of a single Hazardous Air Pollutant (HAP), or 25 tons/year of any combination of HAPs. This facility is not subject to the 40 CFR Part 63 NESHAPs, because its facility-wide potential to emit HAPs falls below the 10/25 thresholds. For the facility, HAP emissions are limited via a federally-enforceable permit condition to below threshold values. With the addition of the Clean Fuels Project units, HAP emissions will remain below the relevant thresholds.

Rule 4101 Visible Emissions

This rule limits the discharge to the atmosphere of emissions of any air contaminant, other than uncombined water vapor, for a period or periods aggregating more than three (3) minutes in any one (1) hour which is as dark or darker in shade as that designated as No. 1 on the Ringelmann Chart, as published by the United States Bureau of Mines.

The process heaters, FCCU and SWAATS scurbber vent have the potential for visible emissions. However, these units employ sophisticated combustion controls and stack monitoring, including an opacity monitor on the FCCU catalyst regenerator exhaust. These units are fired exclusively on refinery fuel gas that is limited to having no more than 100 ppmv total sulfur. These units are employ and.

The flare is expected to operate without smoke, based on it's multistage design and the use of air or steam assist to enhance combustion efficiency in the low pressure section. Visible emissions from the flare are required to be less than 5% in opacity, except for three minutes in any one-hour.

All units installed as part of the Clean Fuels Project are expected to have visible emissions less than Ringelmann No. 1 (20% opacity) at all times, expect for periods aggregating no more than 3 minutes in any one hour. Compliance with requirements of this rule is expected.

Rule 4102 Nuisance

Section 4.0 prohibits discharge of air contaminants that cause injury, detriment, nuisance or annoyance to the public. Public nuisance conditions are not expected as a result of these operations, provided the equipment is installed, operated and maintained as per the requirements set forth on the Authority to Construct permits. Therefore, compliance with this rule is expected.

California Health & Safety Code 41700 (Health Risk Assessment)

District Policy APR 1905 – Risk Management Policy for Permitting New and Modified Sources specifies that for an increase in emissions associated with a proposed new source or modification, the District perform an analysis to determine the possible impact to the nearest resident or worksite.

As the cumulative total facility prioritization score is greater than one, a health risk assessment was required to determine the short-term acute, long-term chronic exposure and maximum excess cancer risk from this project.

The District's Technical Services staff completed a risk management review (RMR) for the Clean Fuel Project, the results of which are summarized below. The complete RMR is included as ***Appendix G***.

CFP Cumulative RMR Summary (Rec. 4319)[1]	
Categories	**Facility Totals**
Prioritization Score	>1
Acute Hazard Index	7.89×10^{-2}
Chronic Hazard Index	1.11×10^{-2}
Maximum Individual Cancer Risk (10^{-6})	3.42

[1]Includes only the risk estimated for new and previously permitted units at facility S-33.

In accordance with the District's Risk Management Policy, APR 1905, the project is approvable, as the impact of the emissions increases from the project are below the significance levels, i.e., acute and chronic indices are below 1.0 and maximum individual cancer risk for the facility including the Clean Fuels Project is less than 10 in a million. Further, the project is approvable without Toxic Best Available Control Technology (T-BACT), as the maximum individual cancer risk for each permit unit is less than 1 in a million.

Rule 4201 Particulate Matter Concentration

Section 3.1 prohibits discharge of dust, fumes, or total particulate matter into the atmosphere from any single source operation in excess of 0.1 grain per dry standard cubic foot.

Process Heaters

The refinery fuel gas fired process heaters proposed in this project are expected to have PM_{10} emissions not significantly different than such units fired on natural gas fuel. An AP-42 natural gas PM_{10} emissions factor, 0.0076 lb/MM Btu, has been assumed for these units.

Based on the assumptions and calculation below, compliance is expected with Rule 4201 requirement that the particulate matter exhaust gas concentration not exceed 0.1 grain/dscf.

F-Factor for NG: 8,578 dscf/MMBtu at 60 °F
PM_{10} Matter Emission Factor: 0.0076 lb-PM10/MMBtu
Percentage of PM as PM10 in Exhaust: 100%
Exhaust Oxygen (O_2) Concentration: 3%
Excess Air Correction to F Factor = $\dfrac{20.9}{(20.9 - 3)}$ = 1.17

$$GL = \left(\frac{0.0076\ lb-PM}{MMBtu} \times \frac{7{,}000\,grain}{lb-PM}\right) / \left(\frac{8{,}578\ ft^3}{MMBtu} \times 1.17\right)$$

$$GL = 0.0053\ grain/dscf < 0.1\,grain/dscf$$

FCCU

The proposed FCCU is expected to have PM_{10} emissions not exceeding 3.6 lb/hr.

Based on the assumptions and calculation below, compliance is expected with the Rule 4201 requirement that the particulate matter exhaust gas concentration not exceed 0.1 grain/dscf.

Exhaust Flow:	9,146.8 lb.mol/hr (wet)
Moisture Content:	11.8%
Percentage of PM as PM10 in Exhaust:	100%

$$GL = \left(\frac{5.55\, lb\, PM_{10}\, /\, hr}{9{,}146.8\, lb.mol\, /\, hr} \times \frac{100\%}{(100\% - 11.8\%)} \times \frac{7{,}000\, grain}{lb - PM_{10}} \times \frac{lb.mol}{379.4\, dscf} \right)$$

$$GL = 0.008\ grain/dscf < 0.1\, grain/dscf$$

District Rule 4305 Boilers, Steam Generators and Process Heaters – Phase 2

The process heaters proposed in this project are refinery fuel gas-fired and each has a maximum heat input exceeding 5 MM Btu/hr. Pursuant to Section 2.0 of District Rule 4305, the proposed units are subject to District Rule 4305, *Boilers, Steam Generators and Process Heaters – Phase 2.*

In addition, the units are also subject to District Rule 4306, *Boilers, Steam Generators and Process Heaters – Phase 3.*

Since emissions limits of District Rule 4306 and all other requirements are equivalent or more stringent than District Rule 4305 requirements, compliance with District Rule 4306 requirements will satisfy requirements of District Rule 4305.

District Rule 4306 Boilers, Steam Generators and Process Heaters – Phase 3

This rule limits NO_x and CO emissions from gaseous and liquid fuel fired boilers, steam generators and process heaters having heat input ratings greater than 5 MM Btu/hr.

Section 5.1 – Emissions Requirements

Show in the table below are the "Clean Fuels Project" units that have Rule 4306 applicability, and the required and proposed emissions limits for each unit. The limits proposed by the applicant and approved by the District satisfy the rule.

Rule 4306 Unit Summary						
Permit Unit	Heat Input (MM Btu/hr)	Table 1 Category	NOx Limit ppmv @ 3% O_2		CO Limit ppmv @ 3% O_2	
			Req'd	Props'd	Req'd	Props'd
S-33-407-0 HGU2	614	F	5	5	400	10
S-33-408-0 Feed Htr	35	D	30	20	400	50
S-33-408-0 Fractionator Htr	47	D	30	20	400	50
S-33-411-0 Isostripper Boiler	215	F	5	5	400	10

Section 5.3, Startup and Shutdown Provisions

Section 5.3 states that the applicable emission limits shall not apply during start-up or shutdown provided an operator complies with the requirements specified in Sections 5.3.1 through 5.3.4.

The applicant has requested startup and shut down periods exceeding two hours in length, and has been approved for such, based on his satisfying the requirements set forth Section 5.3.3.

The applicant has provided, or is required to provide at least 30 days prior to the initial startup of any process unit, startup and shutdown plans for the unit being started up.

Section 5.4, Monitoring Provisions

Section 5.4.2 requires that permit units subject to District Rule 4306, Section 5.1 emissions limits shall either install and maintain Continuous Emission Monitoring (CEM) equipment for NO_X, CO and O_2, or install and maintain APCO-approved alternate monitoring.

Continuous emissions monitoring for NOx, CO and O_2 will be installed on HGU2 (S-33-407) and the isostripper boiler serving the VGO-HDS (S-33-411). Enforceable permit conditions specifying the requirements for the installation and operation of continuous emissions monitoring have been included on the draft permit for these refinery process heaters.

For the feed heater and fractionator feed heater serving the LPG Merox unit (S-33-411), the applicant has proposed to use of pre-approved alternate monitoring scheme A, the provisions of which are set forth in District Policy SSP-1105. Monitoring scheme A requires monitoring the NO_X, CO, and O_2 exhaust concentrations at least once per month using a portable analyzer. Enforceable permit conditions have been included on the draft permits for these refinery process heaters specifying the implementation of per-approved monitoring scheme A.

Section 6.3, Compliance Testing

Section 6.3.1 requires that the subject units be tested to determine compliance with the applicable requirements of section 5.1 and 5.2.3 not less than once every 12 months. Upon demonstrating compliance on two consecutive compliance source tests, the following source test may be deferred for up to thirty-six months.

An initial compliance source test for NOx, CO and O_2 is required to demonstrate compliance with NSR emissions limits within 60 days of initial startup for each of the proposed refinery process heaters.

Pursuant to District policy APR-1750, *Source Testing Frequency,* annual source testing is required for units equipped with SCR catalysts. Therefore, annual compliance source testing for NOx, CO and O_2 will be required for HGU2 (S-33-407) and the isostripper boiler serving the VGO-HDS (S-33-411). Enforceable permit conditions specifying the annual compliance source testing requirements have been included on the draft permits for these refinery process heaters.

Annual compliance source testing for NOx, CO and O_2 with the option to defer to once every 36 months will be required for the feed heater and fractionator feed heater serving the LPG Merox unit (S-33-411). Enforceable permit conditions specifying the annual, or once every 36-month, as appropriate, compliance source testing requirements have been included on the draft permit for these refinery process heaters.

Rule 4311 Flares

This rule is applicable to flares that are owned and operated by major sources.

Section 5.2 requires that a flame be present at all times when combustible gases are vented through the flare.

Section 5.3 requires that the flare outlet be equipped with an automatic ignition system, or, shall operate with a pilot flame present at all times when combustible gases are vented through the flare, except during purge periods for automatic-ignition equipped flares.

Section 5.4 requires the installation and operation of a heat sensing device such as a thermocouple, ultraviolet beam sensor, infrared sensor, or an equivalent device, capable of continuously detecting at least one pilot flame or the flare flame is present, except for flares equipped with a flow-sensing ignition system.

Section 5.5 requires that flares that use flow-sensing automatic ignition systems, and which do not use a continuous flame pilot, shall also use purge gas for purging.

Section 5.6 requires open flares, either air-assisted, steam-assisted, or non-assisted, that have flare gas pressures of less than 5 psig be operated in a manner that meets the provisions of 40 CFR 60.18. (Flares with operating pressures of 5psig or greater are not required by this rule to meet the provisions of 40 CFR 60.18. and do not have additional requirement beyond those listed below.)

As previously discussed, the ground level flare is a Subpart J affected facility and is therefore subject to the general control device requirements set forth in 40 CFR §60.18. These requirements apply regardless of the operating pressure of the flare.

The applicant intends to meet the 40 CFR §60.18 requirements by restricting the operation of the flare to non-routine events, i.e., the flaring of gas only during start-up, shutdown and the flaring due to malfunction of process equipment. All routine gas releases will be handled by the flare gas recovery system and will be recycled to the refinery's fuel gas system. As NSPS requirements do not apply during startup, shutdown and malfunction, and as all other releases will be recycled, the flare is expected to comply with §60.18 requirements.

As proposed, the flare meets all other applicable Rule 4311 requirements.

The flare will have a flame present at all times when gas is flowing to the flare. Each flare outlet will have either a pilot flame or the main flare flame present at all times. Each flare outlet will be equipped with a continuous pilot with automatic re-ignition of the pilot flame and a thermocouple to detect the presence of a flame.

District Rule 4351 Boilers, Steam Generators and Process Heaters – Phase 1

This rule applies to boilers, steam generators, and process heaters at NO_x Major Sources that are not located west of Interstate 5 in Fresno, Kings, or Kern counties. As Rule 4306 requirements are more stringent than those imposed by this rule, compliance is expected with Rule 4351 requirements is expected when the subject process heaters are operated in compliance with Rule 4306.

District Rule 4454 Refinery Process Unit Turnaround

This rule establishes requirements for the depressurization of process units prior to engaging in a turnaround of that unit. The operator has successfully followed process unit turnaround requirements for the units currently operated at the Big West refinery and is expected and required to adopt the same requirements for the "Clean Fuel Project" process units. These requirements are set forth below:

The operators shall not depressurize any vessel containing VOCs unless the process unit turnaround is accomplished by employing one of the following operating procedures: The organic vapors shall either be recovered, added to the refinery fuel gas system and combusted; or controlled and piped to an appropriate firebox or incinerated for combustion; or flared, until the pressure within the process vessel is as close to atmospheric pressure as is possible. All process vessels shall be depressurized into the control facilities to less than 1020 mm Hg (5 psig) before venting/opening to atmosphere. All organic compounds which emerge from a refinery process vessel during the purging of said vessel and which otherwise would be emitted to the atmosphere shall be either directed to a flare or incinerator or shall be used for fuel until such disposition of emissions is not technically feasible or is less safe than atmospheric venting.

District Rule 4455 Components At Petroleum Refineries, Gas Liquids Processing Facilities, And Chemical Plants

The purpose of this rule is to limit VOC emissions from leaking components at petroleum refineries, gas liquids processing facilities, and chemical plants. This rule establishes requirements for leak definition, leak detection and leak minimization requirements for all components that contain or contact VOC.

The operator has successfully implemented an operator management plan for the refinery for the current roster of components in VOC service. As required by this rule, the operator management plan submitted by Big West was reviewed and approved by the District. Big West is required to update the operator management plan to include the components in VOC service being added to implement the "Clean Fuels Project" and to submit the updated plan for District approval.

The essential requirement of the rule is that an operator not use any component that leaks in excess of the applicable leak criteria established by the rule, with the exception that leaking components may be used provided that they are identified with a tag for repair, are repaired, or are awaiting re-inspection after being repaired, within the applicable time period specified in this rule. Minor and major gas and liquid leaks are defined and leak standards are established for the following component types: flanges, valves, threaded connections, pumps, compressor, pressure relief devices, pipes and other. The rule establishes inspection, re-inspection and maintenance requirements for components.

To enforce this rule, the District has developed a standard set of permit conditions that set forth the requirements of the rule. This set of conditions will be included on the permit for each emissions unit having components in VOC service.

Compliance with this rule is expected.

District Rule 4801 Sulfur Compounds

A person shall not discharge into the atmosphere sulfur compounds, which would exist as a liquid or gas at standard conditions, exceeding in concentration at the point of discharge: 0.2 % by volume calculated as SO_2, on a dry basis averaged over 15 consecutive minutes. Using the ideal gas equation and the emission factors presented in Section VII, the sulfur compound emissions are calculated as follows:

$$\text{Volume } SO_2 = \frac{n\,RT}{P}$$

With:

N = moles SO_2
T (Standard Temperature) = 60°F = 520°R
P (Standard Pressure) = 14.7 psi
R (Universal Gas Constant) = $\frac{10.73\,\text{psi} \cdot \text{ft}^3}{\text{lb} \cdot \text{mol} \cdot {}^\circ\text{R}}$

Process Heaters (Refinery Fuel Gas Fired):

EPA F-Factor for Natural Gas: 8,710 dscf/MMBtu at 68 °F, equivalent to

$$Corrected\ F - factor = \left(\frac{8{,}710 dscf}{MMBtu}\right) \times \left(\frac{60^o F + 459.6}{68^o F + 459.6}\right) = 8{,}578 \frac{dscf}{MMBtu} \quad at \ \ 60^o F$$

Assuming a worst-case fuel sulfur of 160 ppmv as S (0.02250 lb/MM Btu as SO_x).

$$\frac{0.0225 lb - SOx}{MMBtu} \times \frac{MMBtu}{8{,}578 dscf} \times \frac{1 lb \cdot mol}{64 lb} \times \frac{10.73 psi \cdot ft^3}{lb \cdot mol \cdot {}^\circ R} \times \frac{520{}^\circ R}{14.7 psi} \times \frac{1{,}000{,}000 \cdot parts}{million} = 15.56 \frac{parts}{million}$$

$SulfurConcentration = 15.56 \frac{parts}{million}$ < 2,000 ppmv (or 0.2%)

FCCU:

The FCCU is limited to 20 ppmv SO_x @ 0% O2 (365 day rolling average) and 40 ppmv SO_x @ 0% O2 (7 day rolling average). Compliance with these requirements will be demonstrated with an exhaust stack continuous emissions monitoring system for SO_x. The aggressive hydrotreating of the gas oil feed at the VGO-HDS and the additional sulfur control provided at the FCCU can be expected to limit stack SOx emissions to less than the above listed 365 and 7 day limits and to less than 2,000 ppmv on a continuous basis.

SWAATS:

The SWAATS unit is limited to 30 ppmv SO_x @ 0% O_2 out the scrubber vent stack. This limit will be demonstrated by annual emissions testing. Based on the above listed emissions limit, emissions of SO_x (measured as $SO_{2)}$) are expected to be less than 2,000 ppmv on a continuous basis from the SWAATS unit.

Therefore, compliance with District Rule 4801 requirements is expected.

Rule 7012 Hexavalent Chromium - Cooling Towers

The proposed cooling towers are new and will not use hexavalent chromium; therefore, they are exempt from the requirements of this rule, except for the requirements set forth in 5.2.1, 6.1, and 7.1.

Section 5.2.1 requires that no hexavalent chromium compounds be added after 9/16/91 (intended to apply to cooling towers that previously used hexavalent chromium).

Section 6.1 requires that the owner/operator of a new cooling tower submit a compliance plan at least 90 days before it is operated containing business information, location of cooling tower, type and materials of construction, and a statement regarding the use or non use of hexavalent chromium. This information was included in the application submitted by Big West. Therefore, no additional information is required.

Section 7.1 requires the permittee pay permit filing fees associated with the cooling towers. Big West has paid the required filing fees.

Compliance is expected.

California Health & Safety Code 42301.6 (School Notice)

The District has verified that this site is not located within 1,000 feet of a school. Therefore, pursuant to California Health and Safety Code 42301.6, a school notice is not required.

California Environmental Quality Act (CEQA)

The District determined that the Kern County (County) is the public agency having principal responsibility for approving the project, therefore establishing the County as the Lead Agency (CEQA Guidelines §15051(b). The County has prepared a re-circulated Draft Environmental Impact Report (DEIR) for the project (SCH 2005121041) which demonstrates that the project would have a cumulatively significant and unavoidable impact on air Quality. The County accepted public comment on the proposed project and DEIR until August 11, 2008. Please direct all comments concerning the DEIR to Kern County Planning Department, 2700 M Street, Suite 100, Bakersfield, CA 93301-2323.

The District is a Responsible Agency for the project because of its discretionary approval power over the project via its Permits Rule (Rule 2010) and New Source Review Rule (Rule 2201), (CEQA Guidelines §15381). As a Responsible Agency the District complies with CEQA by considering the EIR prepared by the Lead Agency, and by reaching its own conclusion on whether and how to approve the project involved (CEQA Guidelines §15096). If the County approves the project and certifies the EIR, the District will complete its review of the project, and comply with CEQA Guidelines §15096 requirements.

Federal NSR Requirements for PM2.5 – 40 CFR Part 51 Appendix S

Federal NSR requirements for PM2.5 were recently codified in 40 CFR 51.165 Appendix S and became effective as of 7/15/08. These new requirements apply to new major sources and major modifications for PM2.5.

Big West's applications were deemed complete in 2006, i.e. prior to 7/15/08.

Rule 2201 - New and Modified Stationary Source Review section 2.0 states "... The requirements of this rule in effect on the date the application is determined to be complete by the Air Pollution Control Officer (APCO) shall apply to such applications.". In other words, this section clearly states that the version of Rule 2201 in effect when an application is deemed complete applies to such applications. Please note that this is a long standing provision in Rule 2201 and has been approved by EPA.

Notwithstanding the above, the preamble to the Appendix S regulation for PM2.5 (73 FR 28342) states ".. we do not believe it appropriate to allow grandfathering of pending permits pending permits being reviewed under the PM10 surrogate program in nonattainment areas ...". In other words, EPA believes that applications that are pending as of 7/15/08 should be subject to the Appendix S requirements for PM2.5. Please note that the above preamble citation does not state that it is mandatory for pending applications to be subject to Appendix S.

Furthermore, the text of the Appendix S does not address applications that are pending at the time the new requirements for PM2.5 were codified in Appendix S.

While Appendix S does not address the applicability of the requirements for PM2.5, Section I – Introduction provides some direction on how Appendix S requirements are to be implemented for pending applications.

Excerpt from Section I – Introduction:

> For each area designated as exceeding a NAAQS (nonattainment area) under 40 CFR part 81, subpart C, ... , this Interpretative Ruling will be superseded after June 30, 1979 (a) by preconstruction review provisions of the revised SIP, if the SIP meets the requirements of Part D, Title 1, of the Act; or (b) by a prohibition on construction under the applicable SIP and section 110(a)(2)(I) of the Act, if the SIP does not meet the requirements of Part D. The Ruling will remain in effect to the extent not superseded under the Act. <u>This prohibition on major new source construction does not apply to a source whose permit to construct was applied for during a period when the SIP was in compliance with Part D, or before the deadline for having a revised SIP in effect that satisfies Part D.</u>

The above section indicates that the non-attainment areas, e.g. the District, must either determine that new major sources and major modifications satisfy Federal NSR or prohibit the construction of new major sources or major modifications. It goes on to say the construction ban doesn't apply if the application for such sources was submitted when the non-attainment area's NSR rule was approved by EPA as part of the SIP.

It is reasonable to interpret this section such that applications pending on 7/15/08 are not subject to the Appendix S requirements for PM2.5.

Therefore, based on applicability of Rule 2201 amendments to new applications, the preamble to Appendix S, and Appendix S as codified in 40 CFR part 51, it is not required that the District apply Appendix S requirements to pending applications.

Because these applications were deemed complete prior to 7/15/08, they are not subject to Appendix S requirements for PM2.5.

IX. Recommendation

Compliance with all applicable rules and regulations is expected. Upon completion the public noticing period and the California Environmental Quality Act (CEQA) review of the Environmental Impact report and approval by Kern County as the lead agency, issue Authority to Construct S-33-407-0, '408-0, '409-0, '410-0, '411-0, '413-0, '415-0 and '416-0 subject to the permit conditions on the attached draft Authorities to Construct (***Appendix I***).

X. Billing Information

Annual Permit Fees			
Permit Number	Fee Schedule	Fee Description	Annual Fee
S-33-407-0	3020-02-H	641,000 kBtu/hr	$882.00
S-33-408-0	3020-02-H	82,000 kBtu/hr	$882.00
S-33-409-0	3020-01-E	< 400 electric hp	$352.00
S-33-410-0	3020-02-H	89,000 kBtu/hr	$882.00
S-33-411-0	3020-02-H	215,000 kBtu/hr	$882.00
S-33-413-0	3020-02-H	27,000,000 kBtu/hr	$882.00
S-33-415-0	3020-01-G	< 400 electric hp	$352.00
S-33-416-0	3020-01-G	< 400 electric hp	$352.00

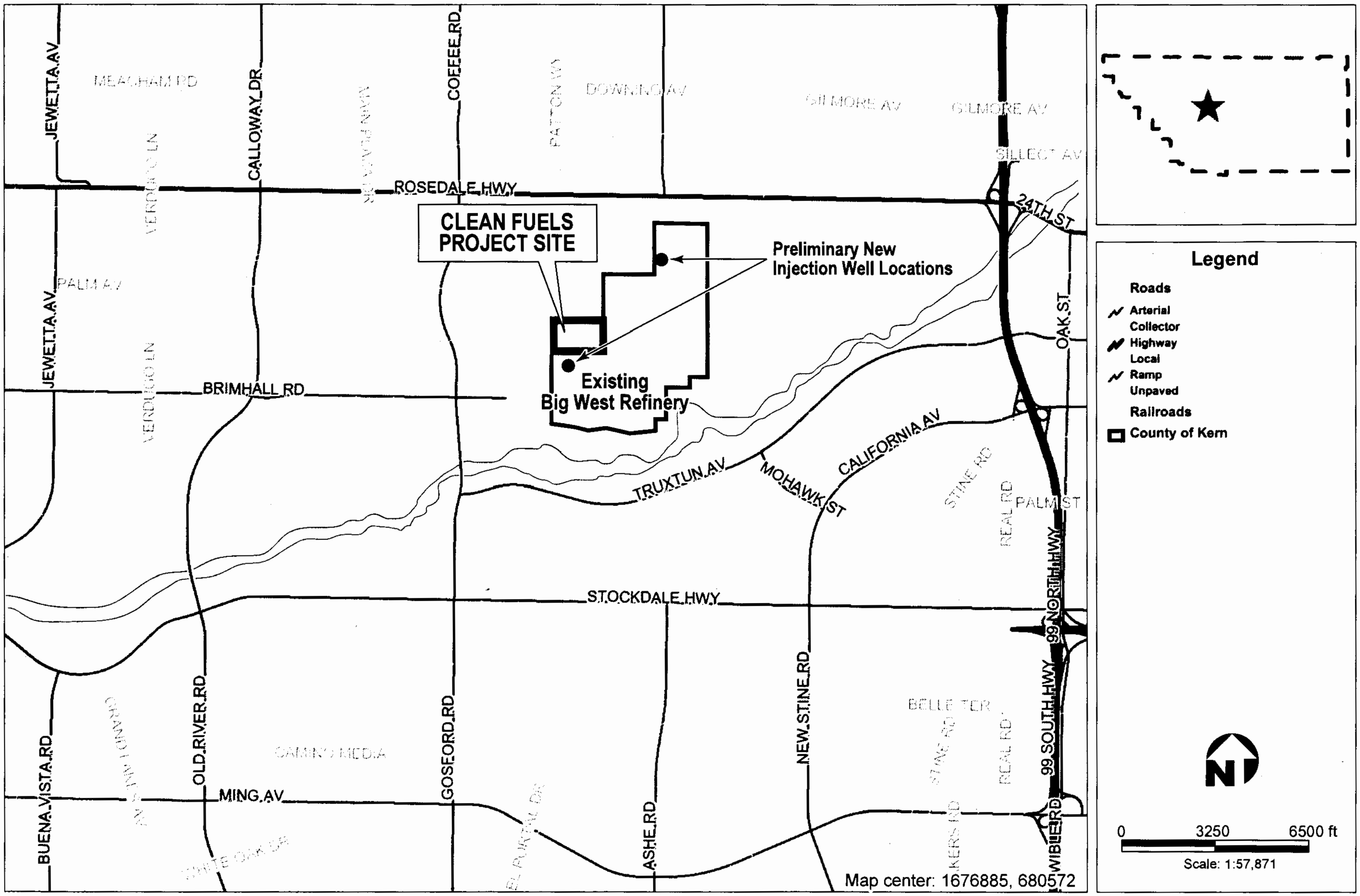
Appendixes

A: Project Location Drawings
B: Process Flow Diagrams
C: Emission Summary
  Fugitive Emissions, Each Unit and Summary Page
  Non-Fugitive Emissions, Each Unit
  Daily and Annual Emissions Summary
  Quarterly Net Emissions Change (QNEC)
D: Applicable District BACT Guidelines
E: Top Down BACT Analyses
F: Interpollutant Offset Analysis
G. Risk Management Review
H: Compliance Certification Form
I: Draft Authority to Construct

Appendix A

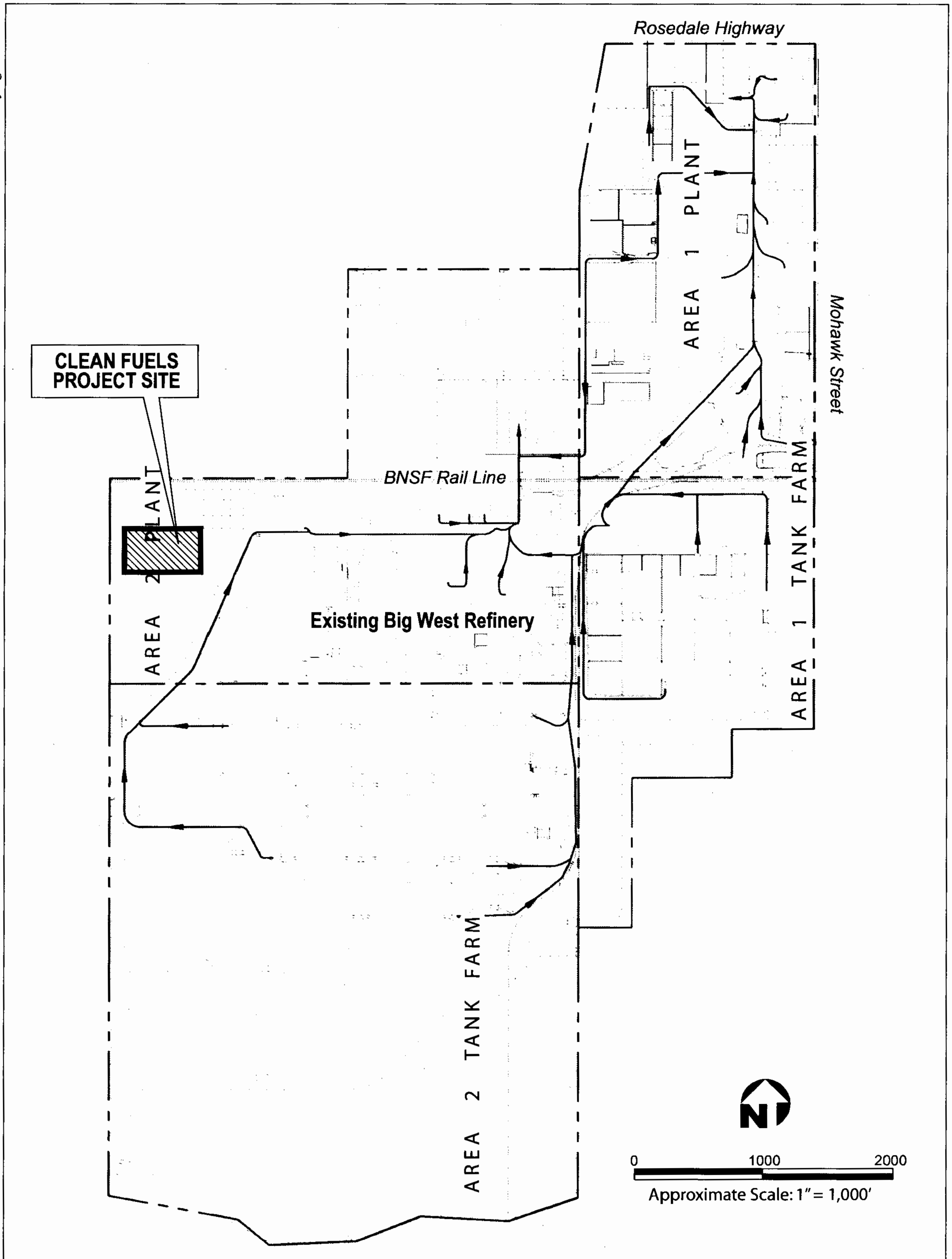
Project Location Drawings

T:\Ladd\Flying J\1105-291



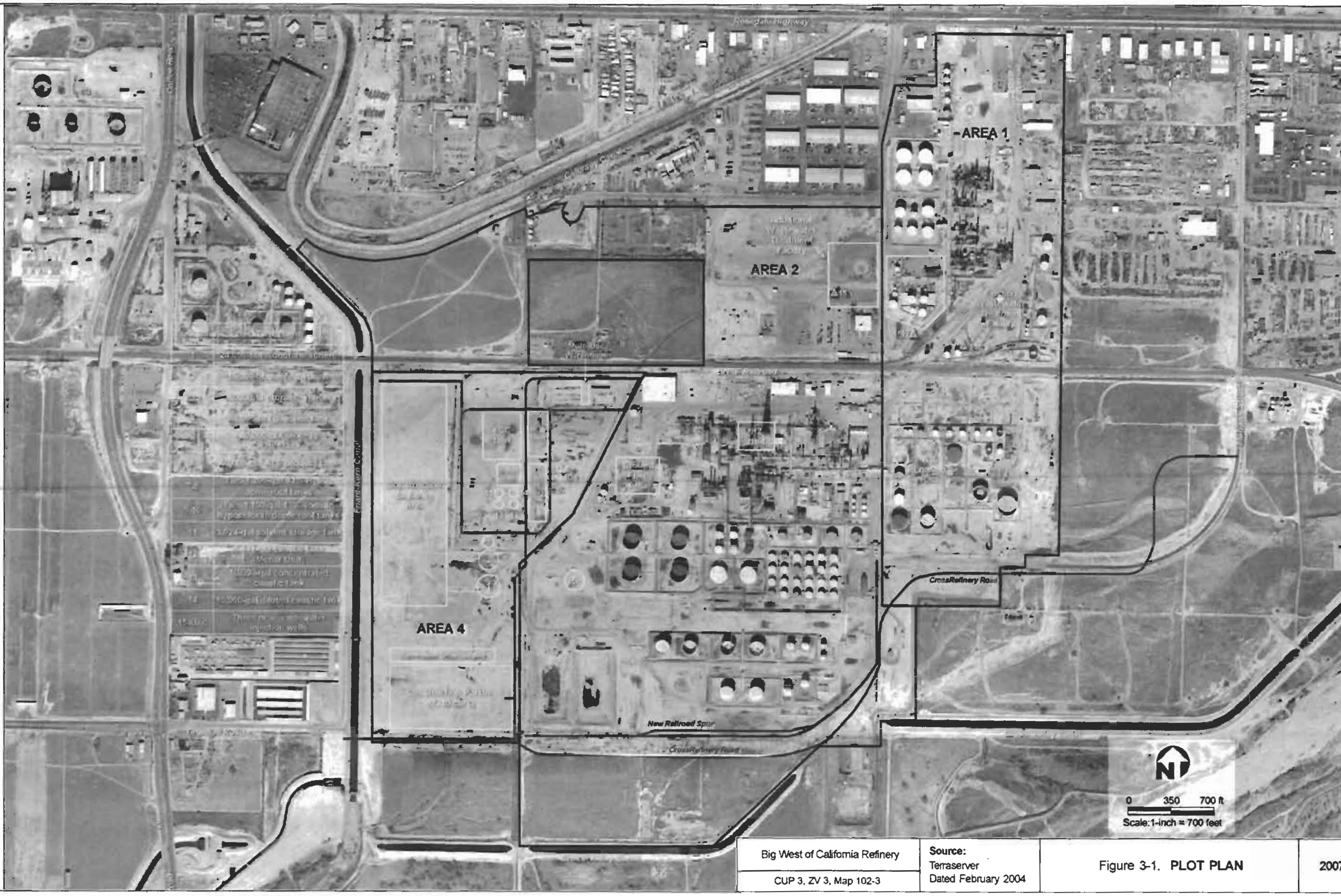
Big West of California Refinery	Figure 1-2. **SITE LOCATION MAP** **County of Kern**	2007
CUP 3, ZV 3, Map 102-3		

T\Ladd\Flying J\1105-290



Big West of California Refinery 6451 Rosedale Highway	Figure 3. **PROJECT SITE**	December 2005
CUP 3, ZV 3, Map 102-33		

T:\Ladd\Flying J-Big West\1006-161(rev1-23-07)



Big West of California Refinery	Source: Terraserver Dated February 2004	Figure 3-1. **PLOT PLAN**	2007
CUP 3, ZV 3, Map 102-3			

Appendix B

Process Flow Diagrams

The Process Flow Diagrams Have Been Classified as Confidential Material and Have Been Removed From The Public Record

Appendix C

Emissions Summary

Fugitive Emissions

Fugitive Emissions Summary

Permit Unit	Emission Unit	Fugitive VOC (lb/day)	Fugitive VOC (lb/yr)
S-33-407	HGU2	15.3	5585
S-33-408	VGO-HDS	46.3	16900
	3 phase sep	0.6	219
	sour water stripper	7.1	2592
	amnine	4.6	1679
	amine absorber	3.7	1351
	coker fuel gas treater	2.6	948
	pipeline	0.7	255
S-33-410	FCCU reactor	4.9	1789
	FCCU -main col	17.3	6315
	FCCU- gas conc	17.2	6278
S-33-411	LPG Merox	10.3	3760
	LPG alky	39.8	14527
S-33-413	Ground Flare	3.00	1095
	Flare Gas Recovery	3.90	1423
Total		177.3	64716

Fugitive Emissions - HGU2, Permit Unit S-33-407

	C1	C2	C3	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15
R1		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)
R2																
R3		47.25	0	793.8	0	0	0	141.75	0	2380.05	0	0	32.4	0	12.15	0
R4																
R5	<100	0.9864	0.9992	0.9901	0.5561	0.5561	0.7188	0.9946	0.9946	0.9946	0.7063	0.8756	0.8756	0.9901	0.9867	0.9867
R6	<500	0.0046	0.0004	0.0030	0.4089	0.4089	0.2760	0.0045	0.0045	0.0045	0.2727	0.1096	0.1096	0.0030	0.0111	0.0111
R7	<1,000	0.0021	0.0004	0.0017	0.0142	0.0142	0.0052	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0017	0.0002	0.0002
R8	<2,000	0.0033	0.0000	0.0020	0.0099	0.0099	0.0000	0.0004	0.0004	0.0004	0.0000	0.0040	0.0040	0.0020	0.0008	0.0008
R9	<5,000	0.0024	0.0000	0.0018	0.0056	0.0056	0.0000	0.0001	0.0001	0.0001	0.0000	0.0040	0.0040	0.0018	0.0006	0.0006
R10	<10,000	0.0011	0.0000	0.0011	0.0039	0.0039	0.0000	0.0001	0.0001	0.0001	0.0070	0.0045	0.0045	0.0011	0.0005	0.0005
R11	Pegged	0.0002	0.0000	0.0001	0.0013	0.0013	0.0000	0.0002	0.0002	0.0002	0.0140	0.0023	0.0023	0.0001	0.0001	0.0001
R12																
R13		46.61	0.00	785.94	0.00	0.00	0.00	140.98	0.00	2367.20	0.00	0.00	28.37	0.00	11.99	0.00
R14		0.22	0.00	2.38	0.00	0.00	0.00	0.64	0.00	10.71	0.00	0.00	3.55	0.00	0.13	0.00
R15		0.10	0.00	1.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
R16		0.16	0.00	1.59	0.00	0.00	0.00	0.06	0.00	0.95	0.00	0.00	0.13	0.00	0.01	0.00
R17		0.11	0.00	1.43	0.00	0.00	0.00	0.01	0.00	0.24	0.00	0.00	0.13	0.00	0.01	0.00
R18		0.05	0.00	0.87	0.00	0.00	0.00	0.01	0.00	0.24	0.00	0.00	0.15	0.00	0.01	0.00
R19		0.01	0.00	0.08	0.00	0.00	0.00	0.03	0.00	0.48	0.00	0.00	0.07	0.00	0.00	0.00
R20																
R21		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)
R22	50	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	1.58E-04	1.58E-04	1.58E-04	2.36E-04	2.36E-04	2.36E-04	9.30E-05	6.00E-05	6.00E-05
R23	300	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	5.60E-04	5.60E-04	5.60E-04	7.46E-04	7.46E-04	7.46E-04	3.55E-04	2.24E-04	2.24E-04
R24	750	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	1.07E-03	1.07E-03	1.07E-03	1.34E-03	1.34E-03	1.34E-03	7.03E-04	4.41E-04	4.41E-04
R25	1500	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.74E-03	1.74E-03	1.74E-03	2.10E-03	2.10E-03	2.10E-03	1.18E-03	7.34E-04	7.34E-04
R26	3500	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	3.17E-03	3.17E-03	3.17E-03	3.61E-03	3.61E-03	3.61E-03	2.22E-03	1.37E-03	1.37E-03
R27	7500	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	5.44E-03	5.44E-03	5.44E-03	5.89E-03	5.89E-03	5.89E-03	3.93E-03	2.40E-03	2.40E-03
R28	Pegged	0.141	0.141	0.141	0.196	0.196	0.196	0.209	0.209	0.209	0.181	0.181	0.181	0.141	0.066	0.066
R29																
R30		4.33E-03	0.00E+00	7.31E-02	0.00E+00	0.00E+00	0.00E+00	2.23E-02	0.00E+00	3.74E-01	0.00E+00	0.00E+00	6.70E-03	0.00E+00	7.20E-04	0.00E+00
R31		7.80E-05	0.00E+00	8.44E-04	0.00E+00	0.00E+00	0.00E+00	3.58E-04	0.00E+00	6.00E-03	0.00E+00	0.00E+00	2.65E-03	0.00E+00	2.92E-05	0.00E+00
R32		7.03E-05	0.00E+00	9.49E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
R33		1.89E-04	0.00E+00	1.88E-03	0.00E+00	0.00E+00	0.00E+00	1.05E-04	0.00E+00	1.66E-03	0.00E+00	0.00E+00	2.72E-04	0.00E+00	7.34E-06	0.00E+00
R34		2.44E-04	0.00E+00	3.18E-03	0.00E+00	0.00E+00	0.00E+00	3.17E-05	0.00E+00	7.62E-04	0.00E+00	0.00E+00	4.69E-04	0.00E+00	1.37E-05	0.00E+00
R35		1.96E-04	0.00E+00	3.42E-03	0.00E+00	0.00E+00	0.00E+00	5.44E-05	0.00E+00	1.30E-03	0.00E+00	0.00E+00	8.84E-04	0.00E+00	2.40E-05	0.00E+00
R36		1.41E-03	0.00E+00	1.13E-02	0.00E+00	0.00E+00	0.00E+00	6.28E-03	0.00E+00	1.01E-01	0.00E+00	0.00E+00	1.27E-02	0.00E+00	0.00E+00	0.00E+00
R37																
R38		6.52E-03	0.00E+00	9.46E-02	0.00E+00	0.00E+00	0.00E+00	2.91E-02	0.00E+00	4.84E-01	0.00E+00	0.00E+00	2.36E-02	0.00E+00	7.94E-04	0.00E+00
R39		1.57E-01	0.00E+00	2.27E+00	0.00E+00	0.00E+00	0.00E+00	6.99E-01	0.00E+00	1.16E+01	0.00E+00	0.00E+00	5.67E-01	0.00E+00	1.91E-02	0.00E+00
R40																
R41																1.53E+01
R42																5585

Row 1 (R1) shows the specific componet types.
Row 3 (R3) shows the number of proposed components for the emissions unit per component type. Number includes a 20% contingency.
Rows R5 through R11 shows the historical percentages of leaking components for the listed screening level ranges shown in column 1 (C1).
Rows R13 through R19 shows the number of components for each screening level range based on the historical percentages of leaking components.
Rows R22 through 28 show the CAPCOA correlaiton equation derived emissions factors (lb/hr/component). The screening values used in the equation are shown in C1.
Rows R30 through R36 show the emissions (lb/hr) per component type per screening level range.
Row R38 shows the total lb/hr emisions per component type for all screening value ranges.
Row R39 shows the total lb/day emisions per component type for all screening value ranges.
Row 41 shows the total lb/day emissions for the emissions unit.
Row 42 shows the total lb/yr emissions for the emissions unit.

Fugitive Emissions - VGO-HDS, Permit Unit S-33-408

	C1	C2	C3	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17
R1		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)		
R2																		
R3		746.55	579.15	1181.25	17.55	0	10.8	2280.15	1763.1	3323.7	35.1	0	31.05	0	10.8	8.1		
R4																		
R5	<100	0.9864	0.9992	0.9901	0.5561	0.5561	0.7188	0.9946	0.9946	0.9946	0.7063	0.8756	0.8756	0.9901	0.9867	0.9867		
R6	<500	0.0046	0.0004	0.0030	0.4089	0.4089	0.2760	0.0045	0.0045	0.0045	0.2727	0.1096	0.1096	0.0030	0.0111	0.0111		
R7	<1,000	0.0021	0.0004	0.0017	0.0142	0.0142	0.0052	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0017	0.0002	0.0002		
R8	<2,000	0.0033	0.0000	0.0020	0.0099	0.0099	0.0000	0.0004	0.0004	0.0004	0.0000	0.0040	0.0040	0.0020	0.0008	0.0008		
R9	<5,000	0.0024	0.0000	0.0018	0.0056	0.0056	0.0000	0.0001	0.0001	0.0001	0.0000	0.0040	0.0040	0.0018	0.0006	0.0006		
R10	<10,000	0.0011	0.0000	0.0011	0.0039	0.0039	0.0000	0.0001	0.0001	0.0001	0.0070	0.0045	0.0045	0.0011	0.0005	0.0005		
R11	Pegged	0.0002	0.0000	0.0001	0.0013	0.0013	0.0000	0.0002	0.0002	0.0002	0.0140	0.0023	0.0023	0.0001	0.0001	0.0001		
R12																		
R13		736.40	578.69	1169.56	9.76	0.00	7.76	2267.84	1753.58	3305.75	24.79	0.00	27.19	0.00	10.66	7.99		
R14		3.43	0.23	3.54	7.18	0.00	2.98	10.26	7.93	14.96	9.57	0.00	3.40	0.00	0.12	0.09		
R15		1.57	0.23	2.01	0.25	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
R16		2.46	0.00	2.36	0.17	0.00	0.00	0.91	0.71	1.33	0.00	0.00	0.12	0.00	0.01	0.01		
R17		1.79	0.00	2.13	0.10	0.00	0.00	0.23	0.18	0.33	0.00	0.00	0.12	0.00	0.01	0.00		
R18		0.82	0.00	1.30	0.07	0.00	0.00	0.23	0.18	0.33	0.25	0.00	0.14	0.00	0.01	0.00		
R19		0.15	0.00	0.12	0.02	0.00	0.00	0.46	0.35	0.66	0.49	0.00	0.07	0.00	0.00	0.00		
R20																		
R21		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)		
R22	50	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	1.58E-04	1.58E-04	1.58E-04	2.36E-04	2.36E-04	2.36E-04	9.30E-05	6.00E-05	6.00E-05		
R23	300	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	5.60E-04	5.60E-04	5.60E-04	7.46E-04	7.46E-04	7.46E-04	3.55E-04	2.24E-04	2.24E-04		
R24	750	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	1.07E-03	1.07E-03	1.07E-03	1.34E-03	1.34E-03	1.34E-03	7.03E-04	4.41E-04	4.41E-04		
R25	1500	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.74E-03	1.74E-03	1.74E-03	2.10E-03	2.10E-03	2.10E-03	1.18E-03	7.34E-04	7.34E-04		
R26	3500	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	3.17E-03	3.17E-03	3.17E-03	3.61E-03	3.61E-03	3.61E-03	2.22E-03	1.37E-03	1.37E-03		
R27	7500	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	5.44E-03	5.44E-03	5.44E-03	5.89E-03	5.89E-03	5.89E-03	3.93E-03	2.40E-03	2.40E-03		
R28	Pegged	0.141	0.141	0.141	0.196	0.196	0.196	0.209	0.209	0.209	0.181	0.181	0.181	0.141	0.066	0.066		
R29																		
R30		6.85E-02	5.38E-02	1.09E-01	9.08E-04	0.00E+00	7.22E-04	3.59E-01	2.77E-01	5.23E-01	5.85E-03	0.00E+00	6.42E-03	0.00E+00	6.40E-04	4.80E-04		
R31		1.22E-03	8.16E-05	1.26E-03	2.55E-03	0.00E+00	1.06E-03	5.75E-03	4.44E-03	8.38E-03	7.14E-03	0.00E+00	2.54E-03	0.00E+00	2.69E-05	2.02E-05		
R32		1.10E-03	1.62E-04	1.41E-03	1.76E-04	0.00E+00	4.22E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
R33		2.90E-03	0.00E+00	2.78E-03	2.01E-04	0.00E+00	0.00E+00	1.59E-03	1.24E-03	2.32E-03	0.00E+00	0.00E+00	2.52E-04	0.00E+00	7.34E-06	7.34E-06		
R34		3.98E-03	0.00E+00	4.73E-03	2.22E-04	0.00E+00	0.00E+00	7.30E-04	5.71E-04	1.05E-03	0.00E+00	0.00E+00	4.33E-04	0.00E+00	1.37E-05	0.00E+00		
R35		3.22E-03	0.00E+00	5.10E-03	2.75E-04	0.00E+00	0.00E+00	1.25E-03	9.78E-04	1.79E-03	1.47E-03	0.00E+00	8.25E-04	0.00E+00	2.40E-05	0.00E+00		
R36		2.12E-02	0.00E+00	1.69E-02	3.92E-03	0.00E+00	0.00E+00	9.63E-02	7.33E-02	1.38E-01	8.86E-02	0.00E+00	1.27E-02	0.00E+00	0.00E+00	0.00E+00		
R37																		
R38		1.02E-01	5.41E-02	1.41E-01	8.25E-03	0.00E+00	1.82E-03	4.64E-01	3.58E-01	6.74E-01	1.03E-01	0.00E+00	2.31E-02	0.00E+00	7.12E-04	5.07E-04		
R39		2.45E+00	1.30E+00	3.38E+00	1.98E-01	0.00E+00	4.37E-02	1.11E+01	8.59E+00	1.62E+01	2.47E+00	0.00E+00	5.55E-01	0.00E+00	1.71E-02	1.22E-02		
R40																		
R41																4.63E+01		
R42																16900		

Row 1 (R1) shows the specific componet types.
Row 3 (R3) shows the number of proposed components for the emissions unit per component type. Number includes a 20% contingency.
Rows R5 through R11 shows the historical percentages of leaking components for the listed screening level ranges shown in column 1 (C1).
Rows R13 through R19 shows the number of components for each screening level range based on the historical percentages of leaking components.
Rows R22 through 28 show the CAPCOA correlaiton equation derived emissions factors (lb/hr/component). The screening values used in the equation are shown in C1.
Rows R30 through R36 show the emissions (lb/hr) per component type per screening level range.
Row R38 shows the total lb/hr emisions per component type for all screening value ranges.
Row R39 shows the total lb/day emisions per component type for all screening value ranges.
Row R41 shows the total lb/day emissions for the emissions unit.
Row R42 shows the total lb/yr emissions for the emissions unit.

Fugitive Emissions - VGO HDS - Three Phase Sep (2), Permit Unit S-33-408

	C1	C2	C3	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17
R1		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)		
R2																		
R3		43.2	0	21.6	2.7	0	0	64.8	0	16.2	0	0	0	0	0	0		
R4																		
R5	<100	0.9864	0.9992	0.9901	0.5561	0.5561	0.7188	0.9946	0.9946	0.9946	0.7063	0.8756	0.8756	0.9901	0.9867	0.9867		
R6	<500	0.0046	0.0004	0.0030	0.4089	0.4089	0.2760	0.0045	0.0045	0.0045	0.2727	0.1096	0.1096	0.0030	0.0111	0.0111		
R7	<1,000	0.0021	0.0004	0.0017	0.0142	0.0142	0.0052	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0017	0.0002	0.0002		
R8	<2,000	0.0033	0.0000	0.0020	0.0099	0.0099	0.0000	0.0004	0.0004	0.0004	0.0000	0.0040	0.0040	0.0020	0.0008	0.0008		
R9	<5,000	0.0024	0.0000	0.0018	0.0056	0.0056	0.0000	0.0001	0.0001	0.0001	0.0000	0.0040	0.0040	0.0018	0.0006	0.0006		
R10	<10,000	0.0011	0.0000	0.0011	0.0039	0.0039	0.0000	0.0001	0.0001	0.0001	0.0070	0.0045	0.0045	0.0011	0.0005	0.0005		
R11	Pegged	0.0002	0.0000	0.0001	0.0013	0.0013	0.0000	0.0002	0.0002	0.0002	0.0140	0.0023	0.0023	0.0001	0.0001	0.0001		
R12																		
R13		42.61	0.00	21.39	1.50	0.00	0.00	64.45	0.00	16.11	0.00	0.00	0.00	0.00	0.00	0.00		
R14		0.20	0.00	0.06	1.10	0.00	0.00	0.29	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00		
R15		0.09	0.00	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
R16		0.14	0.00	0.04	0.03	0.00	0.00	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00		
R17		0.10	0.00	0.04	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
R18		0.05	0.00	0.02	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
R19		0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
R20																		
R21		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)		
R22	50	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	1.58E-04	1.58E-04	1.58E-04	2.36E-04	2.36E-04	2.36E-04	9.30E-05	6.00E-05	6.00E-05		
R23	300	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	5.60E-04	5.60E-04	5.60E-04	7.46E-04	7.46E-04	7.46E-04	3.55E-04	2.24E-04	2.24E-04		
R24	750	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	1.07E-03	1.07E-03	1.07E-03	1.34E-03	1.34E-03	1.34E-03	7.03E-04	4.41E-04	4.41E-04		
R25	1500	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.74E-03	1.74E-03	1.74E-03	2.10E-03	2.10E-03	2.10E-03	1.18E-03	7.34E-04	7.34E-04		
R26	3500	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	3.17E-03	3.17E-03	3.17E-03	3.61E-03	3.61E-03	3.61E-03	2.22E-03	1.37E-03	1.37E-03		
R27	7500	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	5.44E-03	5.44E-03	5.44E-03	5.89E-03	5.89E-03	5.89E-03	3.93E-03	2.40E-03	2.40E-03		
R28	Pegged	0.141	0.141	0.141	0.196	0.196	0.196	0.209	0.209	0.209	0.181	0.181	0.181	0.141	0.066	0.066		
R29																		
R30		3.96E-03	0.00E+00	1.99E-03	1.40E-04	0.00E+00	0.00E+00	1.02E-02	0.00E+00	2.55E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
R31		7.09E-05	0.00E+00	2.13E-05	3.90E-04	0.00E+00	0.00E+00	1.62E-04	0.00E+00	3.92E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
R32		6.33E-05	0.00E+00	2.81E-05	2.81E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
R33		1.65E-04	0.00E+00	4.72E-05	3.54E-05	0.00E+00	0.00E+00	5.23E-05	0.00E+00	1.74E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
R34		2.22E-04	0.00E+00	8.89E-05	4.44E-05	0.00E+00	0.00E+00	3.17E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
R35		1.96E-04	0.00E+00	7.85E-05	3.93E-05	0.00E+00	0.00E+00	5.44E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
R36		1.41E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.09E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
R37																		
R38		6.09E-03	0.00E+00	2.25E-03	6.77E-04	0.00E+00	0.00E+00	1.26E-02	0.00E+00	2.60E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
R39		1.46E-01	0.00E+00	5.41E-02	1.62E-02	0.00E+00	0.00E+00	3.02E-01	0.00E+00	6.25E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
R40																		
R41																6.00E-01		
R42																219		

Row 1 (R1) shows the specific componet types.
Row 3 (R3) shows the number of proposed components for the emissions unit per component type. Number includes a 20% contingency.
Rows R5 through R11 shows the historical percentages of leaking components for the listed screening level ranges shown in column 1 (C1).
Rows R13 through R19 shows the number of components for each screening level range based on the historical percentages of leaking components.
Rows R22 through 28 show the CAPCOA correlaiton equation derived emissions factors (lb/hr/component). The screening values used in the equation are shown in C1.
Rows R30 through R36 show the emissions (lb/hr) per component type per screening level range.
Row R38 shows the total lb/hr emisions per component type for all screening value ranges.
Row R39 shows the total lb/day emisions per component type for all screening value ranges.
Row 41 shows the total lb/day emissions for the emissions unit.
Row 42 shows the total lb/yr emissions for the emissions unit.

Fugitive Emissions - VGO HDS, Sour Water Stripper Permit Unit S-33-408

	C1	C2	C3	C3	C4	C5	C6	C7
R1		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)
R2								
R3		0	480.6	110.7	0	0	9.45	0
R4								
R5	<100	0.9864	0.9992	0.9901	0.5561	0.5561	0.7188	0.9946
R6	<500	0.0046	0.0004	0.0030	0.4089	0.4089	0.2760	0.0045
R7	<1,000	0.0021	0.0004	0.0017	0.0142	0.0142	0.0052	0.0000
R8	<2,000	0.0033	0.0000	0.0020	0.0099	0.0099	0.0000	0.0004
R9	<5,000	0.0024	0.0000	0.0018	0.0056	0.0056	0.0000	0.0001
R10	<10,000	0.0011	0.0000	0.0011	0.0039	0.0039	0.0000	0.0001
R11	Pegged	0.0002	0.0000	0.0001	0.0013	0.0013	0.0000	0.0002
R12								
R13		0.00	480.22	109.60	0.00	0.00	6.79	0.00
R14		0.00	0.19	0.33	0.00	0.00	2.61	0.00
R15		0.00	0.19	0.19	0.00	0.00	0.05	0.00
R16		0.00	0.00	0.22	0.00	0.00	0.00	0.00
R17		0.00	0.00	0.20	0.00	0.00	0.00	0.00
R18		0.00	0.00	0.12	0.00	0.00	0.00	0.00
R19		0.00	0.00	0.01	0.00	0.00	0.00	0.00
R20								
R21		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)
R22	50	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	1.58E-04
R23	300	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	5.60E-04
R24	750	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	1.07E-03
R25	1500	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.74E-03
R26	3500	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	3.17E-03
R27	7500	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	5.44E-03
R28	Pegged	0.141	0.141	0.141	0.196	0.196	0.196	0.209
R29								
R30		0.00E+00	4.47E-02	1.02E-02	0.00E+00	0.00E+00	6.31E-04	0.00E+00
R31		0.00E+00	6.74E-05	1.17E-04	0.00E+00	0.00E+00	9.26E-04	0.00E+00
R32		0.00E+00	1.34E-04	1.34E-04	0.00E+00	0.00E+00	3.52E-05	0.00E+00
R33		0.00E+00	0.00E+00	2.60E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
R34		0.00E+00	0.00E+00	4.44E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
R35		0.00E+00	0.00E+00	4.71E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
R36		0.00E+00	0.00E+00	1.41E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
R37								
R38		0.00E+00	4.49E-02	1.30E-02	0.00E+00	0.00E+00	1.59E-03	0.00E+00
R39		0.00E+00	1.08E+00	3.13E-01	0.00E+00	0.00E+00	3.82E-02	0.00E+00
R40								
R41								
R42								

	C8	C9	C10	C11	C12	C13	C14	C15
R1	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)
R2								
R3	893.7	148.5	5.4	5.4	5.4	8.1	0	1.35
R4								
R5	0.9946	0.9946	0.7063	0.8756	0.8756	0.9901	0.9867	0.9867
R6	0.0045	0.0045	0.2727	0.1096	0.1096	0.0030	0.0111	0.0111
R7	0.0000	0.0000	0.0000	0.0000	0.0000	0.0017	0.0002	0.0002
R8	0.0004	0.0004	0.0000	0.0040	0.0040	0.0020	0.0008	0.0008
R9	0.0001	0.0001	0.0000	0.0040	0.0040	0.0018	0.0006	0.0006
R10	0.0001	0.0001	0.0070	0.0045	0.0045	0.0011	0.0005	0.0005
R11	0.0002	0.0002	0.0140	0.0023	0.0023	0.0001	0.0001	0.0001
R12								
R13	888.87	147.70	3.81	4.73	4.73	8.02	0.00	1.33
R14	4.02	0.67	1.47	0.59	0.59	0.02	0.00	0.01
R15	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
R16	0.36	0.06	0.00	0.02	0.02	0.02	0.00	0.00
R17	0.09	0.01	0.00	0.02	0.02	0.01	0.00	0.00
R18	0.09	0.01	0.04	0.02	0.02	0.01	0.00	0.00
R19	0.18	0.03	0.08	0.01	0.01	0.00	0.00	0.00
R20								
R21	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)
R22	1.58E-04	1.58E-04	2.36E-04	2.36E-04	2.36E-04	9.30E-05	6.00E-05	6.00E-05
R23	5.60E-04	5.60E-04	7.46E-04	7.46E-04	7.46E-04	3.55E-04	2.24E-04	2.24E-04
R24	1.07E-03	1.07E-03	1.34E-03	1.34E-03	1.34E-03	7.03E-04	4.41E-04	4.41E-04
R25	1.74E-03	1.74E-03	2.10E-03	2.10E-03	2.10E-03	1.18E-03	7.34E-04	7.34E-04
R26	3.17E-03	3.17E-03	3.61E-03	3.61E-03	3.61E-03	2.22E-03	1.37E-03	1.37E-03
R27	5.44E-03	5.44E-03	5.89E-03	5.89E-03	5.89E-03	3.93E-03	2.40E-03	2.40E-03
R28	0.209	0.209	0.181	0.181	0.181	0.141	0.066	0.066
R29								
R30	1.41E-01	2.33E-02	9.00E-04	1.12E-03	1.12E-03	7.46E-04	0.00E+00	7.99E-05
R31	2.25E-03	3.75E-04	1.10E-03	4.40E-04	4.40E-04	7.09E-06	0.00E+00	2.24E-06
R32	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.03E-06	0.00E+00	0.00E+00
R33	6.28E-04	1.05E-04	0.00E+00	4.19E-05	4.19E-05	2.36E-05	0.00E+00	0.00E+00
R34	2.86E-04	3.17E-05	0.00E+00	7.22E-05	7.22E-05	2.22E-05	0.00E+00	0.00E+00
R35	4.89E-04	5.44E-05	2.36E-04	1.18E-04	1.18E-04	3.93E-05	0.00E+00	0.00E+00
R36	3.77E-02	6.28E-03	1.45E-02	1.81E-03	1.81E-03	0.00E+00	0.00E+00	0.00E+00
R37								
R38	1.82E-01	3.02E-02	1.67E-02	3.60E-03	3.60E-03	8.45E-04	0.00E+00	8.21E-05
R39	4.37E+00	7.25E-01	4.01E-01	8.63E-02	8.63E-02	2.03E-02	0.00E+00	1.97E-03
R40								
R41								7.10E+00
R42								2592

Row 1 (R1) shows the specific componet types.
Row 3 (R3) shows the number of proposed components for the emissions unit per component type. Number includes a 20% contingency.
Rows R5 through R11 shows the historical percentages of leaking components for the listed screening level ranges shown in column 1 (C1).
Rows R13 through R19 shows the number of components for each screening level range based on the historical percentages of leaking components.
Rows R22 through 28 show the CAPCOA correlaiton equation derived emissions factors (lb/hr/component). The screening values used in the equation are shown in C1.
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Row R38 shows the total lb/hr emisions per component type for all screening value ranges.
Row R39 shows the total lb/day emisions per component type for all screening value ranges.
Row 41 shows the total lb/day emissions for the emissions unit.
Row 42 shows the total lb/yr emissions for the emissions unit.

Fugitive Emissions - VGO HDS, Amine Unit Permit Unit S-33-408

	C1	C2	C3	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15
R1		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)
R2																
R3		0	410.07	39.15	0	0	8.1	0	676.35	20.25	0	4.05	2.7	2.7	0	0
R4																
R5	<100	0.9864	0.9992	0.9901	0.5561	0.5561	0.7188	0.9946	0.9946	0.9946	0.7063	0.8756	0.8756	0.9901	0.9867	0.9867
R6	<500	0.0046	0.0004	0.0030	0.4089	0.4089	0.2760	0.0045	0.0045	0.0045	0.2727	0.1096	0.1096	0.0030	0.0111	0.0111
R7	<1,000	0.0021	0.0004	0.0017	0.0142	0.0142	0.0052	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0017	0.0002	0.0002
R8	<2,000	0.0033	0.0000	0.0020	0.0099	0.0099	0.0000	0.0004	0.0004	0.0004	0.0000	0.0040	0.0040	0.0020	0.0008	0.0008
R9	<5,000	0.0024	0.0000	0.0018	0.0056	0.0056	0.0000	0.0001	0.0001	0.0001	0.0000	0.0040	0.0040	0.0018	0.0006	0.0006
R10	<10,000	0.0011	0.0000	0.0011	0.0039	0.0039	0.0000	0.0001	0.0001	0.0001	0.0070	0.0045	0.0045	0.0011	0.0005	0.0005
R11	Pegged	0.0002	0.0000	0.0001	0.0013	0.0013	0.0000	0.0002	0.0002	0.0002	0.0140	0.0023	0.0023	0.0001	0.0001	0.0001
R12																
R13		0.00	409.74	38.76	0.00	0.00	5.82	0.00	672.70	20.14	0.00	3.55	2.36	2.67	0.00	0.00
R14		0.00	0.16	0.12	0.00	0.00	2.24	0.00	3.04	0.09	0.00	0.44	0.30	0.01	0.00	0.00
R15		0.00	0.16	0.07	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
R16		0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.27	0.01	0.00	0.02	0.01	0.01	0.00	0.00
R17		0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.02	0.01	0.00	0.00	0.00
R18		0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.02	0.01	0.00	0.00	0.00
R19		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.01	0.01	0.00	0.00	0.00
R20																
R21		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)
R22	50	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	1.58E-04	1.58E-04	1.58E-04	2.36E-04	2.36E-04	2.36E-04	9.30E-05	6.00E-05	6.00E-05
R23	300	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	5.60E-04	5.60E-04	5.60E-04	7.46E-04	7.46E-04	7.46E-04	3.55E-04	2.24E-04	2.24E-04
R24	750	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	1.07E-03	1.07E-03	1.07E-03	1.34E-03	1.34E-03	1.34E-03	7.03E-04	4.41E-04	4.41E-04
R25	1500	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.74E-03	1.74E-03	1.74E-03	2.10E-03	2.10E-03	2.10E-03	1.18E-03	7.34E-04	7.34E-04
R26	3500	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	3.17E-03	3.17E-03	3.17E-03	3.61E-03	3.61E-03	3.61E-03	2.22E-03	1.37E-03	1.37E-03
R27	7500	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	5.44E-03	5.44E-03	5.44E-03	5.89E-03	5.89E-03	5.89E-03	3.93E-03	2.40E-03	2.40E-03
R28	Pegged	0.141	0.141	0.141	0.196	0.196	0.196	0.209	0.209	0.209	0.181	0.181	0.181	0.141	0.066	0.066
R29																
R30		0.00E+00	3.81E-02	3.60E-03	0.00E+00	0.00E+00	5.41E-04	0.00E+00	1.06E-01	3.18E-03	0.00E+00	8.38E-04	5.57E-04	2.48E-04	0.00E+00	0.00E+00
R31		0.00E+00	5.67E-05	4.26E-05	0.00E+00	0.00E+00	7.94E-04	0.00E+00	1.70E-03	5.04E-05	0.00E+00	3.28E-04	2.24E-04	3.55E-06	0.00E+00	0.00E+00
R32		0.00E+00	1.12E-04	4.92E-05	0.00E+00	0.00E+00	2.81E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
R33		0.00E+00	0.00E+00	9.44E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.71E-04	1.74E-05	0.00E+00	4.19E-05	2.10E-05	1.18E-05	0.00E+00	0.00E+00
R34		0.00E+00	0.00E+00	1.56E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.22E-04	0.00E+00	0.00E+00	7.22E-05	3.61E-05	0.00E+00	0.00E+00	0.00E+00
R35		0.00E+00	0.00E+00	1.57E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.80E-04	0.00E+00	0.00E+00	1.18E-04	5.89E-05	0.00E+00	0.00E+00	0.00E+00
R36		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.93E-02	0.00E+00	0.00E+00	1.81E-03	1.81E-03	0.00E+00	0.00E+00	0.00E+00
R37																
R38		0.00E+00	3.83E-02	4.10E-03	0.00E+00	0.00E+00	1.36E-03	0.00E+00	1.38E-01	3.25E-03	0.00E+00	3.21E-03	2.70E-03	2.64E-04	0.00E+00	0.00E+00
R39		0.00E+00	9.19E-01	9.85E-02	0.00E+00	0.00E+00	3.27E-02	0.00E+00	3.32E+00	7.80E-02	0.00E+00	7.69E-02	6.49E-02	6.33E-03	0.00E+00	0.00E+00
R40																
R41																
R42																4.60E+00
																1679

Row 1 (R1) shows the specific componet types.
Row 3 (R3) shows the number of proposed components for the emissions unit per component type. Number includes a 20% contingency.
Rows R5 through R11 shows the historical percentages of leaking components for the listed screening level ranges shown in column 1 (C1).
Rows R13 through R19 shows the number of components for each screening level range based on the historical percentages of leaking components.
Rows R22 through 28 show the CAPCOA correlaiton equation derived emissions factors (lb/hr/component). The screening values used in the equation are shown in C1.
Rows R30 through R36 show the emissions (lb/hr) per component type per screening level range.
Row R38 shows the total lb/hr emisions per component type for all screening value ranges.
Row R39 shows the total lb/day emisions per component type for all screening value ranges.
Row 41 shows the total lb/day emissions for the emissions unit.
Row 42 shows the total lb/yr emissions for the emissions unit.

Fugitive Emissions - VGO HDS, Amine Absorber Permit Unit S-33-408

	C1	C2	C3	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15
R1		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)
R2																
R3		0	230.85	141.75	0	0	0	0	341.55	209.25	0	0	4.05	4.05	0	0
R4																
R5	<100	0.9864	0.9992	0.9901	0.5561	0.5561	0.7188	0.9946	0.9946	0.9946	0.7063	0.8756	0.8756	0.9901	0.9867	0.9867
R6	<500	0.0046	0.0004	0.0030	0.4089	0.4089	0.2760	0.0045	0.0045	0.0045	0.2727	0.1096	0.1096	0.0030	0.0111	0.0111
R7	<1,000	0.0021	0.0004	0.0017	0.0142	0.0142	0.0052	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0017	0.0002	0.0002
R8	<2,000	0.0033	0.0000	0.0020	0.0099	0.0099	0.0000	0.0004	0.0004	0.0004	0.0000	0.0040	0.0040	0.0020	0.0008	0.0008
R9	<5,000	0.0024	0.0000	0.0018	0.0056	0.0056	0.0000	0.0001	0.0001	0.0001	0.0000	0.0040	0.0040	0.0018	0.0006	0.0006
R10	<10,000	0.0011	0.0000	0.0011	0.0039	0.0039	0.0000	0.0001	0.0001	0.0001	0.0070	0.0045	0.0045	0.0011	0.0005	0.0005
R11	Pegged	0.0002	0.0000	0.0001	0.0013	0.0013	0.0000	0.0002	0.0002	0.0002	0.0140	0.0023	0.0023	0.0001	0.0001	0.0001
R12																
R13		0.00	230.67	140.35	0.00	0.00	0.00	0.00	339.71	208.12	0.00	0.00	3.55	4.01	0.00	0.00
R14		0.00	0.09	0.43	0.00	0.00	0.00	0.00	1.54	0.94	0.00	0.00	0.44	0.01	0.00	0.00
R15		0.00	0.09	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
R16		0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.14	0.08	0.00	0.00	0.02	0.01	0.00	0.00
R17		0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.03	0.02	0.00	0.00	0.02	0.01	0.00	0.00
R18		0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.03	0.02	0.00	0.00	0.02	0.00	0.00	0.00
R19		0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.07	0.04	0.00	0.00	0.01	0.00	0.00	0.00
R20																
R21		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)
R22	50	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	1.58E-04	1.58E-04	1.58E-04	2.36E-04	2.36E-04	2.36E-04	9.30E-05	6.00E-05	6.00E-05
R23	300	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	5.60E-04	5.60E-04	5.60E-04	7.46E-04	7.46E-04	7.46E-04	3.55E-04	2.24E-04	2.24E-04
R24	750	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	1.07E-03	1.07E-03	1.07E-03	1.34E-03	1.34E-03	1.34E-03	7.03E-04	4.41E-04	4.41E-04
R25	1500	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.74E-03	1.74E-03	1.74E-03	2.10E-03	2.10E-03	2.10E-03	1.18E-03	7.34E-04	7.34E-04
R26	3500	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	3.17E-03	3.17E-03	3.17E-03	3.61E-03	3.61E-03	3.61E-03	2.22E-03	1.37E-03	1.37E-03
R27	7500	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	5.44E-03	5.44E-03	5.44E-03	5.89E-03	5.89E-03	5.89E-03	3.93E-03	2.40E-03	2.40E-03
R28	Pegged	0.141	0.141	0.141	0.196	0.196	0.196	0.209	0.209	0.209	0.181	0.181	0.181	0.141	0.066	0.066
R29																
R30		0.00E+00	2.15E-02	1.31E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.37E-02	3.29E-02	0.00E+00	0.00E+00	8.38E-04	3.73E-04	0.00E+00	0.00E+00
R31		0.00E+00	3.19E-05	1.52E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.63E-04	5.27E-04	0.00E+00	0.00E+00	3.28E-04	3.55E-06	0.00E+00	0.00E+00
R32		0.00E+00	6.33E-05	1.69E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.03E-06	0.00E+00	0.00E+00
R33		0.00E+00	0.00E+00	3.30E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.44E-04	1.40E-04	0.00E+00	0.00E+00	4.19E-05	1.18E-05	0.00E+00	0.00E+00
R34		0.00E+00	0.00E+00	5.78E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.52E-05	6.35E-05	0.00E+00	0.00E+00	7.22E-05	2.22E-05	0.00E+00	0.00E+00
R35		0.00E+00	0.00E+00	6.28E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.63E-04	1.09E-04	0.00E+00	0.00E+00	1.18E-04	0.00E+00	0.00E+00	0.00E+00
R36		0.00E+00	0.00E+00	1.41E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.47E-02	8.38E-03	0.00E+00	0.00E+00	1.81E-03	0.00E+00	0.00E+00	0.00E+00
R37																
R38		0.00E+00	2.15E-02	1.63E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.97E-02	4.21E-02	0.00E+00	0.00E+00	3.21E-03	4.18E-04	0.00E+00	0.00E+00
R39		0.00E+00	5.17E-01	3.92E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.67E+00	1.01E+00	0.00E+00	0.00E+00	7.69E-02	1.00E-02	0.00E+00	0.00E+00
R40																
R41																3.70E+00
R42																1351

Row 1 (R1) shows the specific componet types.
Row 3 (R3) shows the number of proposed components for the emissions unit per component type. Number includes a 20% contingency.
Rows R5 through R11 shows the historical percentages of leaking components for the listed screening level ranges shown in column 1 (C1).
Rows R13 through R19 shows the number of components for each screening level range based on the historical percentages of leaking components.
Rows R22 through 28 show the CAPCOA correlaiton equation derived emissions factors (lb/hr/component). The screening values used in the equation are shown in C1.
Rows R30 through R36 show the emissions (lb/hr) per component type per screening level range.
Row R38 shows the total lb/hr emisions per component type for all screening value ranges.
Row R39 shows the total lb/day emisions per component type for all screening value ranges.
Row 41 shows the total lb/day emissions for the emissions unit.
Row 42 shows the total lb/yr emissions for the emissions unit.

Fugitive Emissions - VGO HDS, Coker Fuel Gas Treater, Permit Unit S-33-408

	C1	C2	C3	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15
R1		V (LL)	V (HL)	V (V)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (HL)	SC (V)
R2																
R3		0	78.3	62.1	0	0	2.7	0	195.75	218.7	0	0	6.75	0	16.2	0
R4																
R5	<100	0.9864	0.9992	0.9901	0.5561	0.5561	0.7188	0.9946	0.9946	0.9946	0.7063	0.8756	0.8756	0.9901	0.9867	0.9867
R6	<500	0.0046	0.0004	0.0030	0.4089	0.4089	0.2760	0.0045	0.0045	0.0045	0.2727	0.1096	0.1096	0.0030	0.0111	0.0111
R7	<1,000	0.0021	0.0004	0.0017	0.0142	0.0142	0.0052	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0017	0.0002	0.0002
R8	<2,000	0.0033	0.0000	0.0020	0.0099	0.0099	0.0000	0.0004	0.0004	0.0004	0.0000	0.0040	0.0040	0.0020	0.0008	0.0008
R9	<5,000	0.0024	0.0000	0.0018	0.0056	0.0056	0.0000	0.0001	0.0001	0.0001	0.0000	0.0040	0.0040	0.0018	0.0006	0.0006
R10	<10,000	0.0011	0.0000	0.0011	0.0039	0.0039	0.0000	0.0001	0.0001	0.0001	0.0070	0.0045	0.0045	0.0011	0.0005	0.0005
R11	Pegged	0.0002	0.0000	0.0001	0.0013	0.0013	0.0000	0.0002	0.0002	0.0002	0.0140	0.0023	0.0023	0.0001	0.0001	0.0001
R12																
R13		0.00	78.24	61.49	0.00	0.00	1.94	0.00	194.69	217.52	0.00	0.00	5.91	0.00	15.98	0.00
R14		0.00	0.03	0.19	0.00	0.00	0.75	0.00	0.88	0.98	0.00	0.00	0.74	0.00	0.18	0.00
R15		0.00	0.03	0.11	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
R16		0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.08	0.09	0.00	0.00	0.03	0.00	0.01	0.00
R17		0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.03	0.00	0.01	0.00
R18		0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.03	0.00	0.01	0.00
R19		0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.04	0.04	0.00	0.00	0.02	0.00	0.00	0.00
R20																
R21		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)
R22	50	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	1.58E-04	1.58E-04	1.58E-04	2.36E-04	2.36E-04	2.36E-04	9.30E-05	6.00E-05	6.00E-05
R23	300	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	5.60E-04	5.60E-04	5.60E-04	7.46E-04	7.46E-04	7.46E-04	3.55E-04	2.24E-04	2.24E-04
R24	750	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	1.07E-03	1.07E-03	1.07E-03	1.34E-03	1.34E-03	1.34E-03	7.03E-04	4.41E-04	4.41E-04
R25	1500	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.74E-03	1.74E-03	1.74E-03	2.10E-03	2.10E-03	2.10E-03	1.18E-03	7.34E-04	7.34E-04
R26	3500	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	3.17E-03	3.17E-03	3.17E-03	3.61E-03	3.61E-03	3.61E-03	2.22E-03	1.37E-03	1.37E-03
R27	7500	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	5.44E-03	5.44E-03	5.44E-03	5.89E-03	5.89E-03	5.89E-03	3.93E-03	2.40E-03	2.40E-03
R28	Pegged	0.141	0.141	0.141	0.196	0.196	0.196	0.209	0.209	0.209	0.181	0.181	0.181	0.141	0.066	0.066
R29																
R30		0.00E+00	7.28E-03	5.72E-03	0.00E+00	0.00E+00	1.80E-04	0.00E+00	3.08E-02	3.44E-02	0.00E+00	0.00E+00	1.40E-03	0.00E+00	9.59E-04	0.00E+00
R31		0.00E+00	1.06E-05	6.74E-05	0.00E+00	0.00E+00	2.66E-04	0.00E+00	4.93E-04	5.49E-04	0.00E+00	0.00E+00	5.52E-04	0.00E+00	4.04E-05	0.00E+00
R32		0.00E+00	2.11E-05	7.73E-05	0.00E+00	0.00E+00	7.03E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
R33		0.00E+00	0.00E+00	1.42E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.40E-04	1.57E-04	0.00E+00	0.00E+00	6.29E-05	0.00E+00	7.34E-06	0.00E+00
R34		0.00E+00	0.00E+00	2.44E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.35E-05	6.35E-05	0.00E+00	0.00E+00	1.08E-04	0.00E+00	1.37E-05	0.00E+00
R35		0.00E+00	0.00E+00	2.75E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.09E-04	1.09E-04	0.00E+00	0.00E+00	1.77E-04	0.00E+00	2.40E-05	0.00E+00
R36		0.00E+00	0.00E+00	1.41E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.38E-03	8.38E-03	0.00E+00	0.00E+00	3.62E-03	0.00E+00	0.00E+00	0.00E+00
R37																
R38		0.00E+00	7.31E-03	7.94E-03	0.00E+00	0.00E+00	4.53E-04	0.00E+00	4.00E-02	4.36E-02	0.00E+00	0.00E+00	5.91E-03	0.00E+00	1.04E-03	0.00E+00
R39		0.00E+00	1.75E-01	1.90E-01	0.00E+00	0.00E+00	1.09E-02	0.00E+00	9.59E-01	1.05E+00	0.00E+00	0.00E+00	1.42E-01	0.00E+00	2.51E-02	0.00E+00
R40																
R41																2.60E+00
R42																949

Row 1 (R1) shows the specific componet types.
Row 3 (R3) shows the number of proposed components for the emissions unit per component type. Number includes a 20% contingency.
Rows R5 through R11 shows the historical percentages of leaking components for the listed screening level ranges shown in column 1 (C1).
Rows R13 through R19 shows the number of components for each screening level range based on the historical percentages of leaking components.
Rows R22 through 28 show the CAPCOA correlaiton equation derived emissions factors (lb/hr/component). The screening values used in the equation are shown in C1.
Rows R30 through R36 show the emissions (lb/hr) per component type per screening level range.
Row R38 shows the total lb/hr emisions per component type for all screening value ranges.
Row R39 shows the total lb/day emisions per component type for all screening value ranges.
Row 41 shows the total lb/day emissions for the emissions unit.
Row 42 shows the total lb/yr emissions for the emissions unit.

Fugitive Emissions - VGO HDS, Pipeline, Permit Unit S-33-408

	C1	C2	C3	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15
R1		V (LL)	V (HL)	V (V)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (V)
R2																
R3		43.2	0	0	0	2.7	0	94.5	0	0	0	0	0	0	33.75	0
R4																
R5	<100	0.9864	0.9992	0.9901	0.5561	0.5561	0.7188	0.9946	0.9946	0.9946	0.7063	0.8756	0.8756	0.9901	0.9867	0.9867
R6	<500	0.0046	0.0004	0.0030	0.4089	0.4089	0.2760	0.0045	0.0045	0.0045	0.2727	0.1096	0.1096	0.0030	0.0111	0.0111
R7	<1,000	0.0021	0.0004	0.0017	0.0142	0.0142	0.0052	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0017	0.0002	0.0002
R8	<2,000	0.0033	0.0000	0.0020	0.0099	0.0099	0.0000	0.0004	0.0004	0.0004	0.0000	0.0040	0.0040	0.0020	0.0008	0.0008
R9	<5,000	0.0024	0.0000	0.0018	0.0056	0.0056	0.0000	0.0001	0.0001	0.0001	0.0000	0.0040	0.0040	0.0018	0.0006	0.0006
R10	<10,000	0.0011	0.0000	0.0011	0.0039	0.0039	0.0000	0.0001	0.0001	0.0001	0.0070	0.0045	0.0045	0.0011	0.0005	0.0005
R11	Pegged	0.0002	0.0000	0.0001	0.0013	0.0013	0.0000	0.0002	0.0002	0.0002	0.0140	0.0023	0.0023	0.0001	0.0001	0.0001
R12																
R13		42.61	0.00	0.00	0.00	1.50	0.00	93.99	0.00	0.00	0.00	0.00	0.00	0.00	33.30	0.00
R14		0.20	0.00	0.00	0.00	1.10	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.00
R15		0.09	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
R16		0.14	0.00	0.00	0.00	0.03	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00
R17		0.10	0.00	0.00	0.00	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00
R18		0.05	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00
R19		0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
R20																
R21		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)
R22	50	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	1.58E-04	1.58E-04	1.58E-04	2.36E-04	2.36E-04	2.36E-04	9.30E-05	6.00E-05	6.00E-05
R23	300	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	5.60E-04	5.60E-04	5.60E-04	7.46E-04	7.46E-04	7.46E-04	3.55E-04	2.24E-04	2.24E-04
R24	750	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	1.07E-03	1.07E-03	1.07E-03	1.34E-03	1.34E-03	1.34E-03	7.03E-04	4.41E-04	4.41E-04
R25	1500	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.74E-03	1.74E-03	1.74E-03	2.10E-03	2.10E-03	2.10E-03	1.18E-03	7.34E-04	7.34E-04
R26	3500	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	3.17E-03	3.17E-03	3.17E-03	3.61E-03	3.61E-03	3.61E-03	2.22E-03	1.37E-03	1.37E-03
R27	7500	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	5.44E-03	5.44E-03	5.44E-03	5.89E-03	5.89E-03	5.89E-03	3.93E-03	2.40E-03	2.40E-03
R28	Pegged	0.141	0.141	0.141	0.196	0.196	0.196	0.209	0.209	0.209	0.181	0.181	0.181	0.141	0.066	0.066
R29																
R30		3.96E-03	0.00E+00	0.00E+00	0.00E+00	1.40E-04	0.00E+00	1.49E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E-03	0.00E+00
R31		7.09E-05	0.00E+00	0.00E+00	0.00E+00	3.90E-04	0.00E+00	2.41E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.31E-05	0.00E+00
R32		6.33E-05	0.00E+00	0.00E+00	0.00E+00	2.81E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.41E-06	0.00E+00
R33		1.65E-04	0.00E+00	0.00E+00	0.00E+00	3.54E-05	0.00E+00	6.98E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.20E-05	0.00E+00
R34		2.22E-04	0.00E+00	0.00E+00	0.00E+00	4.44E-05	0.00E+00	3.17E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.74E-05	0.00E+00
R35		1.96E-04	0.00E+00	0.00E+00	0.00E+00	3.93E-05	0.00E+00	5.44E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.80E-05	0.00E+00
R36		1.41E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.19E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
R37																
R38		6.09E-03	0.00E+00	0.00E+00	0.00E+00	6.77E-04	0.00E+00	1.94E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.18E-03	0.00E+00
R39		1.46E-01	0.00E+00	0.00E+00	0.00E+00	1.62E-02	0.00E+00	4.67E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.24E-02	0.00E+00
R40																
R41																7.00E-01
R42																256

Row 1 (R1) shows the specific componet types.
Row 3 (R3) shows the number of proposed components for the emissions unit per component type. Number includes a 20% contingency.
Rows R5 through R11 shows the historical percentages of leaking components for the listed screening level ranges shown in column 1 (C1).
Rows R13 through R19 shows the number of components for each screening level range based on the historical percentages of leaking components.
Rows R22 through 28 show the CAPCOA correlaiton equation derived emissions factors (lb/hr/component). The screening values used in the equation are shown in C1.
Rows R30 through R36 show the emissions (lb/hr) per component type per screening level range.
Row R38 shows the total lb/hr emisions per component type for all screening value ranges.
Row R39 shows the total lb/day emisions per component type for all screening value ranges.
Row 41 shows the total lb/day emissions for the emissions unit.
Row 42 shows the total lb/yr emissions for the emissions unit.

FCCU Reactor/Regenerator, Permit Unit S-33-410

	C1	C2	C3	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15
R1		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)
R2																
R3		21.6	106.65	149.85	0	0	0	66.15	325.35	457.65	0	0	1.35	0	0	0
R4																
R5	<100	0.9864	0.9992	0.9901	0.5561	0.5561	0.7188	0.9946	0.9946	0.9946	0.7063	0.8756	0.8756	0.9901	0.9867	0.9867
R6	<500	0.0046	0.0004	0.0030	0.4089	0.4089	0.2760	0.0045	0.0045	0.0045	0.2727	0.1096	0.1096	0.0030	0.0111	0.0111
R7	<1,000	0.0021	0.0004	0.0017	0.0142	0.0142	0.0052	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0017	0.0002	0.0002
R8	<2,000	0.0033	0.0000	0.0020	0.0099	0.0099	0.0000	0.0004	0.0004	0.0004	0.0000	0.0040	0.0040	0.0020	0.0008	0.0008
R9	<5,000	0.0024	0.0000	0.0018	0.0056	0.0056	0.0000	0.0001	0.0001	0.0001	0.0000	0.0040	0.0040	0.0018	0.0006	0.0006
R10	<10,000	0.0011	0.0000	0.0011	0.0039	0.0039	0.0000	0.0001	0.0001	0.0001	0.0070	0.0045	0.0045	0.0011	0.0005	0.0005
R11	Pegged	0.0002	0.0000	0.0001	0.0013	0.0013	0.0000	0.0002	0.0002	0.0002	0.0140	0.0023	0.0023	0.0001	0.0001	0.0001
R12																
R13		21.31	106.56	148.37	0.00	0.00	0.00	65.79	323.59	455.18	0.00	0.00	1.18	0.00	0.00	0.00
R14		0.10	0.04	0.45	0.00	0.00	0.00	0.30	1.46	2.06	0.00	0.00	0.15	0.00	0.00	0.00
R15		0.05	0.04	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
R16		0.07	0.00	0.30	0.00	0.00	0.00	0.03	0.13	0.18	0.00	0.00	0.01	0.00	0.00	0.00
R17		0.05	0.00	0.27	0.00	0.00	0.00	0.01	0.03	0.05	0.00	0.00	0.01	0.00	0.00	0.00
R18		0.02	0.00	0.16	0.00	0.00	0.00	0.01	0.03	0.05	0.00	0.00	0.01	0.00	0.00	0.00
R19		0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.07	0.09	0.00	0.00	0.00	0.00	0.00	0.00
R20																
R21		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)
R22	50	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	1.58E-04	1.58E-04	1.58E-04	2.36E-04	2.36E-04	2.36E-04	9.30E-05	6.00E-05	6.00E-05
R23	300	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	5.60E-04	5.60E-04	5.60E-04	7.46E-04	7.46E-04	7.46E-04	3.55E-04	2.24E-04	2.24E-04
R24	750	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	1.07E-03	1.07E-03	1.07E-03	1.34E-03	1.34E-03	1.34E-03	7.03E-04	4.41E-04	4.41E-04
R25	1500	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.74E-03	1.74E-03	1.74E-03	2.10E-03	2.10E-03	2.10E-03	1.18E-03	7.34E-04	7.34E-04
R26	3500	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	3.17E-03	3.17E-03	3.17E-03	3.61E-03	3.61E-03	3.61E-03	2.22E-03	1.37E-03	1.37E-03
R27	7500	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	5.44E-03	5.44E-03	5.44E-03	5.89E-03	5.89E-03	5.89E-03	3.93E-03	2.40E-03	2.40E-03
R28	Pegged	0.141	0.141	0.141	0.196	0.196	0.196	0.209	0.209	0.209	0.181	0.181	0.181	0.141	0.066	0.066
R29																
R30		1.98E-03	9.91E-03	1.38E-02	0.00E+00	0.00E+00	0.00E+00	1.04E-02	5.12E-02	7.20E-02	0.00E+00	0.00E+00	2.79E-04	0.00E+00	0.00E+00	0.00E+00
R31		3.55E-05	1.42E-05	1.60E-04	0.00E+00	0.00E+00	0.00E+00	1.68E-04	8.18E-04	1.15E-03	0.00E+00	0.00E+00	1.12E-04	0.00E+00	0.00E+00	0.00E+00
R32		3.52E-05	2.81E-05	1.76E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
R33		8.26E-05	0.00E+00	3.54E-04	0.00E+00	0.00E+00	0.00E+00	5.23E-05	2.27E-04	3.14E-04	0.00E+00	0.00E+00	2.10E-05	0.00E+00	0.00E+00	0.00E+00
R34		1.11E-04	0.00E+00	6.00E-04	0.00E+00	0.00E+00	0.00E+00	3.17E-05	9.52E-05	1.59E-04	0.00E+00	0.00E+00	3.61E-05	0.00E+00	0.00E+00	0.00E+00
R35		7.85E-05	0.00E+00	6.28E-04	0.00E+00	0.00E+00	0.00E+00	5.44E-05	1.63E-04	2.72E-04	0.00E+00	0.00E+00	5.89E-05	0.00E+00	0.00E+00	0.00E+00
R36		0.00E+00	0.00E+00	1.41E-03	0.00E+00	0.00E+00	0.00E+00	2.09E-03	1.47E-02	1.88E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
R37																
R38		2.32E-03	9.95E-03	1.71E-02	0.00E+00	0.00E+00	0.00E+00	1.28E-02	6.71E-02	9.27E-02	0.00E+00	0.00E+00	5.06E-04	0.00E+00	0.00E+00	0.00E+00
R39		5.58E-02	2.39E-01	4.11E-01	0.00E+00	0.00E+00	0.00E+00	3.07E-01	1.61E+00	2.22E+00	0.00E+00	0.00E+00	1.22E-02	0.00E+00	0.00E+00	0.00E+00
R40																
R41																4.90E+00
R42																1789

Row 1 (R1) shows the specific componet types.
Row 3 (R3) shows the number of proposed components for the emissions unit per component type. Number includes a 20% contingency.
Rows R5 through R11 shows the historical percentages of leaking components for the listed screening level ranges shown in column 1 (C1).
Rows R13 through R19 shows the number of components for each screening level range based on the historical percentages of leaking components.
Rows R22 through 28 show the CAPCOA correlaiton equation derived emissions factors (lb/hr/component). The screening values used in the equation are shown in C1.
Rows R30 through R36 show the emissions (lb/hr) per component type per screening level range.
Row R38 shows the total lb/hr emisions per component type for all screening value ranges.
Row R39 shows the total lb/day emisions per component type for all screening value ranges.
Row 41 shows the total lb/day emissions for the emissions unit.
Row 42 shows the total lb/yr emissions for the emissions unit.

FCCU Main Col, Permit Unit S-33-410

	C1	C2	C3	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15
R1		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)
R2																
R3		132.3	675	186.3	0	0	40.5	427.95	2268	260.55	0	0	13.5	0	1.35	6.75
R4																
R5	<100	0.9864	0.9992	0.9901	0.5561	0.5561	0.7188	0.9946	0.9946	0.9946	0.7063	0.8756	0.8756	0.9901	0.9867	0.9867
R6	<500	0.0046	0.0004	0.0030	0.4089	0.4089	0.2760	0.0045	0.0045	0.0045	0.2727	0.1096	0.1096	0.0030	0.0111	0.0111
R7	<1,000	0.0021	0.0004	0.0017	0.0142	0.0142	0.0052	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0017	0.0002	0.0002
R8	<2,000	0.0033	0.0000	0.0020	0.0099	0.0099	0.0000	0.0004	0.0004	0.0004	0.0000	0.0040	0.0040	0.0020	0.0008	0.0008
R9	<5,000	0.0024	0.0000	0.0018	0.0056	0.0056	0.0000	0.0001	0.0001	0.0001	0.0000	0.0040	0.0040	0.0018	0.0006	0.0006
R10	<10,000	0.0011	0.0000	0.0011	0.0039	0.0039	0.0000	0.0001	0.0001	0.0001	0.0070	0.0045	0.0045	0.0011	0.0005	0.0005
R11	Pegged	0.0002	0.0000	0.0001	0.0013	0.0013	0.0000	0.0002	0.0002	0.0002	0.0140	0.0023	0.0023	0.0001	0.0001	0.0001
R12																
R13		130.50	674.46	184.46	0.00	0.00	29.11	425.64	2255.75	259.14	0.00	0.00	11.82	0.00	1.33	6.66
R14		0.61	0.27	0.56	0.00	0.00	11.18	1.93	10.21	1.17	0.00	0.00	1.48	0.00	0.01	0.07
R15		0.28	0.27	0.32	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
R16		0.44	0.00	0.37	0.00	0.00	0.00	0.17	0.91	0.10	0.00	0.00	0.05	0.00	0.00	0.01
R17		0.32	0.00	0.34	0.00	0.00	0.00	0.04	0.23	0.03	0.00	0.00	0.05	0.00	0.00	0.00
R18		0.15	0.00	0.20	0.00	0.00	0.00	0.04	0.23	0.03	0.00	0.00	0.06	0.00	0.00	0.00
R19		0.03	0.00	0.02	0.00	0.00	0.00	0.09	0.45	0.05	0.00	0.00	0.03	0.00	0.00	0.00
R20																
R21		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)
R22	50	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	1.58E-04	1.58E-04	1.58E-04	2.36E-04	2.36E-04	2.36E-04	9.30E-05	6.00E-05	6.00E-05
R23	300	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	5.60E-04	5.60E-04	5.60E-04	7.46E-04	7.46E-04	7.46E-04	3.55E-04	2.24E-04	2.24E-04
R24	750	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	1.07E-03	1.07E-03	1.07E-03	1.34E-03	1.34E-03	1.34E-03	7.03E-04	4.41E-04	4.41E-04
R25	1500	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.74E-03	1.74E-03	1.74E-03	2.10E-03	2.10E-03	2.10E-03	1.18E-03	7.34E-04	7.34E-04
R26	3500	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	3.17E-03	3.17E-03	3.17E-03	3.61E-03	3.61E-03	3.61E-03	2.22E-03	1.37E-03	1.37E-03
R27	7500	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	5.44E-03	5.44E-03	5.44E-03	5.89E-03	5.89E-03	5.89E-03	3.93E-03	2.40E-03	2.40E-03
R28	Pegged	0.141	0.141	0.141	0.196	0.196	0.196	0.209	0.209	0.209	0.181	0.181	0.181	0.141	0.066	0.066
R29																
R30		1.21E-02	6.27E-02	1.72E-02	0.00E+00	0.00E+00	2.71E-03	6.73E-02	3.57E-01	4.10E-02	0.00E+00	0.00E+00	2.79E-03	0.00E+00	7.99E-05	4.00E-04
R31		2.16E-04	9.57E-05	1.99E-04	0.00E+00	0.00E+00	3.96E-03	1.08E-03	5.72E-03	6.55E-04	0.00E+00	0.00E+00	1.10E-03	0.00E+00	2.24E-06	1.57E-05
R32		1.97E-04	1.90E-04	2.25E-04	0.00E+00	0.00E+00	1.48E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
R33		5.19E-04	0.00E+00	4.37E-04	0.00E+00	0.00E+00	0.00E+00	2.97E-04	1.59E-03	1.74E-04	0.00E+00	0.00E+00	1.05E-04	0.00E+00	0.00E+00	7.34E-06
R34		7.11E-04	0.00E+00	7.56E-04	0.00E+00	0.00E+00	0.00E+00	1.27E-04	7.30E-04	9.52E-05	0.00E+00	0.00E+00	1.81E-04	0.00E+00	0.00E+00	0.00E+00
R35		5.89E-04	0.00E+00	7.85E-04	0.00E+00	0.00E+00	0.00E+00	2.17E-04	1.25E-03	1.63E-04	0.00E+00	0.00E+00	3.53E-04	0.00E+00	0.00E+00	0.00E+00
R36		4.23E-03	0.00E+00	2.82E-03	0.00E+00	0.00E+00	0.00E+00	1.88E-02	9.42E-02	1.05E-02	0.00E+00	0.00E+00	5.42E-03	0.00E+00	0.00E+00	0.00E+00
R37																
R38		1.86E-02	6.30E-02	2.24E-02	0.00E+00	0.00E+00	6.82E-03	8.79E-02	4.60E-01	5.25E-02	0.00E+00	0.00E+00	9.96E-03	0.00E+00	8.21E-05	4.23E-04
R39		4.46E-01	1.51E+00	5.37E-01	0.00E+00	0.00E+00	1.64E-01	2.11E+00	1.10E+01	1.26E+00	0.00E+00	0.00E+00	2.39E-01	0.00E+00	1.97E-03	1.02E-02
R40																
R41																1.73E+01
R42																6315

Row 1 (R1) shows the specific componet types.
Row 3 (R3) shows the number of proposed components for the emissions unit per component type. Number includes a 20% contingency.
Rows R5 through R11 shows the historical percentages of leaking components for the listed screening level ranges shown in column 1 (C1).
Rows R13 through R19 shows the number of components for each screening level range based on the historical percentages of leaking components.
Rows R22 through 28 show the CAPCOA correlaiton equation derived emissions factors (lb/hr/component). The screening values used in the equation are shown in C1.
Rows R30 through R36 show the emissions (lb/hr) per component type per screening level range.
Row R38 shows the total lb/hr emisions per component type for all screening value ranges.
Row R39 shows the total lb/day emisions per component type for all screening value ranges.
Row 41 shows the total lb/day emissions for the emissions unit.
Row 42 shows the total lb/yr emissions for the emissions unit.

FCCU Gas Cont, Permit Unit S-33-410

	C1	C2	C3	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15
R1		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)
R2																
R3		541.35	14.85	302.4	37.8	0	0	1976.4	52.65	719.55	5.4	0	13.5	0	12.15	0
R4																
R5	<100	0.9864	0.9992	0.9901	0.5561	0.5561	0.7188	0.9946	0.9946	0.9946	0.7063	0.8756	0.8756	0.9901	0.9867	0.9867
R6	<500	0.0046	0.0004	0.0030	0.4089	0.4089	0.2760	0.0045	0.0045	0.0045	0.2727	0.1096	0.1096	0.0030	0.0111	0.0111
R7	<1,000	0.0021	0.0004	0.0017	0.0142	0.0142	0.0052	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0017	0.0002	0.0002
R8	<2,000	0.0033	0.0000	0.0020	0.0099	0.0099	0.0000	0.0004	0.0004	0.0004	0.0000	0.0040	0.0040	0.0020	0.0008	0.0008
R9	<5,000	0.0024	0.0000	0.0018	0.0056	0.0056	0.0000	0.0001	0.0001	0.0001	0.0000	0.0040	0.0040	0.0018	0.0006	0.0006
R10	<10,000	0.0011	0.0000	0.0011	0.0039	0.0039	0.0000	0.0001	0.0001	0.0001	0.0070	0.0045	0.0045	0.0011	0.0005	0.0005
R11	Pegged	0.0002	0.0000	0.0001	0.0013	0.0013	0.0000	0.0002	0.0002	0.0002	0.0140	0.0023	0.0023	0.0001	0.0001	0.0001
R12																
R13		533.99	14.84	299.41	21.02	0.00	0.00	1965.73	52.37	715.66	3.81	0.00	11.82	0.00	11.99	0.00
R14		2.49	0.01	0.91	15.46	0.00	0.00	8.89	0.24	3.24	1.47	0.00	1.48	0.00	0.13	0.00
R15		1.14	0.01	0.51	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
R16		1.79	0.00	0.60	0.37	0.00	0.00	0.79	0.02	0.29	0.00	0.00	0.05	0.00	0.01	0.00
R17		1.30	0.00	0.54	0.21	0.00	0.00	0.20	0.01	0.07	0.00	0.00	0.05	0.00	0.01	0.00
R18		0.60	0.00	0.33	0.15	0.00	0.00	0.20	0.01	0.07	0.04	0.00	0.06	0.00	0.01	0.00
R19		0.11	0.00	0.03	0.05	0.00	0.00	0.40	0.01	0.14	0.08	0.00	0.03	0.00	0.00	0.00
R20																
R21		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)
R22	50	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	1.58E-04	1.58E-04	1.58E-04	2.36E-04	2.36E-04	2.36E-04	9.30E-05	6.00E-05	6.00E-05
R23	300	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	5.60E-04	5.60E-04	5.60E-04	7.46E-04	7.46E-04	7.46E-04	3.55E-04	2.24E-04	2.24E-04
R24	750	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	1.07E-03	1.07E-03	1.07E-03	1.34E-03	1.34E-03	1.34E-03	7.03E-04	4.41E-04	4.41E-04
R25	1500	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.74E-03	1.74E-03	1.74E-03	2.10E-03	2.10E-03	2.10E-03	1.18E-03	7.34E-04	7.34E-04
R26	3500	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	3.17E-03	3.17E-03	3.17E-03	3.61E-03	3.61E-03	3.61E-03	2.22E-03	1.37E-03	1.37E-03
R27	7500	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	5.44E-03	5.44E-03	5.44E-03	5.89E-03	5.89E-03	5.89E-03	3.93E-03	2.40E-03	2.40E-03
R28	Pegged	0.141	0.141	0.141	0.196	0.196	0.196	0.209	0.209	0.209	0.181	0.181	0.181	0.141	0.066	0.066
R29																
R30		4.97E-02	1.38E-03	2.78E-02	1.95E-03	0.00E+00	0.00E+00	3.11E-01	8.28E-03	1.13E-01	9.00E-04	0.00E+00	2.79E-03	0.00E+00	7.20E-04	0.00E+00
R31		8.83E-04	3.55E-06	3.23E-04	5.48E-03	0.00E+00	0.00E+00	4.98E-03	1.34E-04	1.81E-03	1.10E-03	0.00E+00	1.10E-03	0.00E+00	2.92E-05	0.00E+00
R32		8.02E-04	7.03E-06	3.59E-04	3.80E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
R33		2.11E-03	0.00E+00	7.08E-04	4.37E-04	0.00E+00	0.00E+00	1.38E-03	3.49E-05	5.06E-04	0.00E+00	0.00E+00	1.05E-04	0.00E+00	7.34E-06	0.00E+00
R34		2.89E-03	0.00E+00	1.20E-03	4.67E-04	0.00E+00	0.00E+00	6.35E-04	3.17E-05	2.22E-04	0.00E+00	0.00E+00	1.81E-04	0.00E+00	1.37E-05	0.00E+00
R35		2.36E-03	0.00E+00	1.30E-03	5.89E-04	0.00E+00	0.00E+00	1.09E-03	5.44E-05	3.80E-04	2.36E-04	0.00E+00	3.53E-04	0.00E+00	2.40E-05	0.00E+00
R36		1.55E-02	0.00E+00	4.23E-03	9.81E-03	0.00E+00	0.00E+00	8.38E-02	2.09E-03	2.93E-02	1.45E-02	0.00E+00	5.42E-03	0.00E+00	0.00E+00	0.00E+00
R37																
R38		7.42E-02	1.39E-03	3.60E-02	1.91E-02	0.00E+00	0.00E+00	4.03E-01	1.06E-02	1.45E-01	1.67E-02	0.00E+00	9.96E-03	0.00E+00	7.94E-04	0.00E+00
R39		1.78E+00	3.34E-02	8.63E-01	4.59E-01	0.00E+00	0.00E+00	9.66E+00	2.55E-01	3.49E+00	4.01E-01	0.00E+00	2.39E-01	0.00E+00	1.91E-02	0.00E+00
R40																
R41																1.72E+01
R42																6278

Row 1 (R1) shows the specific componet types.
Row 3 (R3) shows the number of proposed components for the emissions unit per component type. Number includes a 20% contingency.
Rows R5 through R11 shows the historical percentages of leaking components for the listed screening level ranges shown in column 1 (C1).
Rows R13 through R19 shows the number of components for each screening level range based on the historical percentages of leaking components.
Rows R22 through 28 show the CAPCOA correlaiton equation derived emissions factors (lb/hr/component). The screening values used in the equation are shown in C1.
Rows R30 through R36 show the emissions (lb/hr) per component type per screening level range.
Row R38 shows the total lb/hr emisions per component type for all screening value ranges.
Row R39 shows the total lb/day emisions per component type for all screening value ranges.
Row 41 shows the total lb/day emissions for the emissions unit.
Row 42 shows the total lb/yr emissions for the emissions unit.

LPG Merox Unit, Permit Unit S-33-411

	C1	C2	C3	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15
R1		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)
R2																
R3		438.75	0	128.25	20.25	0	0	1375.65	0	226.8	0	0	21.6	0	12.15	0
R4																
R5	<100	0.9864	0.9992	0.9901	0.5561	0.5561	0.7188	0.9946	0.9946	0.9946	0.7063	0.8756	0.8756	0.9901	0.9867	0.9867
R6	<500	0.0046	0.0004	0.0030	0.4089	0.4089	0.2760	0.0045	0.0045	0.0045	0.2727	0.1096	0.1096	0.0030	0.0111	0.0111
R7	<1,000	0.0021	0.0004	0.0017	0.0142	0.0142	0.0052	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0017	0.0002	0.0002
R8	<2,000	0.0033	0.0000	0.0020	0.0099	0.0099	0.0000	0.0004	0.0004	0.0004	0.0000	0.0040	0.0040	0.0020	0.0008	0.0008
R9	<5,000	0.0024	0.0000	0.0018	0.0056	0.0056	0.0000	0.0001	0.0001	0.0001	0.0000	0.0040	0.0040	0.0018	0.0006	0.0006
R10	<10,000	0.0011	0.0000	0.0011	0.0039	0.0039	0.0000	0.0001	0.0001	0.0001	0.0070	0.0045	0.0045	0.0011	0.0005	0.0005
R11	Pegged	0.0002	0.0000	0.0001	0.0013	0.0013	0.0000	0.0002	0.0002	0.0002	0.0140	0.0023	0.0023	0.0001	0.0001	0.0001
R12																
R13		432.78	0.00	126.98	11.26	0.00	0.00	1368.22	0.00	225.58	0.00	0.00	18.91	0.00	11.99	0.00
R14		2.02	0.00	0.38	8.28	0.00	0.00	6.19	0.00	1.02	0.00	0.00	2.37	0.00	0.13	0.00
R15		0.92	0.00	0.22	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
R16		1.45	0.00	0.26	0.20	0.00	0.00	0.55	0.00	0.09	0.00	0.00	0.09	0.00	0.01	0.00
R17		1.05	0.00	0.23	0.11	0.00	0.00	0.14	0.00	0.02	0.00	0.00	0.09	0.00	0.01	0.00
R18		0.48	0.00	0.14	0.08	0.00	0.00	0.14	0.00	0.02	0.00	0.00	0.10	0.00	0.01	0.00
R19		0.09	0.00	0.01	0.03	0.00	0.00	0.28	0.00	0.05	0.00	0.00	0.05	0.00	0.00	0.00
R20																
R21		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)
R22	50	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	1.58E-04	1.58E-04	1.58E-04	2.36E-04	2.36E-04	2.36E-04	9.30E-05	6.00E-05	6.00E-05
R23	300	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	5.60E-04	5.60E-04	5.60E-04	7.46E-04	7.46E-04	7.46E-04	3.55E-04	2.24E-04	2.24E-04
R24	750	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	1.07E-03	1.07E-03	1.07E-03	1.34E-03	1.34E-03	1.34E-03	7.03E-04	4.41E-04	4.41E-04
R25	1500	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.74E-03	1.74E-03	1.74E-03	2.10E-03	2.10E-03	2.10E-03	1.18E-03	7.34E-04	7.34E-04
R26	3500	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	3.17E-03	3.17E-03	3.17E-03	3.61E-03	3.61E-03	3.61E-03	2.22E-03	1.37E-03	1.37E-03
R27	7500	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	5.44E-03	5.44E-03	5.44E-03	5.89E-03	5.89E-03	5.89E-03	3.93E-03	2.40E-03	2.40E-03
R28	Pegged	0.141	0.141	0.141	0.196	0.196	0.196	0.209	0.209	0.209	0.181	0.181	0.181	0.141	0.066	0.066
R29																
R30		4.02E-02	0.00E+00	1.18E-02	1.05E-03	0.00E+00	0.00E+00	2.16E-01	0.00E+00	3.57E-02	0.00E+00	0.00E+00	4.46E-03	0.00E+00	7.20E-04	0.00E+00
R31		7.16E-04	0.00E+00	1.35E-04	2.94E-03	0.00E+00	0.00E+00	3.47E-03	0.00E+00	5.71E-04	0.00E+00	0.00E+00	1.77E-03	0.00E+00	2.92E-05	0.00E+00
R32		6.47E-04	0.00E+00	1.55E-04	2.04E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
R33		1.71E-03	0.00E+00	3.07E-04	2.36E-04	0.00E+00	0.00E+00	9.60E-04	0.00E+00	1.57E-04	0.00E+00	0.00E+00	1.89E-04	0.00E+00	7.34E-06	0.00E+00
R34		2.33E-03	0.00E+00	5.11E-04	2.44E-04	0.00E+00	0.00E+00	4.44E-04	0.00E+00	6.35E-05	0.00E+00	0.00E+00	3.25E-04	0.00E+00	1.37E-05	0.00E+00
R35		1.88E-03	0.00E+00	5.50E-04	3.14E-04	0.00E+00	0.00E+00	7.61E-04	0.00E+00	1.09E-04	0.00E+00	0.00E+00	5.89E-04	0.00E+00	2.40E-05	0.00E+00
R36		1.27E-02	0.00E+00	1.41E-03	5.89E-03	0.00E+00	0.00E+00	5.86E-02	0.00E+00	1.05E-02	0.00E+00	0.00E+00	9.04E-03	0.00E+00	0.00E+00	0.00E+00
R37																
R38		6.02E-02	0.00E+00	1.49E-02	1.09E-02	0.00E+00	0.00E+00	2.81E-01	0.00E+00	4.70E-02	0.00E+00	0.00E+00	1.64E-02	0.00E+00	7.94E-04	0.00E+00
R39		1.45E+00	0.00E+00	3.57E-01	2.61E-01	0.00E+00	0.00E+00	6.73E+00	0.00E+00	1.13E+00	0.00E+00	0.00E+00	3.93E-01	0.00E+00	1.91E-02	0.00E+00
R40																
R41																1.03E+01
R42																3760

Row 1 (R1) shows the specific componet types.
Row 3 (R3) shows the number of proposed components for the emissions unit per component type. Number includes a 20% contingency.
Rows R5 through R11 shows the historical percentages of leaking components for the listed screening level ranges shown in column 1 (C1).
Rows R13 through R19 shows the number of components for each screening level range based on the historical percentages of leaking components.
Rows R22 through 28 show the CAPCOA correlaiton equation derived emissions factors (lb/hr/component). The screening values used in the equation are shown in C1.
Rows R30 through R36 show the emissions (lb/hr) per component type per screening level range.
Row R38 shows the total lb/hr emisions per component type for all screening value ranges.
Row R39 shows the total lb/day emisions per component type for all screening value ranges.
Row 41 shows the total lb/day emissions for the emissions unit.
Row 42 shows the total lb/yr emissions for the emissions unit.

LPG Merox, Alkylation Unit, Permit Unit S-33-411

	C1	C2	C3	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15
R1		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)
R2																
R3		1650.6	79.9	646.8	38.4	0	0	4591.5	219.2	1539.4	0	0	47	0	28.2	1.6
R4																
R5	<100	0.9864	0.9992	0.9901	0.5561	0.5561	0.7188	0.9946	0.9946	0.9946	0.7063	0.8756	0.8756	0.9901	0.9867	0.9867
R6	<500	0.0046	0.0004	0.0030	0.4089	0.4089	0.2760	0.0045	0.0045	0.0045	0.2727	0.1096	0.1096	0.0030	0.0111	0.0111
R7	<1,000	0.0021	0.0004	0.0017	0.0142	0.0142	0.0052	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0017	0.0002	0.0002
R8	<2,000	0.0033	0.0000	0.0020	0.0099	0.0099	0.0000	0.0004	0.0004	0.0004	0.0000	0.0040	0.0040	0.0020	0.0008	0.0008
R9	<5,000	0.0024	0.0000	0.0018	0.0056	0.0056	0.0000	0.0001	0.0001	0.0001	0.0000	0.0040	0.0040	0.0018	0.0006	0.0006
R10	<10,000	0.0011	0.0000	0.0011	0.0039	0.0039	0.0000	0.0001	0.0001	0.0001	0.0070	0.0045	0.0045	0.0011	0.0005	0.0005
R11	Pegged	0.0002	0.0000	0.0001	0.0013	0.0013	0.0000	0.0002	0.0002	0.0002	0.0140	0.0023	0.0023	0.0001	0.0001	0.0001
R12																
R13		1628.15	79.84	640.40	21.35	0.00	0.00	4566.71	218.02	1531.09	0.00	0.00	41.15	0.00	27.82	1.58
R14		7.59	0.03	1.94	15.70	0.00	0.00	20.66	0.99	6.93	0.00	0.00	5.15	0.00	0.31	0.02
R15		3.47	0.03	1.10	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
R16		5.45	0.00	1.29	0.38	0.00	0.00	1.84	0.09	0.62	0.00	0.00	0.19	0.00	0.02	0.00
R17		3.96	0.00	1.16	0.22	0.00	0.00	0.46	0.02	0.15	0.00	0.00	0.19	0.00	0.02	0.00
R18		1.82	0.00	0.71	0.15	0.00	0.00	0.46	0.02	0.15	0.00	0.00	0.21	0.00	0.01	0.00
R19		0.33	0.00	0.06	0.05	0.00	0.00	0.92	0.04	0.31	0.00	0.00	0.11	0.00	0.00	0.00
R20																
R21		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)
R22	50	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	1.58E-04	1.58E-04	1.58E-04	2.36E-04	2.36E-04	2.36E-04	9.30E-05	6.00E-05	6.00E-05
R23	300	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	5.60E-04	5.60E-04	5.60E-04	7.46E-04	7.46E-04	7.46E-04	3.55E-04	2.24E-04	2.24E-04
R24	750	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	1.07E-03	1.07E-03	1.07E-03	1.34E-03	1.34E-03	1.34E-03	7.03E-04	4.41E-04	4.41E-04
R25	1500	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.74E-03	1.74E-03	1.74E-03	2.10E-03	2.10E-03	2.10E-03	1.18E-03	7.34E-04	7.34E-04
R26	3500	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	3.17E-03	3.17E-03	3.17E-03	3.61E-03	3.61E-03	3.61E-03	2.22E-03	1.37E-03	1.37E-03
R27	7500	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	5.44E-03	5.44E-03	5.44E-03	5.89E-03	5.89E-03	5.89E-03	3.93E-03	2.40E-03	2.40E-03
R28	Pegged	0.141	0.141	0.141	0.196	0.196	0.196	0.209	0.209	0.209	0.181	0.181	0.181	0.141	0.066	0.066
R29																
R30		1.51E-01	7.43E-03	5.96E-02	1.99E-03	0.00E+00	0.00E+00	7.22E-01	3.45E-02	2.42E-01	0.00E+00	0.00E+00	9.72E-03	0.00E+00	1.67E-03	9.49E-05
R31		2.69E-03	1.06E-05	6.88E-04	5.57E-03	0.00E+00	0.00E+00	1.16E-02	5.55E-04	3.88E-03	0.00E+00	0.00E+00	3.84E-03	0.00E+00	6.96E-05	4.49E-06
R32		2.44E-03	2.11E-05	7.73E-04	3.87E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.41E-06	0.00E+00
R33		6.43E-03	0.00E+00	1.52E-03	4.48E-04	0.00E+00	0.00E+00	3.21E-03	1.57E-04	1.08E-03	0.00E+00	0.00E+00	3.98E-04	0.00E+00	1.47E-05	0.00E+00
R34		8.80E-03	0.00E+00	2.58E-03	4.89E-04	0.00E+00	0.00E+00	1.46E-03	6.35E-05	4.76E-04	0.00E+00	0.00E+00	6.86E-04	0.00E+00	2.74E-05	0.00E+00
R35		7.15E-03	0.00E+00	2.79E-03	5.89E-04	0.00E+00	0.00E+00	2.50E-03	1.09E-04	8.15E-04	0.00E+00	0.00E+00	1.24E-03	0.00E+00	2.40E-05	0.00E+00
R36		4.66E-02	0.00E+00	8.47E-03	9.81E-03	0.00E+00	0.00E+00	1.93E-01	8.38E-03	6.49E-02	0.00E+00	0.00E+00	1.99E-02	0.00E+00	0.00E+00	0.00E+00
R37																
R38		2.25E-01	7.46E-03	7.64E-02	1.93E-02	0.00E+00	0.00E+00	9.33E-01	4.37E-02	3.13E-01	0.00E+00	0.00E+00	3.58E-02	0.00E+00	1.81E-03	9.94E-05
R39		5.41E+00	1.79E-01	1.83E+00	4.63E-01	0.00E+00	0.00E+00	2.24E+01	1.05E+00	7.52E+00	0.00E+00	0.00E+00	8.58E-01	0.00E+00	4.35E-02	2.38E-03
R40																
R41																3.98E+01
R42																14527

Row 1 (R1) shows the specific componet types.
Row 3 (R3) shows the number of proposed components for the emissions unit per component type. Number includes a 20% contingency.
Rows R5 through R11 shows the historical percentages of leaking components for the listed screening level ranges shown in column 1 (C1).
Rows R13 through R19 shows the number of components for each screening level range based on the historical percentages of leaking components.
Rows R22 through 28 show the CAPCOA correlaiton equation derived emissions factors (lb/hr/component). The screening values used in the equation are shown in C1.
Rows R30 through R36 show the emissions (lb/hr) per component type per screening level range.
Row R38 shows the total lb/hr emisions per component type for all screening value ranges.
Row R39 shows the total lb/day emisions per component type for all screening value ranges.
Row 41 shows the total lb/day emissions for the emissions unit.
Row 42 shows the total lb/yr emissions for the emissions unit.

Flare Gas Recovery System, Permit Unit S-33-413

	C1	C2	C3	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15
R1		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (V)
R2							0				0					
R3		35.1	0	260.55	0	0	0	32.4	0	275.4	2.7	2.4	0	0	109.35	606.15
R4																
R5	<100	0.9864	0.9992	0.9901	0.5561	0.5561	0.7188	0.9946	0.9946	0.9946	0.7063	0.8756	0.8756	0.9901	0.9867	0.9867
R6	<500	0.0046	0.0004	0.0030	0.4089	0.4089	0.2760	0.0045	0.0045	0.0045	0.2727	0.1096	0.1096	0.0030	0.0111	0.0111
R7	<1,000	0.0021	0.0004	0.0017	0.0142	0.0142	0.0052	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0017	0.0002	0.0002
R8	<2,000	0.0033	0.0000	0.0020	0.0099	0.0099	0.0000	0.0004	0.0004	0.0004	0.0000	0.0040	0.0040	0.0020	0.0008	0.0008
R9	<5,000	0.0024	0.0000	0.0018	0.0056	0.0056	0.0000	0.0001	0.0001	0.0001	0.0000	0.0040	0.0040	0.0018	0.0006	0.0006
R10	<10,000	0.0011	0.0000	0.0011	0.0039	0.0039	0.0000	0.0001	0.0001	0.0001	0.0070	0.0045	0.0045	0.0011	0.0005	0.0005
R11	Pegged	0.0002	0.0000	0.0001	0.0013	0.0013	0.0000	0.0002	0.0002	0.0002	0.0140	0.0023	0.0023	0.0001	0.0001	0.0001
R12																
R13		34.62	0.00	257.97	0.00	0.00	0.00	32.23	0.00	273.91	1.91	2.10	0.00	0.00	107.90	598.09
R14		0.16	0.00	0.78	0.00	0.00	0.00	0.15	0.00	1.24	0.74	0.26	0.00	0.00	1.21	6.73
R15		0.07	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.12
R16		0.12	0.00	0.52	0.00	0.00	0.00	0.01	0.00	0.11	0.00	0.01	0.00	0.00	0.09	0.48
R17		0.08	0.00	0.47	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.01	0.00	0.00	0.07	0.36
R18		0.04	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.03	0.02	0.01	0.00	0.00	0.05	0.30
R19		0.01	0.00	0.03	0.00	0.00	0.00	0.01	0.00	0.06	0.04	0.01	0.00	0.00	0.01	0.06
R20																
R21		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)
R22	50	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	1.58E-04	1.58E-04	1.58E-04	2.36E-04	2.36E-04	2.36E-04	9.30E-05	6.00E-05	6.00E-05
R23	300	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	5.60E-04	5.60E-04	5.60E-04	7.46E-04	7.46E-04	7.46E-04	3.55E-04	2.24E-04	2.24E-04
R24	750	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	1.07E-03	1.07E-03	1.07E-03	1.34E-03	1.34E-03	1.34E-03	7.03E-04	4.41E-04	4.41E-04
R25	1500	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.74E-03	1.74E-03	1.74E-03	2.10E-03	2.10E-03	2.10E-03	1.18E-03	7.34E-04	7.34E-04
R26	3500	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	3.17E-03	3.17E-03	3.17E-03	3.61E-03	3.61E-03	3.61E-03	2.22E-03	1.37E-03	1.37E-03
R27	7500	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	5.44E-03	5.44E-03	5.44E-03	5.89E-03	5.89E-03	5.89E-03	3.93E-03	2.40E-03	2.40E-03
R28	Pegged	0.141	0.141	0.141	0.196	0.196	0.196	0.209	0.209	0.209	0.181	0.181	0.181	0.141	0.066	0.066
R29																
R30		3.22E-03	0.00E+00	2.40E-02	0.00E+00	0.00E+00	0.00E+00	5.10E-03	0.00E+00	4.33E-02	4.51E-04	4.96E-04	0.00E+00	0.00E+00	6.48E-03	3.59E-02
R31		5.67E-05	0.00E+00	2.77E-04	0.00E+00	0.00E+00	0.00E+00	8.40E-05	0.00E+00	6.95E-04	5.52E-04	1.94E-04	0.00E+00	0.00E+00	2.72E-04	1.51E-03
R32		4.92E-05	0.00E+00	3.09E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.81E-06	5.29E-05
R33		1.42E-04	0.00E+00	6.14E-04	0.00E+00	0.00E+00	0.00E+00	1.74E-05	0.00E+00	1.92E-04	0.00E+00	2.10E-05	0.00E+00	0.00E+00	6.60E-05	3.52E-04
R34		1.78E-04	0.00E+00	1.04E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.52E-05	0.00E+00	3.61E-05	0.00E+00	0.00E+00	9.58E-05	4.93E-04
R35		1.57E-04	0.00E+00	1.14E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.63E-04	1.18E-04	5.89E-05	0.00E+00	0.00E+00	1.20E-04	7.20E-04
R36		1.41E-03	0.00E+00	4.23E-03	0.00E+00	0.00E+00	0.00E+00	2.09E-03	0.00E+00	1.26E-02	7.23E-03	1.81E-03	0.00E+00	0.00E+00	6.61E-04	3.97E-03
R37																
R38		5.21E-03	0.00E+00	3.16E-02	0.00E+00	0.00E+00	0.00E+00	7.29E-03	0.00E+00	5.70E-02	8.35E-03	2.61E-03	0.00E+00	0.00E+00	7.70E-03	4.30E-02
R39		1.25E-01	0.00E+00	7.59E-01	0.00E+00	0.00E+00	0.00E+00	1.75E-01	0.00E+00	1.37E+00	2.00E-01	6.27E-02	0.00E+00	0.00E+00	1.85E-01	1.03E+00
R40																
R41																3.90E+00
R42																1424

Row 1 (R1) shows the specific componet types.
Row 3 (R3) shows the number of proposed components for the emissions unit per component type. Number includes a 20% contingency.
Rows R5 through R11 shows the historical percentages of leaking components for the listed screening level ranges shown in column 1 (C1).
Rows R13 through R19 shows the number of components for each screening level range based on the historical percentages of leaking components.
Rows R22 through 28 show the CAPCOA correlaiton equation derived emissions factors (lb/hr/component). The screening values used in the equation are shown in C1.
Rows R30 through R36 show the emissions (lb/hr) per component type per screening level range.
Row R38 shows the total lb/hr emisions per component type for all screening value ranges.
Row R39 shows the total lb/day emisions per component type for all screening value ranges.
Row 41 shows the total lb/day emissions for the emissions unit.
Row 42 shows the total lb/yr emissions for the emissions unit.

Ground Flare, Permit Unit S-33-413

	C1	C2	C3	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15
R1		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)
R2							0				0					
R3		0	0	729	5.4	0	0	10.8	0	171.45	0	0	0	0	0	0
R4																
R5	<100	0.9864	0.9992	0.9901	0.5561	0.5561	0.7188	0.9946	0.9946	0.9946	0.7063	0.8756	0.8756	0.9901	0.9867	0.9867
R6	<500	0.0046	0.0004	0.0030	0.4089	0.4089	0.2760	0.0045	0.0045	0.0045	0.2727	0.1096	0.1096	0.0030	0.0111	0.0111
R7	<1,000	0.0021	0.0004	0.0017	0.0142	0.0142	0.0052	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0017	0.0002	0.0002
R8	<2,000	0.0033	0.0000	0.0020	0.0099	0.0099	0.0000	0.0004	0.0004	0.0004	0.0000	0.0040	0.0040	0.0020	0.0008	0.0008
R9	<5,000	0.0024	0.0000	0.0018	0.0056	0.0056	0.0000	0.0001	0.0001	0.0001	0.0000	0.0040	0.0040	0.0018	0.0006	0.0006
R10	<10,000	0.0011	0.0000	0.0011	0.0039	0.0039	0.0000	0.0001	0.0001	0.0001	0.0070	0.0045	0.0045	0.0011	0.0005	0.0005
R11	Pegged	0.0002	0.0000	0.0001	0.0013	0.0013	0.0000	0.0002	0.0002	0.0002	0.0140	0.0023	0.0023	0.0001	0.0001	0.0001
R12																
R13		0.00	0.00	721.78	3.00	0.00	0.00	10.74	0.00	170.52	0.00	0.00	0.00	0.00	0.00	0.00
R14		0.00	0.00	2.19	2.21	0.00	0.00	0.05	0.00	0.77	0.00	0.00	0.00	0.00	0.00	0.00
R15		0.00	0.00	1.24	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
R16		0.00	0.00	1.46	0.05	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00
R17		0.00	0.00	1.31	0.03	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
R18		0.00	0.00	0.80	0.02	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
R19		0.00	0.00	0.07	0.01	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
R20																
R21		V (LL)	V (HL)	V (G)	P (SS,LL)	P (DS,LL)	P (HL)	F (LL)	F (HL)	F (V)	COM	PRV atm	PRV flr	CVS	SC (LL)	SC (HL)
R22	50	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	9.30E-05	1.58E-04	1.58E-04	1.58E-04	2.36E-04	2.36E-04	2.36E-04	9.30E-05	6.00E-05	6.00E-05
R23	300	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	3.55E-04	5.60E-04	5.60E-04	5.60E-04	7.46E-04	7.46E-04	7.46E-04	3.55E-04	2.24E-04	2.24E-04
R24	750	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	7.03E-04	1.07E-03	1.07E-03	1.07E-03	1.34E-03	1.34E-03	1.34E-03	7.03E-04	4.41E-04	4.41E-04
R25	1500	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.18E-03	1.74E-03	1.74E-03	1.74E-03	2.10E-03	2.10E-03	2.10E-03	1.18E-03	7.34E-04	7.34E-04
R26	3500	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	2.22E-03	3.17E-03	3.17E-03	3.17E-03	3.61E-03	3.61E-03	3.61E-03	2.22E-03	1.37E-03	1.37E-03
R27	7500	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	3.93E-03	5.44E-03	5.44E-03	5.44E-03	5.89E-03	5.89E-03	5.89E-03	3.93E-03	2.40E-03	2.40E-03
R28	Pegged	0.141	0.141	0.141	0.196	0.196	0.196	0.209	0.209	0.209	0.181	0.181	0.181	0.141	0.066	0.066
R29																
R30		0.00E+00	0.00E+00	6.71E-02	2.79E-04	0.00E+00	0.00E+00	1.70E-03	0.00E+00	2.70E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
R31		0.00E+00	0.00E+00	7.77E-04	7.84E-04	0.00E+00	0.00E+00	2.80E-05	0.00E+00	4.31E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
R32		0.00E+00	0.00E+00	8.72E-04	5.62E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
R33		0.00E+00	0.00E+00	1.72E-03	5.90E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.22E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
R34		0.00E+00	0.00E+00	2.91E-03	6.67E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.35E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
R35		0.00E+00	0.00E+00	3.14E-03	7.85E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.09E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
R36		0.00E+00	0.00E+00	9.88E-03	1.96E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.28E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
R37																
R38		0.00E+00	0.00E+00	8.64E-02	3.29E-03	0.00E+00	0.00E+00	1.73E-03	0.00E+00	3.40E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
R39		0.00E+00	0.00E+00	2.07E+00	7.88E-02	0.00E+00	0.00E+00	4.14E-02	0.00E+00	8.15E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
R40																
R41																3.00E+00
R42																1095

Row 1 (R1) shows the specific componet types.
Row 3 (R3) shows the number of proposed components for the emissions unit per component type. Number includes a 20% contingency.
Rows R5 through R11 shows the historical percentages of leaking components for the listed screening level ranges shown in column 1 (C1).
Rows R13 through R19 shows the number of components for each screening level range based on the historical percentages of leaking components.
Rows R22 through 28 show the CAPCOA correlaiton equation derived emissions factors (lb/hr/component). The screening values used in the equation are shown in C1.
Rows R30 through R36 show the emissions (lb/hr) per component type per screening level range.
Row R38 shows the total lb/hr emisions per component type for all screening value ranges.
Row R39 shows the total lb/day emisions per component type for all screening value ranges.
Row 41 shows the total lb/day emissions for the emissions unit.
Row 42 shows the total lb/yr emissions for the emissions unit.

Point Source Emissions

Permit #	Desc	Category	Unit	NOx	SOx	PM10	CO	VOC	Ammonia
407-0	HGU2	Fuel	mm btu/day	15384	15384	15384	15384	15384	15384
		EF	lb/ mm btu	0.00607	0.00560	0.00745	0.00739	0.00540	0.00450
		Emissions	lb/day	93.4	86.2	114.6	113.7	83.1	69.2
		Emissions	lb/yr	34091	31463	41829	41501	30332	25258
		Emissions	lb/qtr	8523	7866	10457	10375	7583	6315

Permit #	Desc	Category	Unit	NOx	SOx	PM10	CO	VOC	Ammonia
408-0	HDS/35	Fuel	mm btu/day	840	840	840	840	840	840
		EF	lb/ mm btu	0.00607	0.00560	0.00745	0.03697	0.00540	0.00450
		Emissions	lb/day	5.1	4.7	6.3	31.1	4.5	3.8
		Emissions	lb/yr	1862	1716	2300	11352	1643	1387
		Emissions	lb/qtr	466	429	575	2838	411	347
408-0	HDS/47	Fuel	mm btu/day	1128	1128	1128	1128	1128	1128
		EF	lb/ mm btu	0.00607	0.00560	0.00745	0.03697	0.00540	0.00450
		Emissions	lb/day	6.8	6.3	8.4	41.7	6.1	5.1
		Emissions	lb/yr	2482	2300	3066	15221	2227	1862
		Emissions	lb/qtr	621	575	767	3805	557	466

Permit #	Desc	Category	Unit	NOx	SOx	PM10	CO	VOC
409-0	SWATTS	Vent Exhaust	MSCF/HR		363.8		363.8	
		EF	ppmv @ 0% O2		30		100	
		Emissions	lb/day		44.2		64.4	32.6
		Emissions	lb/yr		16133		23506	11899
		Emissions	lb/qtr		4033		5877	2975

Permit #	Desc	Category	Unit	NOx	SOx	PM10	CO	VOC	Ammonia
410-0	FCCU	Flue gas	lb.mol/hr	9146.8	9146.8	9146.8	9146.8	9146.8	9146.8
		EF	ppmv	20	20		50	19	10
		EF	lb/hr			5.5500			
		Emissions	lb/day	404.0	703.1	133.2	3074.5	66.7	39.5
		Emissions	lb/yr	73716	102561	48618	112176	24358	14418
		Emissions	lb/qtr	18429	25640	12155	28044	6090	3605

Permit #	Desc	Category	Unit	NOx	SOx	PM10	CO	VOC
410-0	Startup Heater	Fuel	mm btu/day	712	712	712	712	712
		EF	lb/ mm btu	0.12100	0.00560	0.00745	0.07390	0.00540
		Emissions	lb/day	86.2	4.0	5.3	52.6	3.8
		Emissions	lb/yr	431	20	27	263	19
		Emissions	lb/qtr	108	5	7	66	5

Permit #	Desc	Category	Unit	NOx	SOx	PM10	CO	VOC	Ammonia
411-0	LPG isostrippe	Fuel	mm btu/day	5160	5160	5160	5160	5160	5160
		EF	lb/ mm btu	0.00607	0.00560	0.00745	0.00739	0.00540	0.00450
		Emissions	lb/day	31.3	28.9	38.4	38.1	27.9	23.2
		Emissions	lb/yr	11425	10549	14016	13907	10184	8468
		Emissions	lb/qtr	2856	2637	3504	3477	2546	2117

Permit #	Desc	Category	Unit	NOx	SOx	PM10	CO	VOC
413-0	Flare	SU/SD Gas	mm btu/day and yr	2268.6	2268.6	2268.6	2268.6	2268.6
		Pilot	mm btu/day	72.0	72.0	72.0	72.0	72.0
		Pilot	mm btu/yr	26280.0	26280.0	26280.0	26280.0	26280.0
		EF Pilot	lb/ mm btu		0.00560			
		EF Gas	lb/ mm btu	0.06800	N/A	0.00800	0.37000	0.06300
		Emissions	lb/day	158.2	100.3	60.5	860.6	146.5
		Emissions	lb/yr	1941	396	228	10563	1799
		Emissions	lb/qtr	485	99	57	2641	450

Permit #	Desc	Category	Unit	NOx	SOx	PM10	CO	VOC
415-0	Cooling Tower	Recirc	gal/min			15000		15000
		EF	lb/ mm gal			0.08345		0.70000
		Emissions	lb/day			1.8		15.1
		Emissions	lb/yr	0	0	657	0	5512

Permit #	Desc	Category	Unit	NOx	SOx	PM10	CO	VOC
416-0	Cooling Tower	Recirc	gal/min			15000		15000
		EF	lb/ mm gal			0.08345		0.70000
		Emissions	lb/day			1.8		15.1
		Emissions	lb/yr	0	0	657	0	5512

Daily and Annual Emissions Summary

Permit #	Desc			NOx	SOx	PM10	CO	$VOC_{pt.source}$	VOC_{fug}
407-0	HGU2	lb/day		93.4	86.2	114.6	113.7	83.1	15.3
408-0	HDS/35	lb/day		5.1	4.7	6.3	31.1	4.5	65.6
408-0	HDS/47	lb/day		6.8	6.3	8.4	41.7	6.1	0.0
409-0	SWATTS	lb/day		0.0	44.2	0.0	64.4	32.6	0.0
410-0	FCCU	lb/day		404.0	703.1	133.2	3074.5	66.7	39.4
410-0	Startup Heater	lb/day		0.0	0.0	0.0	0.0	0.0	0.0
411-0	LPG isostrippe	lb/day		31.3	28.9	38.4	38.1	27.9	50.1
413-0	Flare	lb/day		158.2	100.3	60.5	860.6	146.5	6.9
414-0	Flare	lb/day	canceled	0.0	0.0	0.0	0.0	0.0	0.0
415-0	Cooling Tower	lb/day		0.0	0.0	1.8	0.0	15.1	0.0
416-0	Cooling Tower	lb/day		0.0	0.0	1.8	0.0	15.1	0.0
Total Emissions (lb/day)				698.8	973.7	365.0	4224.1	397.6	177.3

Permit #	Desc			NOx	SOx	PM10	CO	$VOC_{pt.source}$	VOC_{fug}	VOC_{tot}
407-0	HGU2	lb/yr		34091	31463	41829	41501	30332	5585	35917
408-0	HDS/35	lb/yr		1862	1716	2300	11352	1643	23944	25587
408-0	HDS/47	lb/yr		2482	2300	3066	15221	2227	0	2227
409-0	SWATTS	lb/yr		0	16133	0	23506	11899	0	11899
410-0	FCCU	lb/yr		73716	102561	48618	112176	24358	14381	38739
410-0	Startup Heater	lb/yr		431	20	27	263	19	0	19
411-0	LPG isostrippe	lb/yr		11425	10549	14016	13907	10184	18287	28471
413-0	Flare	lb/yr		1941	396	228	10563	1799	2519	4318
414-0	Flare	lb/yr	canceled	0	0	0	0	0	0	0
415-0	Cooling Tower	lb/yr		0	0	657	0	5512	0	5512
416-0	Cooling Tower	lb/yr		0	0	657	0	5512	0	5512
Total Emissions (lb/yr)				125948	165138	111398	228489	93485	64716	158201

Quarterly Net Emissions Change (QNEC)

QNEC

Permit #	Desc		NOx	SOx	PM10	CO	$VOC_{pt.source}$	VOC_{fug}	VOC_{tot}
407-0	HGU2	lb/qtr	8523	7866	10457	10375	7583	1396	8979
408-0	HDS/35	lb/qtr	466	429	575	2838	411	5986	6397
408-0	HDS/47	lb/qtr	621	575	767	3805	557	0	557
409-0	SWATTS	lb/qtr	0	4033	0	5877	2975	0	2975
410-0	FCCU	lb/qtr	18429	25640	12155	28044	6090	3595	9685
410-0	Startup Heater		108	5	7	66	5	0	5
411-0	LPG isostrippe	lb/qtr	2856	2637	3504	3477	2546	4572	7118
413-0	Flare	lb/qtr	485	99	57	2641	450	630	1080
414-0	Flare	lb/qtr	0	0	0	0	0	0	0
415-0	Cooling Tower	lb/qtr	0	0	164	0	1378	0	1378
416-0	Cooling Tower	lb/qtr	0	0	164	0	1378	0	1378
Totals			31488	41284	27850	57123	23373	16179	39552

Appendix D

Applicable District BACT Guidelines

San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.8.1*

Last Update: 9/1/2006

Refinery Heater, fired on refinery fuel gas and/or natural gas (< or = 50 MM Btu/hr)

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Good combustion practices		
NOx	25 ppmv @ 3% O2 (low NOx burners)	1) 5 ppmv @ 3% O2 (SCR) 2) 20 ppmv @ 3% O2 (ultra low NOx burners or equivalent)	
SOx	Treated refinery fuel gas and/or natural gas with no more than 100 ppmv total reduced sulfur (3-hr rolling average)		
CO	50 ppmvd @ 3% 02		
PM10	Treated refinery fuel gas and/or natural gas with no more than 100 ppmv total reduced sulfur		

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in s a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is requried for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

***This is a Summary Page for this Class of Source - Permit Specific BACT Determinations on Next Page(s)**

San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 1.8.2*

Last Update: 9/1/2006

Refinery Heater, fired on refinery fuel gas and/or natural gas (> 50 MM Btu/hr)

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Good combustion practices		
NOx	5 ppmv @ 3% O2, (15 minute average) (SCR and low NOx burners)		
SOx	Treated refinery fuel gas and/or natural gas with no more than 100 ppmv total reduced sulfur (3-hour rolling average)		
CO	10 ppmvd @ 3% O2		
PM10	Treated refinery fuel gas and/or natural gas with no more than 100 ppmv total reduced sulfur (3-hour rolling average)		

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in s a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is requried for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

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San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 7.2.1*

Last Update: 1/1/1995

Petroleum/Gas Processing - Induced Draft Evaporative Cooling Tower, 18,000 gpm

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
PM10		Cellular Type Drift Eliminator (75% control)	
VOC		Hydrocarbon detection device in tower with repair of leaks in heat exchangers within 15 days of detection (88% Control)	

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in s a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is requried for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

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San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 7.2.2*

Last Update: 11/27/2006

Petroleum Refining - Valves & Connectors

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Leak defined as a reading of methane in excess of 100 ppmv above background when measure per EPA Method 21 and an Inspection and Maintenance Program pursuant to District Rule 4455		

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in s a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is requried for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

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San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 7.2.3*

Last Update: 11/27/2006

Petroleum Refining - Pump and Compressor Seals

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Leak defined as a reading of methane in excess of 500 ppmv above background when measure per EPA Method 21 and an Inspection and Maintenance Program pursuant to District Rule 4455		

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in s a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is requried for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

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San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 7.2.8*

Last Update: 9/1/2006

Catalyst Regeneration - Fluid Catalytic Cracking Unit

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Good combustion practices		
NOx	20 ppmv @ 0% O2 (365 day rolling average) and 40 ppmv @ 0% O2 (7 day rolling average). During startup/shutdown events, operator must comply with a District approved set of workplace practices.		
CO	59 ppmv @ 0% O2 on a 365 day rolling avg and 78 ppmv @ 0% O2 on 30 day rolling average. During startup/shutdown events, operator must comply with a District approved set of workplace practices		
PM10		0.5 lb PM10 / 1000 lb of coke burned	
SOx	20 ppmv @ 0% O2 (365 day rolling average) and 50 ppmv @ 0% O2 (7 day rolling average)		

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in s a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is requried for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

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San Joaquin Valley
Unified Air Pollution Control District
Best Available Control Technology (BACT) Guideline 7.2.9

Emission Unit: **Sour Water Ammonia to Ammonium Thiosulfate Unit (SWAATS)**

Industry Type: **Petroleum Refining**

Last Update:

Equipment Rating: All

Pollutant	Achieved in Practice or contained in SIP	Technologically Feasible	Alternate Basic Equipment
VOC		1. incineration of sour water stripper off-gas (SWSG) contactors exhaust and incineration of SO_2 scrubber exhaust 2. incineration of SWSG contactors exhaust	
SOx	oxidation of sulfur compounds to SO_2 by combustion and catalytic reactor followed by SO_2 scrubbing achieving 95% removal or 30 ppmvd @ 0% O_2		
CO		1. efficient combustion of SWSG contactors exhaust and incineration of SO_2 scrubber exhaust 2. efficient combustion of SWSG contactors exhaust	

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

***This is a Summary Page for this Class of Source - Permit Specific BACT Determinations on Next Page(s)**

Appendix E

Top Down BACT Analyses

BACT ANALYSIS
Valves and Connectors

I. PROPOSAL

As part it's refinery upgrade project, Big West of California proposes the installation of process equipment to convert approximately 30,000 barrel per day of heavy gas oil to gasoline, diesel and LPG. Valves, flanges and other connectors are required for this installation. These fugitive components have the potential to leak and, therefore, to emit VOC to the atmosphere.
VOC is the only pollutant emitted from these components.

II. EMISSION CONTROL TECHNOLOGY EVALUATION:

A. BACT Applicability

Collectively, these components have potential to emit or more than 2 lb/day, and, thus require BACT.

B. BACT Policy

For classes and categories covered in the District's BACT Clearinghouse, the list of available control technologies shall be limited to those listed in the Clearinghouse as of the date the application is deemed complete.

BACT Guideline 7.2.2 is listed, *Petroleum Refining – Valves and Connectors,* is listed in the District BACT Clearinghouse and is applicable to the valves and connectors proposed in this project.

C. TOP DOWN BACT Analysis – Valves and Connectors

<u>BACT for VOC</u>

Step 1 - Identify All Possible Control Technologies

1. Leak defined as a reading of methane in excess of 100 ppmv above background when measured per EPA Method 21, and an inspection and maintenance program pursuant to District Rule 4455.

Step 2 - Eliminate Technologically Infeasible Options

The listed option is feasible and is achieved in practice.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. Leak defined as a reading of methane in excess of 100 ppmv above background when measured per EPA Method 21, and an inspection and maintenance program pursuant to District Rule 4455.

Step 4 - Cost Effectiveness Analysis

As the applicant is proposing the highest ranked control option not eliminated in Step 2, a cost effectiveness analysis is not required.

Step 5 - Select BACT

1. Leak defined as a reading of methane in excess of 100 ppmv above background when measured per EPA Method 21, and an inspection and maintenance program pursuant to District Rule 4455

BACT ANALYSIS
Pump and Compressor Seals

I. PROPOSAL

As part it's refinery upgrade project, Big West of California proposes the installation of process equipment to convert approximately 30,000 barrel per day of heavy gas oil to gasoline, diesel and LPG. Liquid pumps and vapor compressors are required for this installation. Pumps and compressors experience leaks from their seals, and thus will emit VOC to the atmosphere. VOC is the only pollutant emitted from these components.

II. EMISSION CONTROL TECHNOLOGY EVALUATION:

A. BACT Applicability

Collectively, leaks from pump and compressor seals have the potential to exceed 2 lb/day, thus the pumps and compressors proposed for this project must satisfy BACT.

B. BACT Policy

For classes and categories covered in the District's BACT Clearinghouse, the list of available control technologies shall be limited to those listed in the Clearinghouse as of the date the application is deemed complete.

BACT Guideline 7.2.3 is listed, *Petroleum Refining – Pump and Compressor Seals,* is listed in the District BACT Clearinghouse and is applicable to the pump and compressor seal proposed in this project.

C. TOP DOWN BACT Analysis – Pump and Compressor Seals

<u>BACT for VOC</u>

Step 1 - Identify All Possible Control Technologies

1. Leak defined as a reading of methane in excess of 500 ppmv above background when measured per EPA Method 21, and an inspection and maintenance program pursuant to District Rule 4455.

Step 2 - Eliminate Technologically Infeasible Options

The listed option is feasible and is achieved in practice.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. Leak defined as a reading of methane in excess of 500 ppmv above background when measured per EPA Method 21, and an inspection and maintenance program pursuant to District Rule 4455.

Step 4 - Cost Effectiveness Analysis

As the applicant is proposing the highest ranked control option not eliminated in Step 2, a cost effectiveness analysis is not required.

Step 5 - Select BACT

1. Leak defined as a reading of methane in excess of 500 ppmv above background when measured per EPA Method 21, and an inspection and maintenance program pursuant to District Rule 4455

BACT ANALYSIS
Petroleum/Gas Processing
Induced Draft Evaporative Cooling Tower

I. PROPOSAL

As part it's refinery upgrade project, Big West of California proposes the installation of process equipment to convert approximately 30,000 barrel per day of heavy gas oil to gasoline, diesel and LPG. Two forced-draft evaporative cooling towers are proposed for this project. One cooling tower will provide cooling water to the shell and tube heat exchangers in the VGO-HDS unit, the FCC unit, the Merox unit, the HGU2, and various other new utility and process units. A second cooling tower will provide cooling water for the new Alky Unit. The circulation rate for each cooling tower will be 15,000 gallons per minute (gpm).

II. EMISSION CONTROL TECHNOLOGY EVALUATION:

A. BACT Applicability

Cooling towers are the source of PM10 emissions. PM10 emissions are due to the total dissolved solids (TDS), mostly salts, in the cooling water. In the cooling process, some of the cooling water (and TDS) is carried out. This is referred to as drift. Some portion of the drift dries in the air before settling to ground, with some portion of the dissolved solids becoming airborne PM. Applicant has conservatively assumed that all drift will remain suspended in the air and will dry to PM10. This approach overstates PM10 emissions.

Cooling towers operating at refineries may also be the source of VOC. Through leaks in piping and heat exchangers, hydrocarbon can end up in the circulating cooling water and be emitted as VOC.

The potential to emit PM_{10} and VOC from each cooling tower exceeds 2.0 lb/day, thus requiring a BACT review for these pollutants.

B. BACT Policy

For classes and categories covered in the District's BACT Clearinghouse, the list of available control technologies shall be limited to those listed in the Clearinghouse as of the date the application is deemed complete.

BACT Guideline 7.2.1 is listed, *Petroleum/Gas Processing – Induced Draft Evaporative Cooling,* is listed in the District BACT Clearinghouse and is applicable two cooling towers proposed in this project.

C. TOP DOWN BACT Analysis – Induced/Forced Draft Evaporative Cooling Towers

The applicant is proposing a high efficiency drift eliminator for the control the amount of drift and ultimately PM_{10} that are emitted and hydrocarbon leak detection monitor in the tower and leak repair within 15 days. As shown in the top-down BACT analysis below, BACT for PM_{10} and VOC have been satisfied.

BACT for PM_{10}

Step 1 - Identify All Possible Control Technologies

1. Cellular Type Drift Eliminator (75% control)

Step 2 - Eliminate Technologically Infeasible Options

The listed option is feasible and is achieved in practice.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. Cellular Type Drift Eliminator (75% control)

Step 4 - Cost Effectiveness Analysis

As the applicant is proposing the highest ranked control option not eliminated in Step 2, a cost effectiveness analysis is not required.

Step 5 - Select BACT

1. Cellular Type Drift Eliminator (75% control)

BACT for VOC

Step 1 - Identify All Possible Control Technologies

1. Hydrocarbon detection device in tower with repair of leaks in heat exchanger within 15 days of detection (88% control)

Step 2 - Eliminate Technologically Infeasible Options

The listed option is feasible and is achieved in practice.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. Hydrocarbon detection device in tower with repair of leaks in heat exchanger within 15 days of detection (88% control)

Step 4 - Cost Effectiveness Analysis

As the applicant is proposing the highest ranked control option not eliminated in Step 2, a cost effectiveness analysis is not required.

Step 5 - Select BACT

1. Hydrocarbon detection device in tower with repair of leaks in heat exchanger within 15 days of detection (88% control)

BACT ANALYSIS
Refinery Heater ≤ 50 MM Btu/hr

I. Proposal

As part it's refinery motor fuels production upgrade project, Big West of California is proposing the installation of two natural draft, process heaters having heat input capacities of 50 MM Btu/hr or less, and fired on treated refinery fuel. These units are associated with the VGO-HDS unit (S-33-408-0). District BACT Guideline 1.8.1 applies to these units, but is incomplete in that it does not address BACT for CO, and does not incorporate a review of the latest NO_x and SO_x emission control technologies and limits. Therefore, the District will update the existing BACT guideline for natural draft, refinery process heaters with maximum heat input ratings equal to or less than 50 MM Btu/hr.

The VGO-HDS unit requires two natural draft process heaters: a 47 MM Btu/hr feed heater that will heat the gas oil/hydrogen feed stream prior to introduction into the reactor vessel, and a 35 MM Btu/hr fractionator feed heater. The heaters will be fired on treated refinery gas and will be equipped with ultra low NOx burners and selective catalytic reduction NO_x control (SCR). The heaters are full time units that will operate whenever the VGO-HDS unit is operated.

II. EMISSION CONTROL TECHNOLOGY EVALUATION:

A. BACT Applicability

District Rule 2201 Section 4.1 requires that BACT be applied to any unit with an IPE of any pollutant greater than 2 lb/day. Since the IPE is greater than 2.0 lb/day for each affected pollutant for each unit, and as the source is not exempt for CO emissions, BACT is required for NOx, SOx, CO, PM10 and VOC for each of the proposed refinery process heaters.

B. BACT Policy

District BACT guideline 1.8.1, Process Heater – Refinery, <= 50 MM Btu/hr, is applicable to the refinery process heaters being evaluated in this project. However, guideline 1.8.1 is not complete, as it does not address emission controls for carbon monoxide (CO) emissions. Further, the guideline will be revised to remove NOx emission levels that are not technologically feasible, 1.7 ppmv @ 3% O2 achieved with SCR and low NOx burners and 11.5 ppmv @ 3% O2 using ultra low NOx burners, and include the use of SCR as achieved in practice at a NO_x emissions limit of 5 ppmv @ 3% O_2. There are several process heaters with heat input capacities less than 50 MM Btu/hr operating in the Bay Area Air Quality Management District (BAAQMD) and South Coast Air Quality Management District (SCAQMD) that are equipped with SCR, and at least one having an emissions limit of

5 ppmv at 3% O_2 required as BACT. That unit, 90-B-401 - a 41.3 MM Btu/hr hydrotreating process heater, is operated at the ConocoPhillips refinery in the SCAQMD and has source tested NO_x emissions of less than 5 ppmv. The applicant has agreed to install SCR and meet a 5 ppmv NO_x limit @ 3% O_2.

In addition small process heaters equipped with SCR operating in the SCAQMD and BAAQMD, the District reviewed the U.S. Environmental Protection Agency (EPA) RACT/BACT/LAER Clearinghouse (RBLC), Bay Area Air Quality Management District (BAAQMD) BACT Guidelines, South Coast Air Quality Management District (SCAQMD) BACT Guidelines. It is noted that the applicant's has proposal the use of SCR and a 5 ppmv NO_x @ 3% O_2 for the large process heaters (> 50 MM Btu/hr), hydrogen reformer furnace (S-33-407) and iso-stripper reboiler (S-33-411), that are part of the Clean Fuels Project.

The most stringent NOx emissions limit identified was 5 ppmv @ 3% O_2 using SCR. Emissions limit and control technologies for VOC, CO, PM_{10} and SO_x were identified from District Guideline 1.81, Process Heater – Refinery, <= 50 MM Btu/hr, District Guideline 1.8.2, Process Heater – Refinery, > 50 MM Btu/hr, BAAQMD Guideline 94.1.1, Refinery Heater, Natural Draft, ≤50 MM Btu/hr, EPA RBLC ID AZ-0046, 25 MM Btu/hr Distillate Charge Heater, and the applicant's proposal.

C. BACT Analysis for Permit Unit S-33-408-0, VGO-HDS

The proposed refinery heaters will be used to transfer heat to feedstock. The heaters are less than 50 MM Btu/hr in heat input capacity, are equipped with low NOx burners and SCR and will have a natural draft design and burn treated refinery gas with no more than 40 ppmv total reduced sulfur.

<u>BACT for VOC</u>

Step 1 - Identify All Possible Control Technologies

1. Good combustion practices

   This option is listed in the Bay Area AAQMD Guideline 94.1.1 and in District Guideline 1.8.1. This option is achieved in practice.

   No other control options or alternate basic equipment were identified.

Step 2 - Eliminate Technologically Infeasible Options

The control option is feasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. Good combustion practices

Step 4 - Cost Effectiveness Analysis

A cost-effective analysis is not required as the applicant is proposing the option with the highest control efficiency.

Step 5 - Select BACT

1. Good combustion practices – No emissions limit specified

<u>BACT for NOx</u>

Step 1 - Identify All Possible Control Technologies

1. 5 ppmv @ 3% O2

   An emissions limit of 5 ppmv @ 3% O_2 has been identified by the District as achieved in practice BACT, achievable using SCR and advanced monitoring and operational controls.

   No limits lower than the limit listed above were identified. As this limit has been achieved in practice for the class and category of source, it is required for the two process heaters that will operate as part of the VGO-HDS unit. The applicant has agreed to this limit.

   Lower ranked control technologies and emissions limits are not listed.

<u>BACT for CO</u>

Step 1 - Identify All Possible Control Technologies

1. 50 ppmv @ 3% O2

   This option is listed as achieved in practice in the Bay Area AQMD BACT Guidelines – Document # 94.1.1, Heater/Refinery Process, Natural or Induced Draft, ≤50 MM BTU/hr. This emissions level is proposed by the applicant and is deemed achievable using good combustion practice.

2. Use of natural gas or treated refinery gas as fuel (no limit specified).

This option is listed as achieved in practice for VOC in District BACT Guideline 1.8.1, Process Heater, Refinery, < = 50 MM BTU/hr. As CO emissions rates generally respond in the same manner to combustion practices, such as O2 levels, the use of natural gas and/or treated refinery gas with good combustion practices can be considered achieved in practice BACT for CO.

Lower emissions levels or more effective control options for CO have not been identified in any other BACT guideline document, permit or reference material reviewed for this analysis.

Step 2 - Eliminate Technologically Infeasible Options

Both of the listed options are feasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. 50 ppmv @ 3% O2

2. Use natural gas or treated refinery gas as fuel (no limit specified).

Step 4 - Cost Effectiveness Analysis

The applicant is proposing a CO emissions limit of 50 ppmv @ 3% O2. As there is no more effective control listed, a cost effectiveness analysis is not required for CO.

Step 5 - Select BACT

50 ppmv NOx @ 3% O2 (low NOx burner or equivalent technology)

<u>BACT for PM10 and SOX</u>

Step 1 - Identify All Possible Control Technologies

For combustion sources (boilers, turbines, process heaters, etc.) fired on gaseous or light distillate liquid fuels, SOx is generally controlled by the selection of the fuel type and the maximum allowable fuel sulfur content. Total reduced sulfur compounds, including H2S, are completely oxidize in the combustion process to form SO_x. Post combustion controls have generally not been found to be as effective, practical or cost effective as pretreatment of the fuel.

There are no generally accepted emission factors available to estimate PM0 emissions from units fired on refinery fuel gas. Therefore, it is not possible to quantify a PM10 emission reduction due to using treated fuel gas. However, as SO_2 is a considered a precursor to PM10, emission controls that reduce the sulfur in the fuel will reduce the emissions of both SO_2 and PM.

1. Treated refinery fuel (0.75 grain H2S/100 scf)

   This option is listed as technologically feasible for SOx in District BACT Guideline 1.8.2, Process Heater, Refinery, >50 MM BTU/hr. This option can be achieved using a non-industry standard fuel gas sulfur treating system, such as SulfaTreat. Sulfa Treat type systems are not employed in any meaningful way in refineries to recovery sulfur. In fact, the sulfur is not recovered, but is chemically fixed with the treating chemical and must be disposed. The chemical and disposal costs associated with Sulfa Treat type systems are very high when compared to amine treating systems.

2. Treated refinery fuel (35 ppmv S as H_2S)

   This option is listed as technologically feasible BACT in the EPA's RBCL database (AZ-0046), for process heaters permitted at the Arizona Clean Fuels Yuma facility. This limit was proposed by the applicant and accepted as technologically feasible BACT by the Arizona Department of Environmental Quality (ADEQ). The applicant did not offer and ADEQ did not require a specific technical basis for the proposed limit. ADEQ did state that this limit is not being enforced for any refinery in the country and implied that the limit is technology forcing. The Arizona Clean Fuels project is a green field site construction, and, if built, would be the first refinery in Arizona and the first totally new refinery in the United States in over 20 years.

3. Treated refinery fuel (40 ppmv total reduced sulfur – 4 hour rolling average basis)

   The applicant has proposed this option.

   This limit is considered as technologically feasible and will be achieved for the refinery fuel used in the fired process heaters installed as part of the Clean Fuels Project by treatment to remove sulfur compounds and by selective blending of refinery gas from different areas of the refinery. Off-gasses produced in the VGO-HDS and FCC units will be treated in a new amine treatment unit. Additionally, a caustic scrubber will be added downstream of the Area 3 Delayed Coking Unit (DCU) amine treater to extract non-H2S compounds from the Area 3 refinery fuel gas. The caustic scrubber will assure compliance with the 40 ppmv total reduced sulfur limit when Area 3 gas is blended into Area 2 fuel gas system, which is expected to occur on a routine basis.

4. Treated refinery fuel (50 ppmv H_2S and 100 ppmv total reduced sulfur)

   This limit is listed as technologically feasible in the Bay Area AQMD BACT Guidelines – Document # 94.1.1, Heater/Refinery Process, ≤50 MM BTU/hr. In addition, a 100 ppmv total sulfur (as H2S) limit applies to heaters 14-H1 and 14-H2 at the Refinery (permit unit S-33-13) on a 3-hour rolling average basis.

5. Treated refinery fuel (100 ppmv total reduced sulfur)

   This limit is listed as achieved in practice in the Bay Area AQMD BACT Guidelines – Document # 94.1.1, Heater/Refinery Process, ≤50 MM BTU/hr.

Step 2 - Eliminate Technologically Infeasible Options

2. Treated refinery fuel (35 ppmv S as H_2S)

   As stated above, this limit was required for the Arizona Clean Fuels Yuma facility, which received a PSD permit in 2005. In their evaluation, the Arizona Department of Environmental Quality (ADEQ) identified this limit as more stringent than any limit currently imposed for any refinery operating in the United States. The ADEQ considered this limit to be technology forcing, but achievable for a new refinery using an industry standard amine treating system with MDEA solution.

   The ADEQ technical support document issued February 2005 states that the permittee initially proposed a 140 ppmv sulfur limit, but based on a further review of emission levels achieved by other RFG-fired combustion sources, the Department determined that an RFG sulfur content limit of 35 ppmv is representative of the achievable level with amine contactors. No specific citations or references were given to support this fuel sulfur content limit. The agency was contacted through the permitting engineer for this project, who confirmed that there was no specific information available (test results, correspondence, manufacturers information, etc) to support the 35 ppmv. The limit was determined to be achievable for the ACF facility based primarily on the engineer's refinery industry experience and on the permittee's acceptance of the limit.

   Like Arizona Clean Fuels, Big West of California is proposing to install a fuel gas amine treating system using MDEA solution. The system will serve the new vacuum gas oil hydrodesulfurizer (S-33-408) and two existing units, the HCU and HTU-3. The design and build contractor for the amine treatment system, Linde BOC Process Plants LLC, has modeled the performance of the system with respect to the given set of design parameters. Linde states the removal efficiency of the proposed amine treating system using MDEA will be limited by the lowest of the pressures from the incoming streams, i.e., from the HCU unit. Based on this limiting pressure, the maximum theoretical amine loading (mol H_sS/mol amine), maximum H_2S reduction and final fuel gas H_2S limit were determined. Based on the modeling results, Linde will guarantee a fuel gas H_2S limit of 60 ppmv.

A copy of the Linde's correspondence regarding amine system performance to IAG, the overall design contractor, is included in Attachment BACT HTR<50 - A.

Given that an industry standard amine treating system is proposed and that the system has been optimized to the extent possible for maximum H2S removal given the design parameters inherent at the existing Big West facility, it is reasonable to conclude that achieving a fuel gas H_2S limit of 35 ppmv is not technologically feasible for the Big West Clean Fuels project. Further, the 35 ppmv sulfur limit (as H_2S) required for the Arizona Clean Fuels facility must, at this time, only be considered theoretically feasible. The limit was not supported by any technical demonstration or emissions test results from any existing facility or by a manufacturer's design proposal.

4. Treated refinery fuel (50 ppmv H2S and 100 ppmv total reduced sulfur)

   Option 4, which limits the H2S content to 50 ppmv and the total reduced sulfur content to 100 ppmv, is no more stringent in terms of post combustion SOx emissions than option 5, which solely contains a limit on the total reduced sulfur content of 100 ppmv. As such, option 4 is equivalent to option 5. Therefore, option 4 will not be considered further.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. Treated refinery fuel (0.75 grain H_2S/100 scf or 12 ppmv H_2S)

2. Treated refinery fuel (40 ppmv total reduced sulfur)

3. Treated refinery fuel (100 ppmv total reduced sulfur)

Step 4 - Cost Effectiveness Analysis

Included as Attachment BACT HTR<50 - B is a cost effectiveness analysis that demonstrates that reducing the sulfur content of the refinery gas to 0.75 grain (as H2S)/100 scf (12 ppmv as H2S) using a SufaTreat system is not a cost effective control option. This cost effectiveness analysis evaluates the cost to install and operate a SulfaTreat fuel gas sulfur removal system having a capacity to reduce the sulfur content of 1141 MM Btu/hr of refinery gas (the total heat input capacity of all refinery fuel fired units proposed for the Big West Clean Fuels project) from 160 to 12 ppmv as H2S, with a corresponding reduction in stack SO_2 emissions. The calculated cost per ton of SO_2 reduced was $4,982, which exceeds the cost effectiveness threshold value of $3900/ton reduced. Therefore, control option 1 above is not cost effective and has been eliminated.

Step 5 - Select BACT

1. Treated refinery fuel with no more than 40 ppmv total reduced sulfur. (4-hour rolling average)

   As the applicant has proposed the highest ranked control option that is technologically feasible and cost effective, BACT for PM_{10} and SOx have been satisfied.

Attachment BACT HTR<50 - B

Correspondence from Linde BOC Process Plants LLC to IAG Regarding Design Performance of Amine Treating System

Linde BOC Process Plants LLC

A Member of the Linde Engineering Division

Linde

July 12, 2006

IAG
3657 Briarpark
Houston, TX 77042-5205

Attention: Mr. Colin Mackay
Director of Projects

Subject: Fuel Gas Treater
Treated Fuel Gas Treater, H_2S Content
LBPP Project No. AA49

Gentlemen:

The Amine Unit is designed to treat the following three streams VGO HDS Unit Cold flash drum combined with existing HCO-DC flash drum off-gas and existing HTU-3 Stripper Flash Drum. These streams are combined and fed to the Fuel Gas Treater Unit. The combined stream pressure is dictated by HCU-DC stream which is available at the battery limit at 320 psig. The combined stream has an H_2S content of 3.015 mol%.

The calculations were performed with HYSYS utilizing DBR amine (process simulation software) physical property package. DBR property package is considered to be the industry standard best Amine Property package available. The calculated H_2S content is at equilibrium conditions. The partial pressure is such that further loading of amine is not possible without increasing pressure or changing temperatures of the lean amine. The rich amine loading is 0.3455 mol H_2S/mole amine.

Description of Process

The combined stream from the battery limit is cooled to 113°F with water in the feed gas cooler. The reason the feed gas is not cooled any further down is to avoid any condensation which will generate another sour stream. The gas from the cooler enters into a scrubber to K.O. any slug of liquid which might on some occasion enter into the bottom of the Amine Contactor and cause foaming.

The Amine Contactor is simulated with 17 theoretical trays and will have 25 actual trays.

The lean amine from the existing regenerator is fed at the top of the column at the rate of 50 gallons per minute. The Lean Amine has an H_2S loading of 0.01 moles of H_2S/mole of MDEA. The lean amine temperature is 120°F. The Contactor is designed to run at 232 psig.

Linde

The amine comes in contact with the acid gas. The amine picks up H_2S from the feed gas. The rich amine is routed back to the existing Amine Regeneration Unit and treated gas is sent to the refinery fuel system after passing through the scrubber.

Results and Conclusions

The calculated H_2S content of the treated gas is less than 50 volume ppm of H_2S. The treated gas will be delivered at 220 psig. The calculated concentration is a theoretical value that cannot be achieved on a continuous basis.

Increasing the Amine circulation will not help due to the low partial pressure of H_2S. Increasing circulation rate will not reduce the H_2S content of the treated gas further.

Due to amine degradation and our experience with operational parameter fluctuations we will guarantee that if the gas composition specified in the design package of June 28, 2006, Rev. 1, is treated in subject treater the H_2S content of treated gas will not exceed 60 ppmv.

Very truly yours,

LINDE BOC PROCESS PLANTS LLC

J. Scott Lewis

J. Scott Lewis, Business Unit Manager
Refining & Gas Processing

ZIM/JSL/sk

Attachment BACT HTR<50- B

SOx Cost Effectiveness Analysis

Cost Effectiveness of Fuel Gas Treatment for Sulfur Removal

160 ppmv H_2S to 12 ppmv H_2S

CFP Combustion Emissions

Total Heat Capacity, CFP Combustion Units	1141.3	MMBtu/hr
SO_2 EF @ 160 ppmv H2S	0.023	lb/MMBtu
SO_2 EF @ 12 ppmv H2S	0.002	lb/MMBtu
SO_2 Reduction	104.09	tpy

Calculations:

SO_2 EF = ppmv / (1200 MMBtu/MMscf) / (379.4 scf/lb-mol) x (64.0588 lb/lb-mol)

SO_2 Reduction = (SO_2 $EF_{Uncontrolled}$ - SO_2 $EF_{Controlled}$) x (Total Heat Capacity) x (8760 hr/yr) / (2000 lb/ton)

Capital Costs:	
Purchased Equipment:	
Vessels	$100,000
Monitoring equipment	$200,000
Purchased Equipment Cost (PEC)	$300,000
Direct Installation:	
Foundations	$5,000
Piping/Instrument/Electrical	$15,000
Direct Installation Cost (DIC)	$20,000
Indirect Costs:	
Engineering (10% of PEC)	$30,000
Contigency (3% of PEC)	$9,000
Indirect Capital Cost (ICC)	$39,000
Total Capital Cost (TCC) TCC = PEC + DIC + ICC	$359,000

Note: Purchased equipment and treating chemical costs provided by the MI-SWACO
Note: ICC estimation method follows guidance in EPA Air Pollution Control Cost Manual, 6th Ed.

Ongoing SulfaTreat XLP Media Costs:	
SulfaTreat XLP media, per lb ST-XLP	$0.79
Media shipment, per lb ST-XLP	$0.10
Change-out, per lb ST-XLP	$0.05
Disposal, per lb ST-XLP	$0.05
Total cost per lb ST-XLP	$0.99
Pounds ST-XLP per lb SO_2 reduction	2.14
Cost per ton of SO_2 reduction	$4,228.79

Annual Costs:	
ST-XLP (cost per ton x tpy reduction)	$440,183
Annual O&M	$20,000
Capital Recovery Cost	$58,426
Total Annual Costs	$518,609
Cost per ton SO_2 Reduction	$4,982
BACT Cost Effectiveness Limit	$3,900

Calculations:

Capital Recovery Cost = (Total Capital Costs) x $(i(1+i)^n)/((1+i)^n-1)$

Per District Policy APR 1305:

interest rate (i)	10%
Equipment life in years (n)	10

BACT ANALYSIS
Refinery Heater, > 50 MM Btu/hr

I. Proposal

As part of it's Clean Fuels upgrade project, Big West of California is proposing the installation two process heaters having heat input capacities greater than 50 MM Btu/hr. These units are the 641 MM Btu/hr hydrogen generation unit (S-33-407-0) and the 215 MM Btu/hr iso-stripper boiler serving the Alkylation unit (S-33-410-0). District BACT Guideline 1.8.2 applies to the above-listed equipment. Guideline 1.8.2 is incomplete in that it does not address BACT for CO, VOC and PM_{10}, and does not incorporate a review of the latest NO_x and SO_x emissions control technologies. Therefore, the District will update the existing BACT guideline for refinery process heaters with total burner rated heat inputs of greater than 50 MM Btu/hr.

II. EMISSION CONTROL TECHNOLOGY EVALUATION:

A. BACT Applicability

District Rule 2201 Section 4.1 requires that BACT be applied to any unit with an IPE of any pollutant greater than 2 lb/day. Since the IPE is greater than 2.0 lb/day for each affected pollutant for each unit, and as the source is not exempt for CO emissions, BACT is required for NOx, SOx, CO, PM10 and VOC for each of the proposed refinery process heaters.

B. BACT Policy

District BACT guideline 1.8.2, Process Heater – Refinery, > 50 MM Btu/hr, is applicable to the hydrogen generation unit and the Alkylation unit iso-stripper boiler being evaluated in this project. As previously stated, guideline 1.8.2 is not complete, as it does not address controls for carbon monoxide (CO) emissions, volatile compounds (VOC) and particulate matter (PM_{10}). Further, the guideline will be revised to remove a NOx emission level that is not technologically feasible, 1.7 ppmv @ 3% O2 achieved with SCR and low NOx burners, and add the applicant's proposed NOx emissions level, 5 ppmv, achievable with SCR.

A new BACT analysis is required to make the necessary revisions to guideline 1.8.2. The U.S. Environmental Protection Agency (EPA) RACT/BACT/LAER Clearinghouse (RBLC), the California Air Pollution Control Officers Association (CAPCOA) BACT Clearinghouse, the Bay Area Air Quality Management District (BAAQMD) BACT Guidelines, South Coast Air Quality Management District (SCAQMD) BACT Guidelines, District BACT Guidelines, and the applicant's own proposal for a NOx emissions level of 5 ppmv using SCR and low NOx burners were reviewed in revising Guideline 1.8.2.

The most stringent emissions limits identified were those from the District Guideline 1.81, Process Heater – Refinery, <= 50 MM Btu/hr, District Guideline 1.8.2, Process Heater – Refinery, > 50 MM Btu/hr, SCAQMD Guideline application #411357, 780 MM Btu/hr Steam Methane Reformer Furnace, BAAQMD Guideline 94.3.1, Refinery Heater > 50 MM Btu/hr, EPA RBCL ID AZ-0046, 25 MM Btu/hr Distillate Charge Heater, and the applicant's proposal.

C. Top Down BACT Analysis for Permit Unit S-33-407-0 (HGU2) and '411-0 (LPG Merox – Alkylation Unit)

HYDROGEN GENERATION UNIT (HGU2) WITH 641 MM BTU/HR STEAM METHANE REFORMER (SMR) FURNACE WITH FIFTY (50) 10.3 MM BTU/HR BURNERS (OR EQUIVALENT) AND SELECTIVE CATALYTIC REDUCTION EMISSIONS CONTROL SYSTEM

LIQUID PETROLEUM GAS (LPG) MEROX UNIT AND ALKYLATION UNIT WITH 215 MM BTU/HR ISO-STRIPPER REBOILER WITH CALLIDUS BURNER (OR EQUIVALENT) AND SELECTIVE CATALYTIC REDUCTION EMISSIONS CONTROL SYSTEM

<u>BACT for VOC</u>

Step 1 - Identify All Possible Control Technologies

1. Good Combustion Practices – No emissions limit specified.

This option is listed in the Bay Area AAQMD Guideline 94.3.1 as achieved in practice.

No other control options or alternate basic equipment were identified.

Step 2 - Eliminate Technologically Infeasible Options

The control option is feasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

2. Good Combustion Practices

Step 4 - Cost Effectiveness Analysis

A cost-effective analysis is not required as the applicant is proposing the option with the highest control efficiency.

Step 5 - Select BACT

2. Good Combustion Practices – No emissions limit specified.

<u>BACT for NOx</u>

Step 1 - Identify All Possible Control Technologies

1. 1.7 ppmv @ 3% O2 (SCR and low NOx burners)

Step 5 - Select BACT

1. 5 ppmv @ 3% O2 (15 minute average) (low NOx burners and SCR)

BACT for CO

Step 1 - Identify All Possible Control Technologies

1. 10 ppmv @ 3% O2 (SCR and Burner Tuning)

   The emissions limit listed above is referenced from the SCAQMD BACT guidelines, Application #411357 for Chevron Products Company for a 780 MM Btu/hr steam methane reformer furnace fired on refinery gas, issued 5/19/04. This CO emissions limit is achieved in practice based on operating history and compliance source test of the unit and the furnace manufacturer's guarantee. (Units equipped with SCR allow optimal burner tuning for CO emissions, while achieving the required BACT NOx limits.)

   Lower emission levels or more effective control options for CO were not identified for any refinery heater fired on treated refinery gas and having capacity of 50 MM Btu/hr or more.

Step 2 - Eliminate Technologically Infeasible Options

The listed option is feasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. 10 ppmv @ 3% O2 (SCR and Burner Tuning)

Step 4 - Cost Effectiveness Analysis

The applicant is proposing a CO emissions limit of 10 ppmv @ 3% O2. As there is no more effective control listed, a cost effectiveness analysis is not required for CO.

Step 5 - Select BACT

1. 10 ppmv @ 3% O2 (SCR and Burner Tuning)

BACT for PM_{10} and SOX

Step 1 - Identify All Possible Control Technologies

For combustion sources (boilers, turbines, process heaters, etc.) fired on gaseous or light distillate liquid fuels, SO_x is generally controlled by the selection of the fuel type and the maximum allowable fuel sulfur content. Total reduced sulfur compounds, including H_2S, are completely oxidized in the combustion process to form SO_x. Post combustion controls have generally not been found to be as effective, practical or cost effective as pretreatment of the fuel.

There are no generally accepted emission factors available to estimate PM_{10} emissions from units fired on refinery fuel gas. Therefore, it is not possible to quantify a PM_{10} emission reduction due to using treated fuel gas. However, as SO_2 is a considered a precursor to PM_{10}, emission controls that reduce the sulfur in the fuel will reduce the emissions of both SO_2 and PM_{10}.

1. Treated Refinery Fuel (0.75 grain H_2S/100 scf)

   This option is listed as technologically feasible for SOx in District BACT Guideline 1.8.2, Process Heater, Refinery, >50 MM BTU/hr. This option can be achieved using a non-industry standard fuel gas sulfur treating system, such as SulfaTreat. Sulfa Treat type systems are not employed in any meaningful way in refineries to recovery sulfur. In fact, the sulfur is not recovered, but is chemically fixed with the treating chemical and must be disposed. The chemical and disposal costs associated with Sulfa Treat type systems are very high when compared to amine treating systems.

2. Treated Refinery Fuel (35 ppmv S as H_2S)

   This option is listed as technologically feasible BACT in the EPA's RBLC database (AZ-0046), for process heaters permitted at the Arizona Clean Fuels Yuma facility. This limit was proposed by Arizona Clean Fuels and was accepted as technologically feasible BACT by the Arizona Department of Environmental Quality (ADEQ). The applicant did not offer and ADEQ did not require a specific technical basis for the proposed limit. ADEQ did state that this limit is not being enforced for any refinery in the country and implied that the limit is technology forcing. The Arizona Clean Fuels project is a green field site construction and, if built, would be the first refinery in Arizona and the first totally new refinery in the United States in over 20 years.

3. Treated Refinery Fuel (50 ppmv H_2S and 100 ppmv total reduced sulfur)

   This limit is listed as technologically feasible in the Bay Area AQMD BACT Guidelines – Document # 94.3.1, Heater/Refinery Process, > 50 MM BTU/hr.

4. Treated Refinery Fuel (100 ppmv total reduced sulfur)

   This limit is listed as achieved in practice in the Bay Area AQMD BACT Guidelines – Document # 94.3.1, Heater/Refinery Process, > 50 MM BTU/hr. In addition, a 100 ppmv total sulfur (as H2S) limit applies to heaters 14-H1 and 14-H2 at the Refinery (permit unit S-33-13) on a 3-hour rolling average basis.

   The applicant has proposed option 4 above.

Step 2 - Eliminate Technologically Infeasible Options

2. Treated Refinery Fuel (35 ppmv S as H_2S)

   As stated above, this limit was required for the Arizona Clean Fuels (ACF) Yuma facility, which received a PSD permit in 2005. In their evaluation, the Arizona Department of Environmental Quality (ADEQ) identified this limit as more stringent than any limit currently imposed for any refinery operating in the United States. The ADEQ considered this limit to be technology forcing, but achievable for a new refinery using an industry standard amine treating system with MDEA solution.

   The ADEQ technical support document issued February 2005 states that the permittee initially proposed a 140 ppmv sulfur limit, but based on a further review of emission levels achieved by other refinery fuel gas fired combustion sources, the Department determined that a refinery fuel gas sulfur content limit of 35 ppmv is representative of the achievable level with amine contactors. No specific citations or references were given to support this fuel sulfur content limit. The agency was contacted through the permitting engineer for this project, who confirmed that there was no specific information available (test results, correspondence, manufacturers information, etc) to support the 35 ppmv limit. The limit was determined to be achievable for the ACF facility based primarily on the engineer's refinery industry experience and on the permittee's acceptance of the limit.

   Like Arizona Clean Fuels, Big West of California is proposing to install a fuel gas amine treating system using MDEA solution. The system will serve the new vacuum gas oil hydrodesulfurizer (S-33-408) and two existing units, the HCU and HTU-3. The design and build contractor for the amine treatment system, Linde BOC Process Plants LLC, has modeled the performance of the system with respect to the given set of design parameters. Linde states the removal efficiency of the proposed amine treating system using MDEA will be limited by the lowest of the pressures from the incoming streams, i.e., from the HCU unit. Based on this limiting pressure, the maximum theoretical amine loading (mol H_sS/mol amine), maximum H_2S reduction and final fuel gas H_2S limit were determined. Based on the modeling results, Linde will guarantee a fuel gas H_2S limit of 60 ppmv.

   A copy of the Linde's correspondence regarding amine system performance to IAG, the overall design contractor, is included above in the BACT review for refinery heater < 50 MM Btu/hr, Attachment BACT HTR<50 -B.

   Given that an industry standard amine treating system is proposed and that the system has been optimized to the extent possible for maximum H2S removal given the design parameters inherent at the existing Big West facility, it is reasonable to conclude that achieving a fuel gas H_sS limit of 35 ppmv is not technologically feasible for the Big West Clean Fuels project. Further, the 35 ppmv sulfur limit (as H_sS) required for the Arizona Clean Fuels facility must, at this time, only be considered theoretically feasible. The limit was not supported by any technical demonstration or emissions test results from any existing facility or by a manufacturer's design proposal.

3. Treated Refinery Fuel (50 ppmv H_2S and 100 ppmv Total Reduced Sulfur)

   Option 3, which limits the H_2S content to 50 ppmv and the total reduced sulfur content to 100 ppmv, is no more stringent in terms of post-combustion SO_x emissions than option 4, which solely contains a limit on the total reduced sulfur content of 100 ppmv. As such, option 3 is equivalent to option 4. Therefore, option 3 will not be considered further.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. Treated Refinery Fuel (0.75 grain H_2S/100 scf or 12 ppmv H_2S)

2. Treated Refinery Fuel (100 ppmv total reduced sulfur)

Step 4 - Cost Effectiveness Analysis

Included as Appendix BACT HTR>50 -A is a cost effectiveness analysis that demonstrates that reducing the sulfur content of the refinery gas to 0.75 grain (as H2S)/100 scf (12 ppmv as H2S) using a SufaTreat system is not a cost effective control option. This cost effectiveness analysis evaluates the cost to install and operate a SulfaTreat fuel gas sulfur removal system having a capacity to reduce the sulfur content of 1141 MM Btu/hr of refinery gas (the total heat input capacity of all refinery fuel fired units proposed for the Big West Clean Fuels project) from 160 to 12 ppmv as H2S, with a corresponding reduction in stack SO2 emissions. The calculated cost per ton of SO2 reduced was $4,982, which exceeds the cost effectiveness threshold value of $3900/ton reduced. Therefore, control option 1 above is not cost effective and has been eliminated.

Step 5 - Select BACT

1. Treated refinery fuel with no more than 100 ppmv total reduced sulfur (3-hour rolling average).

   As the applicant has proposed the highest ranked control option that is technologically feasible and cost effective, BACT for PM_{10} and SO_x have been satisfied.

Attachment BACT HTR>50 - A

Cost Effectiveness of Sulfatreat System

Cost Effectiveness of Fuel Gas Treatment for Sulfur Removal

160 ppmv H_2S to 12 ppmv H_2S

CFP Combustion Emissions

Total Heat Capacity, CFP Combustion Units	1141.3	MMBtu/hr
SO_2 EF @ 160 ppmv H2S	0.023	lb/MMBtu
SO_2 EF @ 12 ppmv H2S	0.002	lb/MMBtu
SO_2 Reduction	104.09	Tpy

Calculations:

SO_2 EF = ppmv / (1200 MMBtu/MMscf) / (379.4 scf/lb-mol) x (64.0588 lb/lb-mol)

SO_2 Reduction = (SO_2 $EF_{Uncontrolled}$ - SO_2 $EF_{Controlled}$) x (Total Heat Capacity) x (8760 hr/yr) / (2000 lb/ton)

Capital Costs:	
Purchased Equipment:	
Vessels	$100,000
Monitoring equipment	$200,000
Purchased Equipment Cost (PEC)	$300,000
Direct Installation:	
Foundations	$5,000
Piping/Instrument/Electrical	$15,000
Direct Installation Cost (DIC)	$20,000
Indirect Costs:	
Engineering (10% of PEC)	$30,000
Contigency (3% of PEC)	$9,000
Indirect Capital Cost (ICC)	$39,000
Total Capital Cost (TCC) TCC = PEC + DIC + ICC	$359,000

Note: Purchased equipment and treating chemical costs provided by the MI-SWACO.
Note: ICC estimation method follows guidance in EPA Air Pollution Control Cost Manual, 6th Ed.

Ongoing SulfaTreat XLP Media Costs:	
SulfaTreat XLP media, per lb ST-XLP	$0.79
Media shipment, per lb ST-XLP	$0.10
Change-out, per lb ST-XLP	$0.05
Disposal, per lb ST-XLP	$0.05
Total cost per lb ST-XLP	$0.99
Pounds ST-XLP per lb SO_2 reduction	2.14
Cost per ton of SO_2 reduction	$4,228.79

Annual Costs:	
ST-XLP (cost per ton x tpy reduction)	$440,183
Annual O&M	$20,000
Capital Recovery Cost	$58,426
Total Annual Costs	$518,609
Cost per ton SO_2 Reduction	$4,982
BACT Cost Effectiveness Limit	$3,900

Calculations:

Capital Recovery Cost = (Total Capital Costs) x $(i(1+i)^n)/((1+i)^n-1)$

Per District Policy APR 1305:

interest rate (i)	10%
equipment life in years (n)	10

BACT ANALYSIS
Catalyst Regeneration - Fluid Catalytic Cracking Unit
Full Burn Design

I. Proposal

As part it's refinery upgrade project, Big West of California is proposing the installation of a fluid catalytic cracking unit (FCCU). The proposed unit will be a full burn design. Full burn units inherently have a high degree of combustion of coke in the regenerator and low CO emissions. The unit will be equipped with selective catalytic reduction (SCR) for NOx control and a high temperature filtering system (Pall filter) for particulate matter control. The feed to the FCCU will be aggressively hydrotreated to remove sulfur and ammonia contaminants, which will reduce the resulting SO_2 and particulate emissions from the unit. As there is no applicable District BACT guideline, BACT for FCCUs will be evaluated.

II. EMISSION CONTROL TECHNOLOGY EVALUATION:

A. BACT Applicability

District Rule 2201 Section 4.1 requires that BACT be applied to any unit with an IPE of any affected pollutant of greater than 2 lb/day. Daily emissions from the FCCU are NO_x: 258.5 lb/day, SO_x: 281.0 lb/day, PM_{10}: 222.0 lb/day, CO: 362.7 lb/day and VOC: 66.7 (non-fugitive). Since the IPE is greater than 2.0 lb/day for each affected pollutant, BACT is required for each affected pollutant for the FCCU.

B. BACT Policy

As there is no applicable District BACT guideline, a new BACT guideline covering FCCUs is required and has been developed in accordance with the District's BACT policy.

EPA's RACT/BACT/LAER Clearinghouse (RBLC) at http://www.epa.gov/ttn/catc/rblc/htm/welcome.html was reviewed. None of the BACT identified from EPA's RBLC was more stringent than that identified from the sources listed below.

The USEPA's Petroleum Refinery Initiative (PRI), the Bay Area Air Quality Management District (BAAQMD) BACT Guidelines, the South Coast Air Quality Management District (SCAQMD) BACT guidelines and rulebook and the applicant's proposed emissions control equipment and limits were used in developing the guideline.

The US EPA's National Petroleum Refinery Initiative (PRI) was primarily used to identify control technologies and emissions from FCCUs. The PRI is an integrated enforcement and compliance strategy to address air emissions from the nation's petroleum refineries. Since March 2000, the agency has entered into 17 settlements with U.S. companies that refine nearly 77 percent of the nation's petroleum refining capacity. These settlements cover 85 refineries in 25 states and on full implementation will result in annual emissions reductions on approximately 80,000 tons of nitrogen oxides and approximately 235,000 tons of sulfur dioxide.

EPA's investigations focused on the four most significant Clean Air Act compliance challenges for the industry and the emissions units that are the source of most of their pollution, including FCCUs.

The consent degree entered into with BP/Amoco is illustrative of the types of control technologies and emissions limits identified by EPA as appropriate and achievable for FCCUs.

The consent degree with BP/Amoco was signed on January 18, 2001 and is similar in scope to the agreements reached with the other 16 refiners. The parties amended the consent degree on four separate occasions, most recently in July 2005.

The fourth amendment to the decree finalized emissions limits for NO and SOx from the affected FCCUs. The finalized emissions limits were based on operational, source test and other information available from the affected FCCUs that were retrofitted with emission controls.

Emissions limits and control technologies for particulate matter were identified in SCAQMD Rule 1105.1, *Reductions of PM_{10} and Ammonia Emissions From Fluid Catalytic Cracking Units,* the consent degrees reached with Chevron and the applicant's proposal to use an innovative high temperature filtering system (Pall Filter).

Emissions limits and control technologies for carbon monoxide were identified from the Bay BAAQMD operating permit issued to Chevron's Richmond California facility and the consent degrees reached with Chevron.

C. Top Down BACT Analysis for Permit Unit S-33-410-0 (FCCU)

<u>**BACT for VOC**</u>

Step 1 - Identify All Possible Control Technologies

1. Good Combustion Practices

   The applicant proposed the above-listed control option. No other control options or alternate basic equipment for VOC emissions were identified.

Step 2 - Eliminate Technologically Infeasible Options

The listed option is technologically feasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. Good Combustion Practices

Step 4 - Cost Effectiveness Analysis

A cost-effective analysis is not required as the applicant is proposing the option with the highest control efficiency.

Step 5 - Select BACT

1. Good Combustion Practices

<u>BACT for NOx</u>

Step 1 - Identify All Possible Control Technologies

1. 20 ppmv @ 0% O2 (365 day rolling average) and 40 ppmv @ 0% O2 (7 day rolling average (SCR).

   This applicant has proposed the above-listed control option and emission limits. These emission limits were accepted as the final emissions limits in the BP/Amoco consent degree and were the most stringent limits accepted as final emissions limits in any of the consent decrees that were approved as part of EPA Petroleum Refinery Initiative. Lower limits were not identified in any BACT guideline or on any operating permit for an FCCU unit. These limits were achieved using SCR, NSCR or an equivalent alternative technology, and have been demonstrated through emissions source testing. These limits are achieved in practice.

   The above-listed limits apply at all times except during startup and shutdown events. During such events applicant shall comply with a District approved set of work practice standards. Applicant shall provide a detailed description and timeline for the startup/shutdown event, a list of the work practice standards to be utilized, and the effect each word practice standard has on emissions.

Step 2 - Eliminate Technologically Infeasible Options

The above listed limits have been found to be feasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. 20 ppmv @ 0% O2 (365 day rolling average) and 40 ppmv @ 0% O2 (7 day rolling average (SCR), and District approved work practice standards during startup and shutdown events.

Step 4 - Cost Effectiveness Analysis

As the applicant is proposing the highest ranked control option, a cost effectiveness analysis is not required.

Step 5 - Select BACT

1. 20 ppmv @ 0% O2 (365 day rolling average) and 40 ppmv @ 0% O2 (7 day rolling average (SCR), and District approved work practice standards during startup and shutdown events.

BACT for CO

Step 1 - Identify All Possible Control Technologies

1. 59 ppmv @ 0% O2 on 365 day rolling avg and 78 ppmv @ 0% O2 on a 30 day rolling avg

   This applicant has proposed a full burn unit with the above listed emission limits. Full burn units do not employ a CO boiler. These emission limits are referenced from the BAAQMD permit to operate for Chevron's Richmond Refinery FCCU. These limits have been achieved in practice.

   These were the most stringent limits identified from any source for a full burn unit, including any of the emissions limits in any of the consent decrees that were approved as part of EPA Petroleum Refinery Initiative.

   The above-listed limits apply at all times except during startup and shutdown events. During such events applicant shall comply with a District approved set of work practice standards. Applicant shall provide a detailed description and timeline for the startup/shutdown event, a list of the work practice standards to be utilized, and the effect each word practice standard has on emissions.

Step 2 - Eliminate Technologically Infeasible Options

The above listed option is feasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. 59 ppmv @ 0% O2 on 365 day rolling avg and 78 ppmv @ 0% O2 on a 30 day rolling avg and District approved work practice standards during startup and shutdown events.

   Full burn technology.

Step 4 - Cost Effectiveness Analysis

As the applicant is proposing the highest ranked control option, a cost effectiveness analysis is not required.

Step 5 - Select BACT

1. 59 ppmv @ 0% O2 on 365 day rolling avg and 78 ppmv @ 0% O2 on a 30 day rolling avg (achievable with full burn design) and District approved work practice standards during startup and shutdown events.

BACT for PM_{10}

Step 1 - Identify All Possible Control Technologies

1. 0.5 lb PM_{10}/1000 lb of coke burned (Hydrotreating of Feed and Pall Filter)

   The applicant has proposed the above listed limit. This limit has been identified in the consent decrees reached with Exxon Mobil and Sunoco as part of EPA's Petroleum Refinery Initiative. These were the most stringent limits accepted as final emissions limits in any of the consent decrees that were approved as part of the EPA Petroleum Refinery Initiative. This limit was lower than any limit identified for total PM_{10} particulate in any BACT guideline reviewed for this project.

   The limit of 0.5 lb PM_{10}/1000 lb of coke burned is not directly comparable to any of the limits allowed by SCAQMD Rule 1105.1, *Reductions of PM_{10} and Ammonia Emissions From Fluid Catalytic Units,* as it is applicable to total particulate and the Rule 1105.1 limits apply only to the filterable PM_{10} particulate fraction. Compliance with SCAQMD Rule 1105.1 can be met by meeting any of the following limits: 3.6 lb/hr, 0.005 gr/dscf or 2.8 lbs/1,000 barrels of fresh feed.

   Based on source test results, SCAQMD estimated that for the affected population of FCCUs, the condensable fraction contributed 88% of total PM_{10}. Inferring the same percentages of filterable and condensable particulate, a limit of 3.6 lb/hr for filterable particulate would translate to 30 lb/hr for total particulate. At the maximum design coke burn rate of 18,500 lb/hr, the Big West FCCU will emit total PM_{10} particulate at a rate of 9.25 lb/hr, significantly less than an equivalent rate that would be inferred by Rule 1105.1.

   In developing Rule 1105.1, SCAQMD primarily evaluated the performance of dry electrostatic precipitators (ESP) in determining achievable emissions limits for FCCUs. ESPs operate within the high temperature range (500 – 600° F) of the FCCU exhaust and provide control for filterable particulate only. The condensable fraction passes through the ESP and is emitted as PM_{10}.

Like an ESP, the Pall filter will operate within the same high temperature range (500 – 600° F) of the FCCU exhaust and will only control filterable particulate. The Pall filter is expected to achieve emission reduction efficiencies for filterable particulate equivalent to an ESP, based on manufacturers information. The Pall filter has a design removal efficiency of 99.97% at 1.3 micron. The Pall filter represents an innovative technology, with the Big West installation being the first use for a U.S. refinery.

Big West believes that it will be able to meet a limit of 0.5 lb/1000 lb of coke burned for total particulate (combined filterable and condensable fractions) due, in large part, to the aggressive hydrotreating of the gas oil feedstock. Hydrotreating in the VGO-HDS unit will remove a very high percentage of gas oil sulfur and ammonia, which would otherwise potentially be admitted as condensable particulate.

Step 2 - Eliminate Technologically Infeasible Options

The listed option is feasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. 0.5 lb PM_{10} / 1000 lb of coke burned

Step 4 - Cost Effectiveness Analysis

As the applicant is proposing the highest ranked control option, a cost effectiveness analysis is not required for PM10.

Step 5 - Select BACT

1. 0.5 lb PM_{10} / 1000 lb of coke burned

<u>BACT for SOx</u>

Step 1 - Identify All Possible Control Technologies

1. 20 ppmv @ 0% O2 (365 day rolling average) and 50 ppmv @ 0% O2 (7 day rolling average,)

   This applicant has proposed the above-listed emission limits. These emissions limits were accepted as the final emissions limits in the BP/Amoco consent degree and were the most stringent limits accepted as final emissions limits in any of the consent decrees that were approved as part of EPA Petroleum Refinery Initiative. These limits are achievable by aggressively hydrotreating of FCCU feed and using SO_2 reducing catalyst additives. These limits are achieved in practice.

Wet scrubbing of the flue gas using NaOH or other alkali is a method that is also used to control sulfur emissions from FCCUs and from boilers and steam generators burning high sulfur fuel or waste gas. A control efficiency exceeding 95% or a maximum stack emissions concentration of less than 30 ppmv as SO_2 are attainable using wet scrubbing, as referenced from District BACT guideline 1.2.3, Oilfield Steam Generator/TEOR Gas Incinerator. Based on this information, wet scrubbing offers no advantage over the application of a SO_2 reducing catalyst to an FCCU whose feed has been aggressively hydrotreated.

There were no more stringent emissions limits for SOx identified in the BACT review.

Step 2 - Eliminate Technologically Infeasible Options

The option is feasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. 20 ppmv @ 0% O2 (365 day rolling average) and 50 ppmv @ 0% O2 (7 day rolling average,)

Step 4 - Cost Effectiveness Analysis

As the applicant is proposing the most effective control listed, a cost effectiveness is not required for SO_x.

Step 5 - Select BACT

1. 20 ppmv @ 0% O2 (365 day rolling average) and 50 ppmv @ 0% O2 (7 day rolling average,)

BACT ANALYSIS
Refinery Flare

I. Proposal

As part it's refinery upgrade project, Big West of California is proposing the installation of a ground level, multi point refinery flare. Seven determinations for flares are listed in the District's BACT clearinghouse (1.4.1 through 1.4.7), though none of the determinations specifically address refinery flares. Therefore, the District will evaluate BACT for refinery flares.

II. EMISSION CONTROL TECHNOLOGY EVALUATION:

A. BACT Applicability

Each of the two proposed safety flares will have emissions of greater than 2.0 lb/day of each affected pollutant; therefore BACT is required for each flare for each affected pollutant.

B. BACT Policy

Though there are District BACT guidelines for flares serving oil production, oil well testing, landfills and digesters, there is no guideline specifically addressing refinery flares. Therefore, a BACT analysis will be preformed for this class and category of source.

The existing District BACT Guidelines for oil production and testing and waste gas incineration flares were used to identify the control technologies are potentially applicable to refinery flares. The following additional resources were also reviewed: Bay Aera AQMD (BAAQMD) guideline for refinery flares, # 82.1, SCAQMD BACT guideline for refinery process valves and pressure relief devices application number 388982, District Rule 4311, *Flares (as Adopted June 20, 2002)*, *Air Permit Technical Guidance for Chemical Sources, RG-109 October 2000, Draft,* Texas Commission on Environmental Quality, and 40 CFR § 60.18.

At refineries flares are typically used to control VOC streams discharged during upset and emergency situations from process equipment and during startup and shutdown of process equipment. These streams typically contain H2S and other sulfur compounds that must also be controlled for safety and nuisance reasons.

The District's BACT Clearinghouse (1.4.1 through 1.4.7) generally describe BACT for the control of VOC using a flare as smokeless operation and some manner to promote efficient combustion, either air or steam injection or the specification of a Coanda type burner. Pilot specifications are included. The controls that are identified as BACT for VOC are also identified as BACT for NOx, PM, SOx and CO. In certain of the guidelines for non-emergency flaring, a caustic scrubbing system is listed as BACT for sulfur emissions.

BAAQMD guideline for refinery flares, # 82.1, also specifies air or steam injection and additionally lists staged combustion to promote combustion efficiency. Guideline #82.1 lists as a technologically feasible option, an enclosed, ground level flare with VOC destruction efficiency ≥98.5%. The destruction efficiency of an enclosed flare is assumed to be marginally higher (98.5% vs. 98%) than that of non-enclosed flare.

BAAQMD BACT Guideline #82 and SCAQMD BACT guideline 388982 additionally list as an achieved in practice control a flare gas recovery system for the routine venting of process gases. The flares proposed by Big West are primarily safety flares, which will be used to control the unanticipated venting of gasses from process units during emergency or breakdown situations. The main ground level, staged flare will also be authorized to burn a limited volume of gasses released during process unit startup and shutdown situations. An enforceable gas volume limit and other permit restrictions will be established for the ground level, staged flare.

C. BACT Analysis for Permit Units S-33-413-0

<u>BACT for VOC</u>

Step 1 - Identify All Possible Control Technologies

1. Enclosed ground level flare or any other engineered flare designed for and operated without visible emissions, except as allowed by 40CFR 60.18(c)(1) and District Rule 4101, and with a VOC destruction efficiency of ≥98.5%. Flare design shall include air or steam assisted combustion, staged combustion, and/or equivalent District approved controls. Flare shall be equipped with a flare gas recovery system for non-emergency releases, a continuous pilot or District approved alternative and a method for detecting flame. Pilot and sweep fuel shall be natural gas, treated refinery gas or LPG.

2. Engineered flare designed for and operated without visible emissions, except as allowed by 40CFR 60.18(c)(1) and District Rule 4101, and with a VOC destruction efficiency of ≥ 98%. Flare design shall include air or steam assisted combustion, staged combustion, and/or equivalent District approved controls. Flare shall be equipped with a flare gas recovery system for non-emergency releases, a continuous pilot or District approved alternative and a method for detecting flame. Pilot and sweep fuel shall be natural gas, treated refinery gas or LPG.

Step 2 - Eliminate Technologically Infeasible Options

In general, both of the listed options are considered feasible. However, factors other than VOC destruction efficiency may be considered in selecting a flare for a particular installation. The importance of these factors may outweigh the small potential assumed emissions control benefit of an enclosed, ground level flare. Based on the discussion below, the use of enclosed, ground level flares is not feasible for the Big West refinery upgrade project.

Flares of various designs are employed at refineries to dispose of waste gas streams in emergency and non-emergency situations. Depending on the process to be controlled, refinery flares may be elevated or ground level, enclosed or open, and have single or multiple burners. In addition to high destruction efficiencies and smokeless operation, factors that go into the choice of a flare design include cost, process requirements, and safety, comfort, visibility and noise considerations.

A ground level, multi-point flare was selected to serve the process units being added in the Big West refinery upgrade. The multi-point flare will have both low and high-pressure sections, with each section having multiple stages. As the flow rate to the flare increases, additional stages are opened to keep the pressure within the specified limits for each section. All low-pressure section stages and the first stage of the high-pressure section will be steam assisted.

The multipoint flare was selected because the design allows for the emergency flaring of a wide range of flow rates at both high and low pressures. It would take multiple enclosed, ground flares operated in conjunction with high-pressure flare (either elevated or ground level) to provide the same service as the multi-point system.

The applicant discussed flaring requirements with Bekart, a provider of enclosed burners that are being offered as a potentially "cleaner" alternative to traditional flares, and John Zink and Callidus, who offer enclosed ground level flares. Bekart indicated that the enclosed burner they offer would not be a good choice, as it is not well suited for emergency flaring and that up to 15 individual units would be required to accommodate the Clean Fuels Project flaring requirements. John Zink and Callidus have confirmed that the enclosed, ground level flares that they offer are not expected to have any better performance or lower emissions of VOC or NOx than the non-enclosed flares they offer. In fact, Callidus indicated that enclosed flares are expected to have higher combustion temperatures and higher NO_x emissions than non-enclosed flares. As with the Bekart enclosed burner, the enclosed, ground level flares from either John Zink or Callidus are not ideally suited for burning emergency releases of gas, and given the project's projected flaring requirements, several individual enclosed, ground level flares would be required.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. Engineered flare designed for and operated without visible emissions, except as allowed by 40CFR 60.18(c)(1) and District Rule 4101, and with a VOC destruction efficiency of ≥98%. Flare design shall include air or steam assisted combustion, staged combustion, and/or equivalent District approved controls. Flare shall be equipped with

a flare qas recovery system for non-emergency releases. Flare shall be equipped with a continuous pilot or District approved alternative, a method for detecting flame and shall use natural gas or LPG pilot fuel.

Step 4 - Cost Effectiveness Analysis

As the applicant is proposing the highest ranked control option not eliminated in Step 2, a cost effectiveness analysis is not required.

Step 5 - Select BACT

1. Engineered flare designed for and operated without visible emissions, except as allowed by 40CFR 60.18(c)(1) and District Rule 4101, and with a VOC destruction efficiency of ≥ 98%. Flare design shall include air or steam assisted combustion, staged combustion, and/or equivalent District approved controls. Flare shall be equipped with a flare gas recovery system for non-emergency releases, a continuous pilot or District approved alternative and a method for detecting flame. Pilot and sweep fuel shall be natural gas, treated refinery gas or LPG.

BACT for NOx

Promoting efficient combustion through the use of an engineered flare with air or steam injection or multiple stages is expected to result in lower emissions of NOx than if the control were not applied. A flare gas recovery system has the advantage of minimizing the amount of gas flared, which is an inherently lower emitting strategy.

In some refinery configurations, an enclosed flare or enclosed burner with air or steam assisted combustion, staged combustion, and/or equivalent District approved controls may be capable of achieving demonstrated emissions of NOx of less than 0.068 lb/MM Btu.

Additional technologies or methods for controlling NO_x have not been identified.

Step 1 - Identify All Possible Control Technologies

1. Engineered flare or enclosed burner with air or steam assisted combustion, staged combustion, and/or equivalent District approved controls and achieving demonstrated NO_x emissions less than 0.068 lb/MM Btu. Flare shall be equipped with a flare gas recovery system for non-emergency releases.

2. Engineered flare, with air or steam assisted combustion, staged combustion, and/or equivalent District approved controls. Flare shall be equipped with a flare gas recovery system for non-emergency releases.

Step 2 - Eliminate Technologically Infeasible Options

As discussed above in the technology review for VOC, an enclosed burner, such as that offered by Bekart, is not feasible option for the emergency flaring requirements of the Clean Fuels Project. Based on information provided by the manufacturers, enclosed ground level flares from John Zink and Callidus are not expected to achieve NO_x emissions less than the 0.068 lb/MM Btu.

Therefore, option 1 above is eliminated as infeasible for the proposed configuration.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. Engineered flare with air or steam assisted combustion, staged combustion, and/or equivalent District approved controls. Flare shall be equipped with a flare gas recovery system for non-emergency releases.

Step 4 - Cost Effectiveness Analysis

As the applicant is proposing the highest ranked control option not eliminated in Step 2, a cost effectiveness analysis is not required.

Step 5 - Select BACT

1. Engineered flare, with air or steam assisted combustion, staged combustion, and/or equivalent District approved controls. Flare shall be equipped with a flare gas recovery system for non-emergency releases.

<u>BACT for CO</u>

Promoting efficient combustion through the use of an engineered flare with air or steam injection or multiple stages is expected to result in lower emissions of CO than if the control were not applied. A flare gas recovery system has the advantage of minimizing the amount of gas flared, which is an inherently lower emitting strategy.

Additional technologies or methods for controlling CO emissions have not been identified.

Step 1 - Identify All Possible Control Technologies

1. Engineered flare, with air or steam assisted combustion, staged combustion, and/or equivalent District approved controls. Flare shall be equipped with a flare gas recovery system for non-emergency releases.

Step 2 - Eliminate Technologically Infeasible Options

The option identified above is feasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. Engineered flare, with air or steam assisted combustion, staged combustion, and/or equivalent District approved controls. Flare shall be equipped with a flare gas recovery system for non-emergency releases.

Step 4 - Cost Effectiveness Analysis

As the applicant is proposing the highest ranked control option not eliminated in Step 2, a cost effectiveness analysis is not required.

Step 5 - Select BACT

1. Engineered flare, with air or steam assisted combustion, staged combustion, and/or equivalent District approved controls. Flare shall be equipped with a flare gas recovery system for non-emergency releases.

<u>BACT for SOx</u>

A flare gas recovery system that minimizes the amount of gas flared and the use of natural gas, LPG and/or treated refinery gas for the pilot and for purging are the only options identified for controlling SO_x emissions from emergency flares.

Step 1 - Identify All Possible Control Technologies

1. Engineered flare with a flare gas recovery system for non-emergency releases and the use of natural gas, LPG or treated refinery fuel for the pilot and for purging.

Step 2 - Eliminate Technologically Infeasible Options

The option identified above is feasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. Engineered flare with a flare gas recovery system for non-emergency releases and the use of natural gas, LPG or treated refinery fuel for the pilot and purge.

Step 4 - Cost Effectiveness Analysis

As the applicant is proposing the highest ranked control option not eliminated in Step 2, a cost effectiveness analysis is not required.

Step 5 - Select BACT

1. Engineered flare with a flare gas recovery system for non-emergency releases and the use of natural gas, LPG or treated refinery fuel for the pilot and for purging.

BACT for PM_{10}

The requirements that the flare be designed and operated without visible emissions and be equipped with air or steam assisted combustion, staged combustion, and/or equivalent District approved controls are expected to result in lower emissions of PM_{10} than if these requirements and controls were not applied. A flare gas recovery system has the advantage of minimizing the amount of gas flared, which is an inherently lower emitting strategy.

Additional controls or techniques for reducing PM_{10} from flares were not identified.

Step 1 - Identify All Possible Control Technologies

1. Engineered flare designed for and operated without visible emissions, except as allowed by 40CFR 60.18(c)(1) and District Rule 4101 and equipped with air or steam assisted combustion, staged combustion, and/or equivalent District approved controls. Flare shall be equipped with a flare gas recovery system for non-emergency releases. Pilot and purge gas shall be natural gas, treated refinery gas or LPG.

Step 2 - Eliminate Technologically Infeasible Options

The option identified above is feasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. Engineered flare designed for and operated without visible emissions, except as allowed by 40CFR 60.18(c)(1) and District Rule 4101 and equipped with air or steam assisted combustion, staged combustion, and/or equivalent District approved controls. Flare shall be equipped with a flare gas recovery system for non-emergency releases. Pilot and purge gas shall be natural gas, treated refinery gas or LPG.

Step 4 - Cost Effectiveness Analysis

As the applicant is proposing the highest ranked control option not eliminated in Step 2, a cost effectiveness analysis is not required.

Step 5 - Select BACT

1. Engineered flare designed for and operated without visible emissions, except as allowed by 40CFR 60.18(c)(1) and District Rule 4101 and equipped with air or steam assisted combustion, staged combustion, and/or equivalent District approved controls. Flare shall be equipped with a flare gas recovery system for non-emergency releases. Pilot and purge gas shall be natural gas, treated refinery gas or LPG.

BACT ANALYSIS
SWAATS Unit

I. Proposal

As part of it's refinery upgrade project, Big West of California is proposing the installation of a Sour Water Ammonia to Ammonium Thiosulfate (SWAATS) Unit, S-33-409-0. This unit will produce ammonium thiosulfate (ATS) solution, a marketable liquid fertilizer product, utilizing the sulfur and ammonia removed by the vacuum gas oil hydro-desulfurization unit (VGO-HDS), S-33-408-0. The VGO-HDS produces sour water and sour gas streams that must be further treated. The sour water stream goes to the sour water stripper and the sour gas stream to the amine unit. The sulfur and ammonia contaminants liberated from these units, as sour water stripper off-gas (SWSG) and amine acid gas respectively, are sent to the SWAATS unit for conversion into the ATS solution. The ATS solution will be trucked from the plant.

II. EMISSION CONTROL TECHNOLOGY EVALUATION:

A. BACT Applicability

District Rule 2201 Section 4.1 requires that BACT be applied to any unit with an IPE of any pollutant greater than 2 lb/day. Emissions from the SWAATS are SOx: 44.2 lb/day, CO: 64.4 lb/day, VOC: 32.6 lb/day, and PM10: <2 lb/day through the use of a high efficiency mist eliminator. Since the IPE is greater than 2.0 lb/day for SOx, CO and VOC and the SSPE for CO exceeds 200,000 lb/yr, BACT is required for SOx, CO and VOC for the SWAATS unit.

B. BACT Policy

As there is no applicable District BACT guideline, a new BACT guideline covering SWAATS units is required and has been developed in accordance with the District's BACT policy.

A review of the EPA RACT-BACT-LAER Clearinghouse (RBLC) showed no entries pertaining to ammonium thiosulfate production units. The BACT database for the South Coast Air Quality Management District has one entry for Ammonium Bisulfate and Thiosulfate Production, but it only addresses BACT for PM_{10} emissions. Particulate emissions are expected to be less than 2 lb/day from this unit through the use of a high efficiency mist eliminator following the scrubber. Bay Area Air Quality Management District (BAAQMD) Guideline 169.1 and District BACT Guideline 7.6.2 apply to refinery sulfur recovery plants. Though the controls, emissions levels and conversion rates listed in these guidelines apply to Claus type sulfur recovery systems with tail gas treating, they have been included here for comparison.

Seventeen (17) operating ammonium thiosulfate plants located at refineries and chemical facilities were surveyed in order to determine what SOx, CO and VOC control technologies and emissions limits have been applied to such facilities. None of these surveyed facilities employ the SWAATS process, which is a recently patented process (2001) from Thiosolv, LLC. As the first commercial unit from Thiosolv is currently under construction, there are no operating SWAATS units for direct comparison. The SWAATS process is novel in that it uses sour water stripper off-gas as the primary feed in the production of the ATS product. The ammonia and H_2S in the sour water stripper off-gas are totally consumed in the process.

The surveyed facilities listed below fall into two general categories, chemical production facilities and facilities operating as an ancillary part of a sulfur removal operation at refineries and gas plants. The surveyed facilities are similar to SWAATS in two important regards: first, sulfur or a sulfur compound is oxidized to produce SO_2 and, second, a scrubber is used to react the ammonia with the SO_2 to produce ATS solution.

Though the specific ATS production method was not identified for any of the facilities listed below, the technical representative from Thiosolve stated that it is typical for a chemical facility to burn elemental sulfur to produce SO_2 and then react the SO_2 in a scrubber with purchased ammonia or ammonia separated from an adjoining process to produce ATS.

Chemical production facilities typically do not use feeds containing VOC and therefore do not emit VOC or CO in the production of ATS. The permits for five of the chemical facilities listed below identify a scrubber as control for SO_2, and two of the permits list emissions limits for SO_2 without a listed control technology, though it is reasonable to conclude these facilities have SO2 scrubbers installed.

The survey of facilities reveals that ATS is also produced at refineries and gas plants in conjunction with the operation of a CLAUS unit or other sulfur recovery technology by burning a side stream of amine acid gas and/or tail gas from the CLAUS to form SO_2, and then reacting that with a purchased or plant produced ammonia. Typically, amine acid gas or tailgas streams will be contaminated with VOC, and thus the process will emit CO when the inlet stream is burned to produce SO_2. The amount of CO emitted is dependent on the inlet VOC concentration. The permits for these facilities did not specify control technologies or emissions limits for VOC or CO, except for the Jupiter Sulphur, LLC facility in Billings, MT, which specified a limit of 0.4 lb/hr for CO. None of the permits identified specific emissions controls for SO_2. Maximum stack SO_2 concentrations are specified for three facilities: Diamond Shamrock, Three Rivers, TX, Jupiter Sulphur, LLC facility in Billings, MT and Statoil A/S Refinery, Kalundborg, Denmark.

The results of that survey are included below.

Summary of Ammonium Thiosulfate Plant Survey Findings

Facility	SO_2 Controls and Limits	CO Controls and Limits	VOC Controls and Limits
Anadarko Table Rock, WY	**Control:** None specified **Limit:** Sulfur recovery efficiency from Claus/ATS units ≥96.3%	None specified	None specified
Valero Energy Corp. Krotz Springs, LA	None Specified	None Specified	None specified
Diamond Shamrock Three Rivers, TX	**Control:** None specified **Limit:** H_2S + SO_2 from ATS Secondary Absorber Vent <250 ppmvd @ 0% O_2	None specified	None specified
A&A Fertilizer Ltd. Beaumont, TX	**Control:** Scrubber **Limit:** None specified	**Control:** None specified **Limit:** 76.6 lb/hr, 61.3 tpy (start-up only)	None specified
Tessenderlo Kerley Pasadena, TX	**Control:** Scrubber **Limit:** 2.09 lb/hr, 9.15 tpy	None specified	None specified
Poole Chemical Texline, TX	**Control:** Scrubber **Limit:** 1.84 lb/hr, 8.05 tpy	None specified	None specified
Agrifos Fertilizer, Inc. Pasadena, TX	None specified	None specified	None specified
Goodpasture	**Control:** Scrubber **Limit:** None specified	None specified	None specified
Jupiter Sulphur, LLC - Ponca City Facility (ConocoPhillips) Ponca City, OK	**Control:** None specified **Limit:** Minimum sulfur recovery (H_2S reduction) of 99.5% of the sulfur contained in the acid gas feed streams	None specified	None specified
Tessenderlo Kerley, Inc. - Finley Facility Kennewick, WA	None specified	None specified	None specified
Montana Sulphur & Chemical Company Billings, MT	**Control:** None specified **Limit:** 9,088,000 lb/yr, 3,577.4 lb/3-hr, 28,618.9 lb/day (combined SRU/ATS stack)	**Control:** None specified **Limit:** "deminimus level as indicated in application"	None specified
Jupiter Sulphur, LLC. – Billings (ConocoPhillips) Billings Refinery Billings, MT	**Control:** None specified **Limit:** 0.3 ton/day, 25.0 lb/hr, 167 ppmvd @ 0% O_2, 12-hr rolling avg. (combined SRU/ATS stack)	**Control:** None specified **Limit:** 1.76 tpy, 0.4 lb/hr	None specified
PVS Chemical Solutions, Inc. Buffalo, NY	**Control:** Packed-gas absorption system (scrubber) **Limit:** None specified	None specified	None specified

NCRA (formerly McPherson Agricultural Products) McPherson, KS	**Control:** None Specified **Limit:** 90 ppmv	None specified	None specified
Tessenderlo Kerley Coffeyville, KS	**Control:** None specified **Limit:** 110 ppmv	None specified	None specified
Statoil A/S Refinery Kalundborg, Denmark	**Control:** None specified **Limit:** 100 ppmv (vendor guarantee)	None specified	None specified

C. BACT Analysis for Permit Unit S-33-409-0, SWAATS

The SWAATS unit consists of two sour water stripper off-gas (SWSG) contactors, an H_2S combustor/catalytic reactor train and an SO_2 wet scrubber.

The principle reaction takes place in the SWSG contactors and is the reduction/oxidation (redox) reaction between sulfide and the sulfite ion, as follows:

$6\ NH_3 + 4\ SO_2 + 2\ H_2S + H_2O \rightarrow 3\ (NH_4)_2S_2O_3$ (ammonium thiosulfate)

This reaction occurs in the SWSG contactors. Within the contactors, a circulating solution of ammonium thiosulfate and ammonium sulfite absorbs the ammonia and some of the H_2S from the SWSG. The absorbed H_2S rapidly reacts with sulfite ion in solution to form thiosulfate ions.

Excess H_2S from the SWSG is combined with amine acid gas and oxidized to provide SO_2 for the reaction. To prevent formation of SO3, the oxidation is carried out in two steps: the first in a combustor with a sub-stoichiometric air supply in which the H_2S is oxidized, and the second at low temperature in a catalytic reactor with excess air. Conversion of all sulfur species, including COS and CS_2, to SO_2 is complete.

The conditions of oxidation do not produce NO_x, as the stream is in a reducing environment when at high temperatures, and is only exposed to an oxidizing environment at the lower temperatures of the catalytic reactor (600 – 900 °F), which is to low for thermal NO_x formation. Hydrocarbon (VOC) will be emitted directly from sulfur scrubber vent, as small amounts of hydrocarbon in the SWSG are absorbed by the ammonium thiosulfate and ammonium sulfite solution and liberated in the scrubber. Gaseous hydrocarbon not absorbed in the SWSG contactors passes to the sub-stoichiometric burner and is oxidized, creating some CO, which is emitted from the scrubber vent.

The SWAATS is designed such that only SO_2, CO and small amounts of VOC will be emitted from the SO2 scrubber exhaust stack. In the SO_2 scrubber, the circulating ammonia rich solution from the SWSG contactors scrubs and reacts the SO_2 with H_2S and NH_3 followed by a water scrubber section to achieve a final outlet concentration of 30 ppmv SO_2 @ 0% O_2. No H_2S is expected in the scrubber exhaust. Water is kept in or removed from the scrubber liquid by controlling the temperature in the scrubber.

Emissions of VOC and CO are dependent upon the amount of hydrocarbon in the feed streams. Hydrocarbon vapor in the SWSG will be minimized prior to the SWAATS. For this purpose, a 3-phase separator with hydrocarbon skimming facilities will allow removal of most hydrocarbons from the sour water stream prior to the sour water strippers. Because the temperature of the SWSG contactors is higher than the temperature in the sour water stripper overhead receiver, most hydrocarbon vapor in the SWSG is expected to pass through the contactors without condensing and, along with any hydrocarbon in the amine acid gas feed to the unit, will be oxidized in the combustor/catalytic reactor to form primarily CO_2, but with some CO. However, as the ABS solution contacts the SWSG in the contactors, small amount of hydrocarbon will be absorbed into the circulating solution from that gas and emitted at the SO_2 scrubber vent and/or removed as a contaminant in the ATS product.

Based on manufacturers information and the use of a high efficiency mist eliminator, emissions of NO_x or PM_{10} are not expected from the SO_2 scrubber exhaust.

<u>BACT for VOC</u>

Step 1 - Identify All Possible Control Technologies

1. incineration of SWSG contactors exhaust and incineration of SO_2 scrubber exhaust

   The above listed limit is technologically feasible using a thermal incinerator on the scrubber exhaust, which would reduce both VOC and CO emissions. The applicant's engineering design consultant evaluated an incinerator to achieve 0 ppmv CO @0%O_2. Such an incinerator would also be expected to reduce VOC emissions by 90% ($\leq$5 ppmv @ 0% O_2). The operation of an incinerator would correspondingly result in increased combustion emissions of NO_x and PM_{10}.

2. incineration of SWSG contactors exhaust and use of an oxidation catalyst on SO_2 scrubber exhaust

3. incineration of SWSG contactors exhaust

   The applicant has proposed the above listed control technology. As designed, the SWAATS unit is expected to have VOC emissions of no more than 33 PPM @ 0% O_2. VOC in the SWSG contactor exhaust will be nearly totally oxidized in the combustor/catalytic reactor. However, small amounts of hydrocarbon in the SWSG will be absorbed into the circulating solution in the contactor and be emitted at the SO_2 scrubber vent or removed as a contaminant in the ATS product.

A review of the permits for facilities operating ATS production units reveals that neither performance based BACT limits nor control technologies have been specified for VOC emissions for any unit.

Step 2 - Eliminate Technologically Infeasible Options

1. incineration of SWSG contactors exhaust and use of an oxidation catalyst on SO_2 scrubber exhaust

   The applicant investigated the option of installing an oxidation catalyst to reduce the CO and VOC in the SWAATS scrubber exhaust. Oxidation catalysts typically require exhaust temperatures above 700 °F to be effective. As the exhaust will exit the SWAATS at approximately 130 °F, an oxidation catalyst is not a viable option without increasing the exhaust temperature.

   The applicant's engineering design consultant has estimated that, given the availability of process heat, installation of a heat exchanger could raise the exhaust temperature to no higher than 400 °F. The applicant has identified a low temperature oxidation catalyst from Engelhard Corporation that is claimed to be effective at temperatures of about 400 °F. However, Engelhard expressed concern that the projected SO_2 levels could lead to catalyst poisoning and a degradation of performance.

   Therefore this option is not considered feasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. incineration of SWSG contactors exhaust and incineration of SO_2 scrubber exhaust

   ($\leq$ 5 ppmv @ 0% O_2)

2. incineration of SWSG contactors exhaust (33 ppmv @ 0% O_2)

Step 4 - Cost Effectiveness Analysis

Option 1:

For CO, the potential reduction in emissions is calculated below, assuming an incinerator would reduce the CO emissions concentration from approximately 100 (manufacturer's estimate of worst case uncontrolled emissions) to 0 ppmv @ % O_2 and that the exhaust rate from the SWAATS is 8.73 MM Scf/day.

$$\frac{8.73\,MM\ scf}{24\,hr} \times \frac{(100-0)\,scf\ CO}{MM\ Scf} \times \frac{lb \cdot mol}{379.4\,scf} \times \frac{28\,lb}{lb \cdot mol} \times \frac{8760\,hr}{yr} \times \frac{ton}{2{,}000\,lb} = 11.76\frac{tons}{yr}$$

For VOC, the potential reduction in emissions is calculated below, assuming an incinerator would reduce the VOC emissions by 99% from the manufacturer's worst-case emissions rate, 1.36 lb/hr.

$$\frac{1.36\,lb}{hr} \times \frac{0.99}{} \times \frac{8760\,hr}{yr} \times \frac{ton}{2{,}000\,lb} = 5.9\frac{tons}{yr}$$

For emissions control technologies that control more than one pollutant, the Multi-pollutant Cost Effectiveness Threshold (MCET) is calculated and compared to the total annualized cost of the control technology to determine if it required as BACT. The MCET is calculated as follows:

$$\frac{11.76\ tons\ CO}{yr} \times \frac{\$300}{ton} + \frac{5.9\,tons\ VOC}{yr} \times \frac{\$5000}{ton} = \frac{\$33{,}028}{yr}$$

The total capital cost to install a 19 MM Btu/hr incinerator is $1,409,215. Annual operating costs were not considered in this evaluation. The applicant provided a detailed capital cost estimate, which is included as Appendix BACT- SWAATS A.

As calculated below, the equivalent annual cost is $229,350/yr, assuming a useful life of 10 years and discount rate of 10%.

$$\begin{aligned} Capital\ Recovery\ Factor &= \left[\frac{i(1+i)^n}{(1+i)^n - 1}\right] \\ &= \left[\frac{0.10(1+0.10)^{10}}{(1+0.10)^{10} - 1}\right] \\ &= 0.16275 \end{aligned}$$

Annualized capital cost = (0.16275) x ($1,409,215) = $229,350

Therefore, as the annual capital cost of the incinerator, $229,350/yr, exceeds the MCET, $33,028, the control technology is not cost effective and not required as BACT.

Option2:

The applicant is proposing option 2, therefore a cost effectiveness analysis is not required.

Step 5 - Select BACT

1. incineration of SWSG contactors exhaust

BACT for SO_x

Step 1 - Identify All Possible Control Technologies

1. Wet Scrubber

   This option is proposed by the applicant and is considered achieved in practice technologically feasible. The listed emissions limit is achievable using a SO_2 scrubber. Based on a manufacturer's engineering estimate, SO_x emissions are not expected to exceed 30 ppmv @ 0%.

   The most stringent limit identified in the review of facilities operating ATS production units was 90 ppmv @ 0% O_2. Though this limit is not for a SWAATS unit, it is cited here as a reference for an emissions control technology and emissions limit transferred from a similar class of source. This limit is from the NCRA chemical production facility in McPherson, KS (formerly McPherson Agricultural Products). A control technology was not identified, but a wet scrubber was assumed, as this the only control technology identified for the any of the other chemical facilities reviewed.

   The proposed SWAATS unit compares favorably to a CLAUS unit with tail gas treating in overall sulfur and H_2S removal efficiencies. Please note that the SWAATS unit is not the same class and category of source as a CLAUS unit. A CLAUS unit produces elemental sulfur whereas a SWAATS unit produces ATS, a liquid fertilizer product.

   The SWAATS unit is not expected to emit H_2S. All H_2S in the SWSG contactors exhaust will be converted to SO_2 in the combustor/catalytic reactor and subsequently reacted to form ATS. The overall sulfur removal efficiency of the SWAATS unit is expected to exceed 99.8%. (BAAQMD Guideline 169.1 for a sulfur recovery plant establishes BACT as ≥95% H_2S conversion efficiency and < 10 ppmv H_2S in the exhaust. These removal efficiencies are achievable with a Claus type sulfur recovery unit with tail gas treating.)

Step 2 - Eliminate Technologically Infeasible Options

The listed control option is feasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. Wet Scrubber (30 ppmv @ 0% O_2 or 95% removal efficiency)

Step 4 - Cost Effectiveness Analysis

As the applicant is proposing the highest ranked control option not eliminated in Step 2, a cost effectiveness analysis is not required.

Step 5 - Select BACT

1. Wet Scrubber (30 ppmv @ 0% O_2 or 95% removal efficiency)

   As the applicant has proposed the highest ranked control option that has been identified for this class and category of source, BACT for SO_x has been satisfied.

BACT for CO

Step 1 - Identify All Possible Control Technologies

1. efficient combustion of SWSG contactors exhaust and incineration of SO_2 scrubber exhaust
   The above listed limit is technologically feasible using a thermal incinerator on the scrubber exhaust, and would reduce both VOC and CO emissions. The applicant's engineering design consultant evaluated an incinerator to achieve 0 ppmv CO @ 0%O_2. Such an incinerator would also be expected to reduce VOC emissions by 99%. The operation of an incinerator would correspondingly result in increased combustion emissions of NO_x and PM_{10}.

2. efficient combustion of SWSG contactors exhaust and use of an oxidation catalyst on SO_2 scrubber exhaust

3. efficient combustion of SWSG contactors exhaust

   The applicant has proposed the above listed control technology. VOC in the SWSG contactor exhaust will be nearly totally oxidized in the combustor/catalytic reactor, primarily to CO_2 but with some CO. The manner of operation of the combustor/catalytic reactor will limit CO emissions to100 ppmv @ O% O_2.

   A review of the permits for facilities operating ATS production units reveals that neither performance based BACT limits nor control technologies have been specified for CO emissions for any unit.

Step 2 - Eliminate Technologically Infeasible Options

2. efficient combustion of SWSG contactors exhaust and use of an oxidation catalyst on SO_2 scrubber exhaust

   The applicant investigated the option of installing an oxidation catalyst to reduce the CO and VOC in the SWAATS scrubber exhaust. Oxidation catalysts typically require exhaust temperatures above 700 °F to be effective. As the exhaust will exit the SWAATS at approximately 130 °F, an oxidation catalyst is not a viable option without increasing the exhaust temperature.

The applicant's engineering design consultant has estimated that, given the availability of process heat, installation of a heat exchanger could raise the exhaust temperature to no higher than 400 °F. The applicant has identified a low temperature oxidation catalyst from Engelhard Corporation that is claimed to be effective at temperatures of about 400 °F. However, Engelhard expressed concern that the projected SO_2 levels could lead to catalyst poisoning and a degradation of performance.

Therefore this option is not considered feasible.

Step 3 - Rank Remaining Control Technologies by Control Effectiveness

1. efficient combustion of SWSG contactors exhaust and incineration of SO_2 scrubber exhaust (0 ppmv 0% O_2)

2. efficient combustion of SWSG contactors exhaust (100 ppmv 0% O_2)

Step 4 - Cost Effectiveness Analysis

Option 1:

For CO, the potential reduction in emissions is calculated below, assuming an incinerator would reduce the CO emissions concentration from approximately 100 (manufacturer's estimate of worst case uncontrolled emissions) to 0 ppmv @ % O_2 and that the exhaust rate from the SWAATS is 8.73 MM Scf/day.

$$\frac{8.73\,MM\ scf}{24\,hr} \times \frac{(100-0)\,scf\ CO}{MM\ Scf} \times \frac{lb \cdot mol}{379.4\,scf} \times \frac{28\,lb}{lb \cdot mol} \times \frac{8760\,hr}{yr} \times \frac{ton}{2{,}000\,lb} = 11.76\frac{tons}{yr}$$

For VOC, the potential reduction in emissions is calculated below, assuming an incinerator would reduce the VOC emissions by 99% from the manufacturer's worst-case emissions rate, 1.36 lb/hr.

$$\frac{1.36\,lb}{hr} \times \frac{0.99}{} \times \frac{8760\,hr}{yr} \times \frac{ton}{2{,}000\,lb} = 5.9\frac{tons}{yr}$$

For emissions control technologies that control more than one pollutant, the Multi-pollutant Cost Effectiveness Threshold (MCET) is calculated and compared to the total annualized cost of the control technology to determine if it required as BACT. The MCET is calculated as follows:

$$\frac{11.76\ tons\ CO}{yr} \times \frac{\$300}{ton} + \frac{5.9\,tons\ VOC}{yr} \times \frac{\$5000}{ton} = \frac{\$33{,}028}{yr}$$

The total capital cost to install a 19 MM Btu/hr incinerator is $1,409,215. Annual operating costs were not considered in this evaluation. The applicant provided a detailed capital cost estimate, which is included as Appendix – SWAATS A.

As calculated below, the equivalent annual cost is $229,350/yr, assuming a useful life of 10 years and discount rate of 10%.

$$Capital\ Recovery\ Factor = \left[\frac{i(1+i)^n}{(1+i)^n - 1}\right]$$

$$= \left[\frac{0.10(1+0.10)^{10}}{(1+0.10)^{10} - 1}\right]$$

$$= 0.16275$$

Annualized capital cost = (0.16275) x ($1,409,215) = $229,350

Therefore, as the annual capital cost of the incinerator, $229,350/yr, exceeds the MCET, $33,028, the control technology is not cost effective and not required as BACT.

Option2:

The applicant is proposing option 2, therefore a cost effectiveness analysis is not required.

Step 5 - Select BACT

1. efficient combustion of SWSG contactors exhaust

Appendix BACT- SWAATS A

Capital Cost Estimate for 19 MM Btu/hr Thermal Incinerator

Project Description: Clean Fuels Project
Client: Big West of California
IAG Projects No. 25601
Location: Bakersfield, California

ROM Estimate
SWAATS Incinerator Cost Avoidance
Incinerator

25-Aug-06

DESCRIPTION	WORK HOURS	ESTIMATED COST LABOR	MATERIAL	S/C	TOTALS
Demo	0	$0	$0	$0	$0
Site Work and Civil	52	$3,700	$900	$0	$4,600
Concrete	479	$34,500	$7,200	$0	$41,700
Structural Steel	110	$7,900	$5,900	$0	$13,800
Buildings	0	$0	$0	$0	$0
Equipment	1,000	$72,000	$750,000	$0	$822,000
Piping	419	$30,200	$7,800	$0	$38,000
Electrical	133	$9,600	$6,300	$0	$15,900
Control Systems	0	$0	$0	$0	$0
Paint and Insulation	300	$21,600	$13,000	$0	$34,600
Support Work	337	$24,200	$0	$0	$24,200
TOTAL DIRECT FIELD COSTS	2,830	$203,700	$791,100	$0	$994,800
Construction Indirect Field Costs (All-in Rate included w/ Directs)					In Rate
TOTAL INDIRECT FIELD COSTS					$0
TOTAL FIELD COSTS					$994,800
CM					$49,740
Engineering Costs					$149,220
TOTAL OFFICE COSTS					$198,960
TOTAL FIELD & OFFICE COSTS					$1,193,760
Sales Tax					Excluded
Fee					Excluded
Freight					$31,644
Escalation					Excluded
Contingency					$183,811
TOTAL					$1,409,215

Appendix F

Interpollutant Offset Analysis

PM10 Interpollutant Offset Ratio Analysis
for Kern County

Annual

PM10

	Notes	Units	Estimate	Uncertainty		
"Vegetative Burning" Total	1	μg/m^3	6.31	2.28		"Annual based on Monthly" speciation worksheet cells G5 and H5
Industry Component (30%)	2	μg/m^3	1.89			"Kern - Bakersfield" worksheet for speciated rollback analysis
Regional Background (20%)	3	μg/m^3	0.38			"
Industry minus Background		μg/m^3	1.51			"
County Contribution	4	μg/m^3	0.76			"
Organic Carbon PM10 Inventory - Kern County	5	ton/day	7.90			" Required to use base year emissions that are related to the observed speciation
County Impact		μg/m^3 per ton	0.10	0.13		
				0.06		
Nitrate						
Ammonium Nitrate	6	μg/m^3	14.9	1.3		Annual based on Monthly, speciation worksheet cells O5 and P5
Regional Background	7	μg/m^3	1.00			"Kern - Bakersfield" worksheet for speciated rollback analysis
Ammonium Nitrate minus Background		μg/m^3	13.90			"
County Contribution	8	μg/m^3	6.95			"
NOx Inventory - Kern County	9	ton/day	156.4546			" Required to use base year emissions that are related to the observed speciation
County Impact		μg/m^3 per ton	0.04	0.05		
				0.04		
Tons of NOx to Equal Effect of 1 ton PM10	10		2.16	2.69	0.54	
				1.51	-0.64	

1. Per SJVUAPCD and CARB, PM10 emissions from stationary industrial combustion sources are included in the Vegetative Burning category from Chemical Mass Balance modeling performed for the SJVUAPCD 2003 PM10 Attainment Plan (Bakersfield - Golden State monitoring station).
2. Per SJVUAPCD, 30% of this category is attributed to stationary industrial combustion sources.
3. Per SJVUAPCD, regional background is estimated to be 20% of net concentration after previous adjustment to Vegetative Burning category.
4. Contribution from sources within Kern County is 50% of net concentration after previous adjustments to Vegetative Burning category.
5. Organic carbon PM10 inventory for Kern County that contributes to this monitoring location; from SIP inventory with updates and adjustments based on CCOS study.
6. Ammonium nitrate category from Chemical Mass Balance modeling performed for the SJVUAPCD 2003 PM10 Attainment Plan (Bakersfield - Golden State monitoring station).
7. Per SJVUAPCD, regional background of ammonium nitrate is estimated to be 1 μg/m^3.
8. Contribution from sources within Kern County is 50% of net concentration after previous adjustment to Vegetative Burning category.
9. NOx inventory for Kern County that contributes to this monitoring location; from SIP inventory with updates and adjustments based on CCOS study.
10. PM10 County Impact divided by Ammonium nitrate County Impact.

Notes for the Kern Interpollutant Analysis

The interpollutant relationship established for Kern County in this analysis would be applicable to any project in the SJVAPCD portion of the County.

Tons of SOx to Equal Effect of 1 Ton of PM10	1.055	See SOxPM10 worksheet for calculations
Tons of NOx to Equal Effect of 1 ton PM10	2.157	See NOxPM10 worksheet for calculations

Input data for the interpollutant worksheets are from the Annual and Annual based on Monthly worksheets
These worksheets are data and analyses submitted for the PM10 SIP
The AOI worksheet provides area of influence evaluations used to analyze specific episodes in the PM10 SIP
Episode evaluations reveal a variety of source areas for different episodes.
This justifies the use of the entire county, and in some cases more than one county, as the source area for annual interpollutant evalaution.

Appendix G

Risk Management Review
Including Ambient Air Quality Analysis

San Joaquin Valley Air Pollution Control District
Risk Management Review

To:	L. Scandura, R. Karrs, D. Torri, AQE – Permit Services		
From:	Joe Aguayo, AQS – Technical Services		
Date:	August 8, 2008		
Facility Name:	Big West of California, LLC		
Location:	Bakersfield		
Project #:	S-1061149	S-1062742	S-1062741
Application #(s):	S-33-407-0 S-33-408-0 S-33-409-0 S-33-410-0 S-33-411-0 S-33-413-0 S-33-415-0 S-33-416-0	S-33-13-18 S-33-67-4 S-33-419-0 S-33-420-0 S-33-423-0 S-33-424-0 S-33-425-0 S-33-426-0	S-3303-1-4

A. RMR SUMMARY

Cumulative risks for the Clean Fuels Project (CFP) were reported for the PMI at which Maximum Individual Cancer Risk was calculated for a residential receptor (Receptor 4176). Risks for individual units are reported for the PMI at which each Hazard Index and Cancer Risk was highest. Receptor numbers are given in parentheses.

CFP Cumulative RMR Summary (Rec. 4176)[1]	
Categories	**Facility Totals**
Prioritization Score	>1
Acute Hazard Index	7.89×10^{-2}
Chronic Hazard Index	1.11×10^{-2}
Maximum Individual Cancer Risk (10^{-6})	3.42

[1]Includes only the risk estimated for new and previously permitted units at facility S-33.

RMR Summary Mild Hydrocracker	
Categories	**Unit 13-18**
Acute Hazard Index	7.41×10^{-4} (4140)
Chronic Hazard Index	5.05×10^{-4} (4176)
Maximum Individual Cancer Risk (10^{-6})	0.09 (4176)
T-BACT Required?	**No**
Special Permit Conditions?	**No**

RMR Summary for Tank 30M02	
Categories	**Unit 67-4**
Acute Hazard Index	1.24×10^{-5} (4144)
Chronic Hazard Index	2.07×10^{-5} (4144)
Maximum Individual Cancer Risk (10^{-6})	0.01 (4144)
T-BACT Required?	**No**
Special Permit Conditions?	**No**

RMR Summary for Hydrogen Plant (HGU2)	
Categories	**Unit 407-0**
Acute Hazard Index	1.49×10^{-3} (4144)
Chronic Hazard Index	1.05×10^{-3} (4144)
Maximum Individual Cancer Risk (10^{-6})	0.44 (4144)
T-BACT Required?	**No**
Special Permit Conditions?	**No**

RMR Summary for Vacuum Gas Oil Hydro-De-Sulfurization Unit (VGO-HDS)	
Categories	**Unit 408-0**
Acute Hazard Index	6.60×10^{-2} (4144)
Chronic Hazard Index	6.34×10^{-3} (4140 and 4176)
Maximum Individual Cancer Risk (10^{-6})	0.09 (4176)
T-BACT Required?	**No**
Special Permit Conditions?	**No**

RMR Summary for Sour Water Ammonia to Ammonium Thiosulfate Unit (SWAATS)	
Categories	**Unit 409-0**
Acute Hazard Index	3.40×10^{-3} (4144)
Chronic Hazard Index	7.50×10^{-4} (4144)
Maximum Individual Cancer Risk (10^{-6})	0.13 (4144)
T-BACT Required?	**No**
Special Permit Conditions?	**No**

RMR Summary for Fluid Catalytic Cracking Unit (FCCU)	
Categories	**Unit 410-0**
Acute Hazard Index	3.09×10^{-3} (4144)
Chronic Hazard Index	9.98×10^{-4} (4144)
Maximum Individual Cancer Risk (10^{-6})	0.21 (4176)
T-BACT Required?	**No**
Special Permit Conditions?	**No**

RMR Summary for LPG Merox Treating Unit	
Categories	**Unit 411-0**
Acute Hazard Index	8.94×10^{-4} (4140)
Chronic Hazard Index	8.16×10^{-4} (4176)
Maximum Individual Cancer Risk (10^{-6})	0.24 (4176)
T-BACT Required?	**No**
Special Permit Conditions?	**No**

RMR Summary for Ground Flare	
Categories	**Unit 413-0**
Acute Hazard Index	1.92e-2 (4144)
Chronic Hazard Index	3.33e-4 (4140 and 4176)
Maximum Individual Cancer Risk (10^{-6})	0.26 (4140)
T-BACT Required?	**No**
Special Permit Conditions?	**No**

RMR Summary for General Cooling Tower	
Categories	**Unit 415-0**
Acute Hazard Index	7.77×10^{-5} (4176)
Chronic Hazard Index	4.90×10^{-5} (4176)
Maximum Individual Cancer Risk (10^{-6})	0.10 (4176)
T-BACT Required?	**No**
Special Permit Conditions?	**No**

RMR Summary for Alkylation Unit Cooling Tower	
Categories	**Unit 416-0**
Acute Hazard Index	5.35×10^{-5} (4144)
Chronic Hazard Index	8.17×10^{-5} (4176)
Maximum Individual Cancer Risk (10^{-6})	0.17 (4176)
T-BACT Required?	**No**
Special Permit Conditions?	**No**

RMR Summary for Emergency Diesel IC Engines	
Categories	**Units 419-0, 420-0 and 429-0**
Acute Hazard Index	0.0
Chronic Hazard Index	3.36×10^{-4} (4144)
Maximum Individual Cancer Risk (10^{-6})	0.70 (4144)
T-BACT Required?	**No**
Special Permit Conditions?	**No**

RMR Summary for 80K bbl Gasoline Tank	
Categories	**Unit 423-0**
Acute Hazard Index	4.49×10^{-5} (4144)
Chronic Hazard Index	5.57×10^{-5} (4144)
Maximum Individual Cancer Risk (10^{-6})	0.06 (4144)
T-BACT Required?	**No**
Special Permit Conditions?	**No**

RMR Summary Process Water Tank	
Categories	**Unit 424-0**
Acute Hazard Index	$9.88e^{-5}$ (4176)
Chronic Hazard Index	$3.36e^{-5}$ (4176)
Maximum Individual Cancer Risk (10^{-6})	0.03 (4176)
T-BACT Required?	**No**
Special Permit Conditions?	**No**

RMR Summary for Tank 20M01	
Categories	**Unit 425-0**
Acute Hazard Index	8.40×10^{-6} (4144)
Chronic Hazard Index	1.51×10^{-5} (4144)
Maximum Individual Cancer Risk (10^{-6})	0.01 (4144)
T-BACT Required?	**No**
Special Permit Conditions?	**No**

RMR Summary for Tank 20M02	
Categories	**Unit 426-0**
Acute Hazard Index	9.80×10^{-6} (4144)
Chronic Hazard Index	1.57×10^{-5} (4144)
Maximum Individual Cancer Risk (10^{-6})	0.01 (4144)
T-BACT Required?	**No**
Special Permit Conditions?	**No**

RMR Summary for Sales Terminal Loading Rack	
Categories	**Unit S-3303-1-4**
Acute Hazard Index	5.91×10^{-5} (4144)
Chronic Hazard Index	5.49×10^{-5} (4144)
Maximum Individual Cancer Risk (10^{-6})	0.05 (4144)
T-BACT Required?	**No**
Special Permit Conditions?	**No**

Proposed Permit Conditions

To ensure that human health risks will not exceed District allowable levels; the following permit conditions must be included for:

All Units

No special conditions are required.

B. RMR REPORT

I. Project Description

Technical Services received a request in April 2006, to perform an Ambient Air Quality Analysis and a Risk Management Review for a proposed installation of: a 24,000 BPSD Vacuum Gas Oil Hydro-De-Sulfurization Unit, a 25,000 BPSD Fluid Catalytic Cracking Unit, a Sour Water Stripper, an 11,000 BPSD LPG Merox Treating Unit, a 11,000 BPSD Alkylation Unit a 28 MMSCFD Hydrogen Unit, a ATS unit to handle ammonia and sulfur removal, a low pressure Alky Unit Flare and a high pressure Ground Flare, a cooling tower for the alkylation unit, a cooling tower for the remaining cooling water needs, three (3) diesel fire pumps, and five (5) Storage Tanks. Included in this Risk Management Review are modifications to the following existing units: A Mild Hydrocracker, a Truck Loading Operation, and a Sales Terminal Loading Rack at S-3303. The RMR was completed in July 2006.

In December of 2006, Technical Services received revised Health Risk and Ambient Air Quality analyses from the Ashworth Leininger Group for the above project. This memorandum is a review of the risks estimated for those revised analyses. Changes to the project include the removal of the following emission sources: a low pressure Alkyl Unit Flare, a Steam Boiler, and 1 Diesel Fire Pump. The locations of the following units were also changed: The ATS unit, the General Cooling Tower, the HF Alkyl Cooling Tower, and the remaining 3 Diesel Fire Pumps.

In August 2008, the RMR was revised to include the results of modeling using AERMOD.

II. Analysis

Technical Services did not perform a prioritization using the District's HEARTs database. Since the previous total facility prioritization score was greater than one, a refined health risk assessment was required. Emissions calculated by Ashworth Leininger Group (see attachment) were input into the HARP model. In addition to the new and modified units in the Clean Fuels Project, all previously permitted and constructed new and modified units (since 1996) were modeled to determine cumulative impacts. The HARP dispersion module was used, with the attached source parameters and meteorological data for 2000 from Bakersfield to determine the maximum dispersion factors at the nearest residential, business and other sensitive receptors. These dispersion factors were input to the HARP risk module to calculate the chronic and acute hazard indices and the carcinogenic risk for the project.

Technical Services also performed an Ambient Air Quality Analysis (AAQA) for the following criteria pollutants: CO, NOx, SOx and PM_{10}. The emission rates used for criteria pollutant modeling are shown below:

Emissions Rates

		NOx g/s	SOx g/s	CO g/s	PM10g/s
VGOHTR		0.1438	0.0333	0.2189	0.0441
VGOFRHTR		0.1071	0.0248	0.1630	0.0329
H2REFORM		0.4904	0.4545	0.5971	0.6018
FCCUREG	Short	1.0604	1.4765	1.9046	1.1647
	Ann	2.1208	3.6913	16.1407	1.1647
MHC14H12		0.3748	0.0638	1.4904	0.0845
HFREBOIL		0.1645	0.1525	0.2003	0.2018
SWAATS		0.0000	0.2322	4.3994	0.0000
COOLT1		0.0000	0.0000	0.0000	0.0303
COOLT2		0.0000	0.0000	0.0000	0.0303
GNDFLARE	1hr	3.2444	12.5887	17.6532	N/A
	3hr	3.2444	4.1977	N/A	N/A
	8hr	2.4397	1.5755	13.2748	N/A
	24hr	0.8304	0.5266	N/A	0.3175
	Ann	0.0279	0.0057	N/A	0.0107
FIREPUMP	1hr	1.9425	0.0022	1.1375	N/A
	3hr	0.6475	0.0007	N/A	N/A
	8hr	0.2428	0.0003	0.1422	N/A
	24hr	0.0809	0.0001	N/A	0.0027
	Ann	0.0222	0.00002	N/A	0.0007
EMRFLARE		15.88	-	86.39	-

Results of the AAQA are as follows:

Criteria Pollutant Modeling Results*
Values are in $\mu g/m^3$

Pollutant	Avg Per	Max Imp.	Back Conc.	Total Conc.	CAAQS	NAAQS	Significance Impact Level
NOx	1h	195.42	138.95	334.37	470	N/A	-
	Ann	0.96	33.80	34.76	N/A	100	-
CO	1h	122.19	3,772.8	3894.99	23,000	40,000	-
	8h	32.90	2,515.4	2548.30	10,000	10,000	-
SOx	1h	86.11	78.44	164.55	655	N/A	-
	3h	86.11	39.22	125.33	N/A	1300	-
	24h	1.86	13.07	14.93	105	365	-
	Ann	0.42	5.23	5.65	N/A	80	-
PM10	24h	1.18[1]	Non attainment	1.18	-	-	5
	Ann	0.44[1]	Non attainment	0.44	-	-	1

[1]The criteria pollutants are below EPA's level of significance as found in 40 CFR Part 51.165 (b)(2).

III. Conclusion

The acute and chronic indices are below 1.0, the cancer risk for the Clean Fuels Project is less than 1.0 in a million, and the cumulative cancer risk is less than 10 in a million. **In accordance with the District's Risk Management Policy, the project is approved without Toxic Best Available Control Technology (T-BACT).**

These conclusions are based on the data provided by the applicant and the project engineer. Therefore, this analysis is valid only as long as the proposed data and parameters do not change.

The emissions from the proposed equipment will not cause or contribute significantly to a violation of the State and National AAQS.

Based on the changes in the August 2008 analyses, overall risk for this project went down with respect to risk estimated using the April 2006 analyses and December 2006.

Appendix H

Compliance Certification

BIG WEST OF CALIFORNIA, LLC
A FLYING J Company
6451 Rosedale Highway • Bakersfield, CA 93308 • Phone 661.326.4200 • www.flyingj.com

September 7, 2006

RECEIVED
SEP 08 2006
SJVAPCD
Southern Region

Mr. Tom Goff
San Joaquin Valley Air Pollution Control District
Southern Region
2700 "M" Street, Suite 275
Bakersfield, CA 93301-2370

Re: Big West of California, LLC – Clean Fuels Project – Compliance Certification

Dear Mr. Goff:

In response to the District's request, I am providing this certification of compliance, as required by District Rule 2201, Section 4.15.2, to allow the District to determine that the permit applications associated the Big West of California, LLC Clean Fuels Project are complete. On behalf of Big West of California, LLC, I hereby certify, under penalty of perjury, the following:

- I am authorized to make this certification on behalf of Big West of California, LLC.
- This certification is made pursuant to District Rule 2201, Section 4.15.2.
- To the best of my knowledge, at 12:01 am on September 7, 2006 all major stationary sources owned or operated by Big West of California, LLC in the State of California were either in compliance or on a schedule of compliance with all applicable state and federal air quality emission limitations or standards.

Each of the statements made in this letter is made in good faith. Accordingly, it is Big West of California LLC's understanding in submitting this certification that the District shall take no action against Big West of California LLC or any of its employees based on any statement made in this certification.

Signed:
Name: Gene Cotten, Refinery Manager
Dated: 9/7/06
Time: 5:00 AM/PM

Thank you very much for your continued assistance in Big West of California's Clean Fuels Project. Please call Mr. Bill Chadick (661.326.4412) should you have any additional questions on this matter.

Very truly yours,

Gene Cotten
Vice President Refining
Refinery Manager
Big West of California, LLC

cc: Mr. Bill Chadick

Appendix I

Draft Authority to Construct

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

PERMIT NO: S-33-407-0 **ISSUANCE DATE:** DRAFT

LEGAL OWNER OR OPERATOR: BIG WEST OF CA, LLC
MAILING ADDRESS: 6451 ROSEDALE HWY (AREA 1 & 2)
BAKERSFIELD, CA 93308

LOCATION: 6451 ROSEDALE HWY (AREA 1 & 2)
BAKERSFIELD, CA 93308

EQUIPMENT DESCRIPTION:
HYDROGEN GENERATION UNIT (HGU2) WITH STEAM METHANE REFORMER (SMR) FURNACE HAVING A HEAT INPUT RATING NOT EXCEEDING 641 MM BTU/HR AND EQUIPPED WITH MULTIPLE CALLIDUS MODEL CFRG-4 BURNERS OR EQUIVALENT AND SELECTIVE CATALYTIC REDUCTION (SCR)

CONDITIONS

1. {1829} The facility shall submit an application to modify the Title V permit in accordance with the timeframes and procedures of District Rule 2520. [District Rule 2520] Federally Enforceable Through Title V Permit
2. {1830} This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District NSR Rule] Federally Enforceable Through Title V Permit
3. Permittee shall submit to the District final design details for the burners, SCR emissions control system and continuous emission monitors required for this unit, at least 30 days prior to initiation of construction on this unit. [District Rule 2201] Federally Enforceable Through Title V Permit
4. Permittee shall obtain APCO approval for the use of any equivalent low-NOx burner not specifically approved by this ATC document prior to installation. Approval of any equivalent low-NOx burner shall be made by the APCO's determination that the submitted design and performance data for alternate burner are equivalent to an approved burner. [District Rule 2201] Federally Enforceable Through Title V Permit
5. Permittee's request for approval of an equivalent low-NOx burner shall include at minimum the following information: burner manufacturer and model number, maximum heat input rating, manufacturer's performance and design specifications, manufacturer's burner drawings, and description of low-NOx operation. [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 326-6900 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director / APCO

DRAFT

DAVID WARNER, Director of Permit Services

S-33-407-0 : Sep 3 2008 9:03AM -- KARRSR : Joint Inspection Required with KARRSR

6. At least 30 days prior to initial startup of this unit, the operator shall provide and have approved by the District a startup/shutdown plan. This plan shall list and describe the procedures required to complete the startup and shutdown of this unit, the required time for each procedure and the measures to be taken to minimize emissions during these periods. At a minimum the plan shall shall address the following: preparation; warm-up of the high temperature shift converter; light-off, warm-up, and refractory drying-out of the furnace; and introduction of feed into the unit. [District Rule 2201] Federally Enforceable Through Title V Permit

7. Ammonia injection grid shall be equipped with operational ammonia flowmeter and injection pressure indicator. [District Rule 2201] Federally Enforceable Through Title V Permit

8. Permittee shall monitor and record exhaust gas temperature at selective catalytic reduction catalyst inlet. [District Rule 2201] Federally Enforceable Through Title V Permit

9. Total sulfur content of fuel combusted in this unit shall not exceed 40 ppmv (measured as H2S), based on a 4-hr rolling average . [District Rule 2201] Federally Enforceable Through Title V Permit

10. The duration of each startup period for this unit shall not exceed 12 hours. The duration of each shutdown period for this unit shall not exceed 9 hours. [District Rules 2201, 4305 and 4306] Federally Enforceable Through Title V Permit

11. During each startup and shutdown, the emission control systems shall be in operation and emissions shall be minimized insofar as is technologically feasible. [District Rules 2201, 4305 and 4306] Federally Enforceable Through Title V Permit

12. The permittee shall maintain records of the duration of each startup and shutdown period for this unit. [District Rules 2201, 4305 and 4306] Federally Enforceable Through Title V Permit

13. Except during startup and shutdown periods, emission rates shall not exceed any of the following: NOx (as NO2): 5 ppmv @ 3% O2 (15 minute average basis), PM10: 0.0076 lb/MMBtu, CO: 10 ppmv @ 3% O2 (3 hour average basis) and 400 ppmv @ 3% O2 (15 minute average basis), VOC: 0.0054 lb/MMBtu or ammonia slip: 10 ppmv @ 3% O2 (3 hour rolling average basis). [District Rules 2201, 4305, 4306 and 4351] Federally Enforceable Through Title V Permit

14. Emission rates shall not exceed any of the following: NOx (as NO2): 93.4 lb/day, SOx (as SO2): 86.2 lb/day, PM10: 114.6 lb/day, CO: 113.7 lb/day, VOC: 83.1 lb/day (non-fugitive) and ammonia: 69.2 lb/day. [District Rule 2201] Federally Enforceable Through Title V Permit

15. Fugitive VOC emissions from components associated with this unit shall not exceed 15.3 lb/day. [District Rule 2201] Federally Enforceable Through Title V Permit

16. Prior to operating equipment under this Authority to Construct, permittee shall surrender emission reduction credits to offset the calendar quarter emissions increases set forth below, at the distance offset ratio specified in Rule 2201 (as amended 12/15/05) Table 4.2 and the interpollutant offset ratio specified in this permit, NOx (as NO2) - Q1: 8,523 lb, Q2: 8,523 lb, Q3: 8,523 lb, and Q4: 8,523 lb; SOx (as SO2) - Q1: 7,866 lb, Q2: 7,866 lb, Q3: 7,866 lb and Q4: 7,866 lb; PM10 - Q1: 10,457 lb, Q2: 10,457 lb, Q3: 10,457 lb and Q4: 10,457 lb; CO - Q1: 10,375 lb, Q2: 10,375 lb, Q3: 10,375 lb and Q4: 10,375 lb, and VOC - Q1: 8,979 lb, Q2: 8,979 lb, Q3: 8,979 lb and Q4: 8,979 lb. [District Rule 2201] Federally Enforceable Through Title V Permit

17. ERC Certificate Number S-2183-2 (or certificates split from this certificate) shall be used to supply the required NOx and PM10 offsets, ERC Certificate Number S-2178-3 (or a certificate split from this certificate) shall be used to supply the required CO offsets, ERC Certificate Number S-2452-1 (or a certificate split from this certificate) shall be used to supply the required VOC offsets and ERC Certificate Numbers S-2177-5 and/or S-2184-5 (or certificates split from these certificates) shall be used to supply the required SOx, unless a revised offsetting proposal is received and approved by the District, upon which this Authority to Construct shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of this Authority to Construct. [District Rule 2201]

18. NOx ERCs may be used to offset PM10 emission increases at a ratio of 2.16 lb NOx : 1 lb PM10. [District Rule 2201] Federally Enforceable Through Title V Permit

19. At least once per week for an initial period of six weeks, and thereafter, at least once every six months, permittee shall obtain and analyze a representative sample for total reduced sulfur of the fuel combusted in this unit. Samples shall be analysed using ASTM Test Method D6228-98, D4468-85 or D1072-06, or an alternative analytical method approved in advance by the APCO. [District Rule 2201] Federally Enforceable Through Title V Permit

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20. This unit shall be equipped with a continuous monitoring system to measure and record fuel consumption. [District Rules 2201 and 4001] Federally Enforceable Through Title V Permit

21. Exhaust duct downstream of the SCR unit shall be equipped with continuously recording emissions monitors (CEMS) for NOx and O2. All CEMS shall be dedicated to this unit. CEMS shall meet the requirements of 40 CFR Part 60. [District Rule 1080] Federally Enforceable Through Title V Permit

22. The facility shall install and maintain equipment, facilities, and systems compatible with the District's CEM data polling software system and shall make CEM data available to the District's automated polling system on a daily basis. [District Rule 1080]

23. Upon notice by the District that the facility's CEM system is not providing polling data, the facility may continue to operate without providing automated data for a maximum of 30 days per calendar year provided the CEM data is sent to the District by a District-approved alternative method. [District Rule 1080] Federally Enforceable Through Title V Permit

24. The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NOx, CO, and O2 analyzer during District inspections. The sampling ports shall be located in accordance with the CARB regulation titled California Air Resources Board Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing. [District Rule 1081] Federally Enforceable Through Title V Permit

25. The permittee shall monitor and record the stack concentration of CO at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last month. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

26. If the CO concentrations corrected to 3% O2, as measured by the portable analyzer, exceed the allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 1 hour of operation after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 1 hour of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

27. All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

28. The permittee shall maintain records of: (1) the date and time of CO measurements, (2) the O2 concentration in percent and the measured CO concentrations corrected to 3% O2, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

29. The permittee shall demonstrate continuous compliance with the sulfur content limit of the fuel combusted in this unit by calculation, as the product of the fuel H2S concentration and the ratio of total sulfur to H2S, based on the most recently conducted fuel sample analysis for total sulfur. The total sulfur of the fuel shall be calculated for each one hour H2S monitoring result, and the hourly fuel sulfur values shall be averaged over a rolling three hour period to determine compliance. [District Rule 2201] Federally Enforceable Through Title V Permit

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30. Within 90 days of commencement of normal, continuous operation of this unit, operator shall inspect all components for leaks using a portable hydrocarbon detection instrument and the methods specified in Section 6.4.1 of Rule 4455, except for those components that are specifically exempted from the requirements of Rule 4455. [District Rule 2201] Federally Enforceable Through Title V Permit

31. Operator shall demonstrate compliance with fugitive VOC emissions limit of this permit within 60 days after the completion of the initial inspection of components and annually thereafter within 60 days after completion of the annual inspection of components required by Rule 4455. Compliance shall be demonstrated by calculation, using the correlation equations, zero default and 10,000 ppmv pegged factors set forth in the CAPCOA California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities, Table IV-3a, February 1999, and the average emission concentrations of total organic compounds measured for each component during all inspections conducted during the prior 365 day period. [District Rule 2201] Federally Enforceable Through Title V Permit

32. The permittee shall monitor and record the stack concentration of ammonia (NH3) at least once during each month in which a source test is not performed. NH3 monitoring shall be conducted utilizing Draeger tubes or a District approved equivalent method. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within one day of restarting the unit unless monitoring has been performed within the last month. [District Rule 4102] Federally Enforceable Through Title V Permit

33. The permittee shall maintain records of: (1) the date and time of ammonia (NH3) measurements, (2) the O2 concentration in percent by volume and the measured NH3 concentrations corrected to 3% O2, (3) the method of determining the NH3 emission concentration, and (4) a description of any corrective action taken to maintain the emissions at or below the acceptable levels. [District Rule 4102] Federally Enforceable Through Title V Permit

34. Compliance with NOx, CO, PM, VOC and ammonia slip emission limits shall be demonstrated within 120 days of initial operation. Compliance with NOx, CO and ammonia slip emission limits shall be demonstrated once every twelve months thereafter. Compliance demonstration shall be by District authorized in situ sampling of heater vent exhaust gases by a qualified independent source test firm at conditions representative of normal operation. [District Rules 2201, 4102, 4305, 4306 and 4351] Federally Enforceable Through Title V Permit

35. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified 30 days prior to any compliance source test, and a source test plan must be submitted for approval 15 days prior to testing. [District Rule 1081] Federally Enforceable Through Title V Permit

36. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081] Federally Enforceable Through Title V Permit

37. The following test methods shall be used: NOx EPA Method 7E or ARB Method 100; CO EPA method 10, 10B or ARB Method 100; O2 EPA Method 3, 3A or ARB Method 100; VOC EPA method 18 or 25; PM10 EPA Method 5 (front and back half) or EPA Methods 201A and 202, and ammonia BAAQMD ST-1B. EPA approved alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rules 1081, 2201, 4305, 4306 and 4351] Federally Enforceable Through Title V Permit

38. Compliance demonstration shall be based on the arithmetic mean, pursuant to District Rule 1081(amended December 16, 1993), of 3 thirty-minute test runs for NOx and CO. [District Rule 2520, 9.3.2] Federally Enforceable Through Title V Permit

39. All required source testing shall conform to the compliance testing procedures described in District Rule 1081(Last Amended December 19, 1993). [District Rule 1081, and Kern County Rule 108.1] Federally Enforceable Through Title V Permit

40. {588} Particulate matter emissions shall not exceed 0.1 grain/dscf, 0.1 grain/dscf calculated to 12% CO2, nor 10 lb/hr. [District Rules 4201, 3.1 and 4301, 5.1 and 5.2.3] Federally Enforceable Through Title V Permit

41. Emissions of sulfur compounds from this unit shall not exceed 200 lb per hour, calculated as SO2. Compliance with this requirement shall be demonstrated by multiplying the sulfur content (ppmv, as total reduced sulfur) by the hourly volumetric fuel flow (scf/hr) to this unit, and converting to SO2. [District Rule 2520, 9.3.2 and District Rule 4301, 5.2.1] Federally Enforceable Through Title V Permit

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42. If fuel analysis is used to demonstrate compliance with the conditions of this permit, the fuel higher heating value for each fuel shall be certified by third party fuel supplier or determined by: ASTM D 1826 or D 1945 in conjunction with ASTM D 3588 for gaseous fuels. [District Rule 2520, 9.3.2; 4305, 6.2.1; and 4351, 6.2.1] Federally Enforceable Through Title V Permit

43. The concentration of sulfur compounds in the exhaust from this unit shall not exceed 0.2% by volume as measured on a dry basis over a 15 minute period (Kern County Rule 407). To demonstrate compliance with this requirement the operator shall test the sulfur content of each fuel source and demonstrate the sulfur content does not exceed 3.3% by weight for gaseous fuels; or determine that the concentration of sulfur compounds in the exhaust does not exceed the concentration limit by a combination of source testing and fuel analysis. [District Rule 4801 and Kern County Rule 407] Federally Enforceable Through Title V Permit

44. Nitrogen oxide (NOx) emissions shall not exceed 140 lb/hr, calculated as NO2. [District Rules 4301, 5.2.2] Federally Enforceable Through Title V Permit

45. Operators shall not depressurize any vessel containing VOCs unless the process unit turnaround is accomplished by employing one of the following operating procedures: The organic vapors shall either be recovered, added to the refinery fuel gas system and combusted; or controlled and piped to an appropriate firebox or incinerated for combustion; or flared, until the pressure within the process vessel is as close to atmospheric pressure as is possible. All process vessels shall be depressurized into the control facilities to less than 1020 mm Hg (5 psig) before venting/opening to atmosphere. All organic compounds which emerge from a refinery process vessel during the purging of said vessel and which otherwise would be emitted to the atmosphere shall be either directed to a flare or incinerator or shall be used for fuel until such disposition of emissions is not technically feasible or is less safe than atmospheric venting. [District Rule 4454, 4.0] Federally Enforceable Through Title V Permit

46. The operator shall not burn in any fuel gas combustion device any fuel that contains hydrogen sulfide (H2S) in excess of 162 ppmv determined hourly on a 3 hour rolling average basis and H2S in excess of 60 ppmv determined daily on a 365 successive calendar day rolling average basis. [40 CFR 60.102a(g)(1)(ii)] Federally Enforceable Through Title V Permit

47. A continuous emissions monitoring system for fuel gas H2S shall be installed, calibrated, operated, and reported according to EPA guidelines as specified under 40 CFR 60.107a(a)(2). CEM results shall be calculated on a rolling three (3) hour basis. [40 CFR 60, 60.107a(a)(2)] Federally Enforceable Through Title V Permit

48. Operator shall report all rolling 3-hour periods during which the average concentration of H2S as measured by the H2S continuous monitoring system exceeds 162 ppmv and all rolling 365-day periods during which the average concentration of H2S as measured by the H2S continuous monitoring system exceeds 60 ppmv. [40 CFR 60.107a(f)] Federally Enforceable Through Title V Permit

49. Operator shall determine compliance with the H2S standard using EPA Methods 11, 15, 15A, or 16. [40 CFR 60.104a(j)] Federally Enforceable Through Title V Permit

50. Operator shall conduct a root cause analysis of any emission limit exceedance or process start-up, shutdown, upset, or malfunction that causes a discharge to the atmosphere in excess of 500 lb/day of SO2. For any root cause analysis performed, the owner or operator shall record the identification of the affected facility, the date and duration of the discharge, the results of the root cause analysis, and the action taken as a result of the root cause analysis. [40 CFR 60.103a(b)] Federally Enforceable Through Title V Permit

51. The owner or operator shall comply with the requirements 40 CFR 60.482-1 to 40 CFR 60.482-10 as soon as practical, but no later than 180 days after initial start. [40 CFR 60.592(a)] Federally Enforceable Through Title V Permit

52. Each pump in light liquid service (PLLS) shall be monitored monthly to detect leaks by the methods specified in 40 CFR 60.485(b), except as provided in 40 CFR 60.482-1(c) and 40 CFR 60.482-2(d), (e), and (f). Each pump in light liquid service shall be checked by visual inspection each calendar week for indications of liquids dripping from the pump seal. A leak is detected if an instrument reading of 10,000 ppm or greater is measured or if there are indications of liquids dripping from the pump seal. [40 CFR 60.482-2(a) and (b)] Federally Enforceable Through Title V Permit

53. When a leak is detected for each PLLS, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in 40 CFR 60.482-9. A first attempt at repair shall be made no later than 5 calendar days after each leak is detected. [40 CFR 60.482-2(c)] Federally Enforceable Through Title V Permit

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54. Each PLLS equipped with a dual mechanical seal system that includes a barrier fluid system is exempt from the requirements of 40 CFR 60.482-2(a) provided the requirements specified in 40 CFR 60.482-2(d)(1) through (6) are met. [40 CFR 60.482(d)] Federally Enforceable Through Title V Permit

55. Any PLLS that is designated, as described in 40 CFR 60.486(e)(1) and (2), for no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, is exempt from the requirements of 40 CFR 60.482-2(a), (c), and (d) if the pump meets the requirements specified in 40 CFR 60.482-2(e)(1), (2), and (3). [40 CFR 60.482-2(e)] Federally Enforceable Through Title V Permit

56. If any PLLS is equipped with a closed vent system capable of capturing and transporting leakage from the seal or seals to a control device that complies with the requirements of 40 CFR 60.482-10, it is exempt from the requirements of 40 CFR 60.482-2(a) through (e). [40 CFR 60.482-2(f)] Federally Enforceable Through Title V Permit

57. Any pump in PLLS that is designated, as described in 40 CFR 60.486(f)(1), as an unsafe-to-monitor pump is exempt from the monitoring and inspection requirements of 40 CFR 60.482-2(a) and 40 CFR 60.482-2(d)(4) through (6) if: 1). The owner or operator of the pump demonstrates that the pump is unsafe-to-monitor because monitoring personnel would be exposed to an immediate danger as a consequence of complying with 40 CFR 60.482-2(a); and 2) The owner or operator of the pump has a written plan that requires monitoring of the pump as frequently as practicable during safe-to-monitor times but not more frequently than the periodic monitoring schedule otherwise applicable, and repair of the equipment according to the procedures in 40 CFR 60.482-2(c) if a leak is detected. [40 CFR 60.482-2(g)] Federally Enforceable Through Title V Permit

58. Pressure relief devices shall be vented to refinery flare gas recovery system. [40 CFR 60.482-4(c)] Federally Enforceable Through Title V Permit

59. Except for in-situ sampling systems and sampling systems without purges, each sampling connection system shall be equipped with a closed-purge, closed-loop, or closed-vent system, except as provided in 40 CFR 60.482-1(c). Each closed-purge, closed-loop, or closed-vent system shall comply with the requirements specified in 40 CFR 60.482-5(b)(1), (2), (3), and (4). [40 CFR 60.482-5(a), (b), and (c)] Federally Enforceable Through Title V Permit

60. Each open-ended valve or line shall be equipped with a cap, blind flange, plug, or a second valve, except as provided in 40 CFR 60.482-1(c). The cap, blind flange, plug, or second valve shall seal the open end at all times except during operations requiring process fluid flow through the open-ended valve or line. When a double block-and-bleed system is being used, the bleed valve or line may remain open during operations that require venting the line between the block valves but shall comply with this condition at all other times. [40 CFR 60.482-6(a) and (c)] Federally Enforceable Through Title V Permit

61. Each open-ended valve or line equipped with a second valve shall be operated in a manner such that the valve on the process fluid end is closed before the second valve is closed. [40 CFR 60.482-6(b)] Federally Enforceable Through Title V Permit

62. Each valve in gas/vapor service and in light liquid service shall be monitored monthly to detect leaks by the methods specified in 40 CFR 60.485(b) and shall comply with 40 CFR 60.482-7(b) through (e), except as provided in 40 CFR 60.482-7(f), (g), and (h), 40 CFR 60.483-1, 40 CFR 60.483-2, and 40 CFR 60.482-1(c). A leak is detected if an instrument reading of 10,000 ppm or greater is measured. [40 CFR 60.482-7(a) and (b)] Federally Enforceable Through Title V Permit

63. Any valve in gas/vapor service or in light liquid service for which a leak is not detected for 2 successive months may be monitored the first month of every quarter, beginning with the next quarter, until a leak is detected. If a leak is detected, the valve shall be monitored monthly until a leak is not detected for 2 successive months. [40 CFR 60.482-7(c)] Federally Enforceable Through Title V Permit

64. When a leak is detected for any valve in gas/vapor service or in light liquid service, it shall be repaired as soon as practicable, but no later than 15 calendar days after the leak is detected, except as provided in 40 CFR 60.482-9. A first attempt at repair shall be made no later than 5 calendar days after each leak is detected. First attempts at repair include, but are not limited to, the best practices specified in 40 CFR 60.482-7(e)(1), (2), (3), and (4), where practicable. [40 CFR 60.482-7(d) and (e)] Federally Enforceable Through Title V Permit

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65. If evidence of a potential leak is found by visual, audible, olfactory, or any other detection method at pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and connectors, the owner or operator shall follow either one of the following procedures: 1) The owner or operator shall monitor the equipment within 5 days by the method specified in 40 CFR 60.485(b) and shall comply with the requirements of 40 CFR 60.482-8(b) through (d); or 2) The owner or operator shall eliminate the visual, audible, olfactory, or other indication of a potential leak. A leak is detected if an instrument reading of 10,000 ppm or greater is measured. [40 CFR 60.482-8(a) and (b)] Federally Enforceable Through Title V Permit

66. When a leak is detected in pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and connectors, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in 40 CFR 60.482-9. The first attempt at repair shall be made no later than 5 calendar days after each leak is detected. First attempts at repair include, but are not limited to, the best practices described under 40 CFR 60.482-7(e). [40 CFR 60.482-8(c) and (d)] Federally Enforceable Through Title V Permit

67. Except as provided in 40 CFR 60.482-10(i) through (k), each closed vent system used to comply with the provisions of Subpart GGG shall be inspected according to the procedures and schedule specified in 40 CFR 60.482-10(f)(1) and (f)(2). Leaks, as indicated by an instrument reading greater than 500 parts per million by volume above background or by visual inspections, shall be repaired as soon as practicable except as provided in 40 CFR 60.482-10(h). A first attempt at repair shall be made no later than 5 calendar days after the leak is detected. Repair shall be completed no later than 15 calendar days after the leak is detected. [40 CFR 60.482-10(f) and (g)] Federally Enforceable Through Title V Permit

68. Delay of repair of a closed vent system for which leaks have been detected is allowed if the repair is technically infeasible without a process unit shutdown or if the owner or operator determines that emissions resulting from immediate repair would be greater than the fugitive emissions likely to result from delay of repair. Repair of such equipment shall be complete by the end of the next process unit shutdown. [40 CFR 60.482-10(h)] Federally Enforceable Through Title V Permit

69. The owner or operator shall record the following information: 1) Identification of all parts of the closed vent system that are designated as unsafe to inspect, an explanation of why the equipment is unsafe to inspect, and the plan for inspecting the equipment; 2) Identification of all parts of the closed vent system that are designated as difficult to inspect, an explanation of why the equipment is difficult to inspect, and the plan for inspecting the equipment; 3) For each inspection during which a leak is detected, a record of the information specified in 40 CFR 60.486(c); 4) For each inspection conducted in accordance with 40 CFR 60.485(b) during which no leaks are detected, a record that the inspection was performed, the date of the inspection, and a statement that no leaks were detected; and 5) For each visual inspection conducted in accordance with 40 CFR 60.482-10(f)(1)(ii) during which no leaks are detected, a record that the inspection was performed, the date of the inspection, and a statement that no leaks were detected. [40 CFR 60.482-10(l)] Federally Enforceable Through Title V Permit

70. Closed vent systems and control devices used to comply with provisions Subpart GGG shall be operated at all times when emissions may be vented to them. [40 CFR 60.482-10(m)] Federally Enforceable Through Title V Permit

71. In conducting the performance tests required in 40 CFR 60.8, the owner or operator shall use as reference methods and procedures the test methods in 40 CFR 60, Appendix A or other methods and procedures as specified in 40 CFR 60.485, except as provided in 40 CFR 60.8(b). [40 CFR 60.485(a)] Federally Enforceable Through Title V Permit

72. The owner or operator shall determine compliance with the standards in 40 CFR 60.482, 60.483, and 60.484 as follows: Method 21 shall be used to determine the presence of leaking sources. The instrument shall be calibrated before use each day of its use by the procedures specified in Method 21. The following calibration gases shall be used: (i) Zero air (less than 10 ppm of hydrocarbon in air); and (ii) A mixture of methane or n-hexane and air at a concentration of about, but less than, 10,000 ppm methane or n-hexane. [40 CFR 60.485(b)] Federally Enforceable Through Title V Permit

73. The owner or operator shall determine compliance with the no detectable emission standards in 40 CFR 60.482-2(e), 60.482-3(i), 60.482-4, 60.482-7(f), and 60.482-10(e) as follows: 1) The requirements of 40 CFR 60.485(b) shall apply. 2) Method 21 shall be used to determine the background level. All potential leak interfaces shall be traversed as close to the interface as possible. The arithmetic difference between the maximum concentration indicated by the instrument and the background level is compared with 500 ppm for determining compliance. [40 CFR 60.485(c)] Federally Enforceable Through Title V Permit

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74. The owner or operator shall test each piece of equipment unless demonstrated that a process unit is not in VOC service, i.e., that the VOC content would never be reasonably expected to exceed 10 percent by weight. For purposes of this demonstration, the following methods and procedures shall be used: 1) Procedures that conform to the general methods in ASTM E260-73, 91, or 96, E168-67, 77, or 92, E169-63, 77, or 93 (incorporated by reference as seen in 40 CFR 60.17) shall be used to determine the percent VOC content in the process fluid that is contained in or contacts a piece of equipment; 2) Organic compounds that are considered by the Administrator to have negligible photochemical reactivity may be excluded from the total quantity of organic compounds in determining the VOC content of the process fluid; and 3) Engineering judgment may be used to estimate the VOC content, if a piece of equipment had not been shown previously to be in service. If the Administrator disagrees with the judgment, the previous two procedures as specified in 40 CFR 60.485(d)(1) and (2) shall be used to resolve the disagreement. [40 CFR 60.485(d)] Federally Enforceable Through Title V Permit

75. The owner or operator shall demonstrate that an equipment is in light liquid service by showing that all the following conditions apply: 1) The vapor pressure of one or more of the components is greater than 0.3 kPa at 20 °C (1.2 in. H2O at 68 degrees F). Standard reference texts or ASTM D2879-83, 96, or 97 (incorporated by reference as seen in 40 CFR 60.17) shall be used to determine the vapor pressures; 2) The total concentration of the pure components having a vapor pressure greater than 0.3 kPa at 20 degrees Celsius is equal to or greater than 20 percent by weight; and 3) The fluid is a liquid at operating conditions. [40 CFR 60.485(e)] Federally Enforceable Through Title V Permit

76. Samples used in conjunction with 40 CFR 60.485(d), (e), and (g) shall be representative of the process fluid that is contained in or contacts the equipment or the gas being combusted in the flare. [40 CFR 60.485(f)] Federally Enforceable Through Title V Permit

77. An owner or operator of more than one affected facility subject to the provisions Subpart GGG may comply with the recordkeeping requirements for these facilities in one recordkeeping system if the system identifies each record by each facility. [40 CFR 60.486(a)] Federally Enforceable Through Title V Permit

78. When each leak is detected as specified in 40 CFR 60.482-2, 60.482-3, 60.482-7, 60.482-8, and 60.483-2, the following requirements apply: 1) A weatherproof and readily visible identification, marked with the equipment identification number, shall be attached to the leaking equipment; 2) The identification on a valve may be removed after it has been monitored for 2 successive months as specified in 40 CFR 60.482-7(c) and no leak has been detected during those 2 months; and 3) The identification on equipment except on a valve, may be removed after it has been repaired. [40 CFR 60.486(b)] Federally Enforceable Through Title V Permit

79. When each leak is detected as specified in 40 CFR 60.482-2, 60.482-3, 60.482-7, 60.482-8, and 60.483-2, the following information shall be recorded in a log and shall be kept for 5 years in a readily accessible location: 1) The instrument and operator identification numbers and the equipment identification number; 2) The date the leak was detected and the dates of each attempt to repair the leak; 3) Repair methods applied in each attempt to repair the leak; 4) ``Above 10,000'' if the maximum instrument reading measured by the methods specified in 40 CFR 60.485(a) after each repair attempt is equal to or greater than 10,000 ppm; 5) ``Repair delayed'' and the reason for the delay if a leak is not repaired within 15 calendar days after discovery of the leak; 6) The signature of the owner or operator (or designate) whose decision it was that repair could not be effected without a process shutdown; 7) The expected date of successful repair of the leak if a leak is not repaired within 15 days; 8) Dates of process unit shutdown that occur while the equipment is unrepaired; and 9) The date of successful repair of the leak. [40 CFR 60.486(c) and District Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit

80. The following information pertaining to the design requirements for closed vent systems and control devices described in 40 CFR 60.482-10 shall be recorded and kept in a readily accessible location: 1) Detailed schematics, design specifications, and piping and instrumentation diagrams; 2) The dates and descriptions of any changes in the design specifications; 3) A description of the parameter or parameters monitored, as required in 40 CFR 60.482-10(e), to ensure that control devices are operated and maintained in conformance with their design and an explanation of why that parameter (or parameters) was selected for the monitoring; 4) Periods when the closed vent systems and control devices required in 40 CFR 60.482-2, 60.482-3, 60.482-4, and 60.482-5 are not operated as designed, including periods when a flare pilot light does not have a flame; and 5) Dates of startups and shutdowns of the closed vent systems and control devices required in 40 CFR 60.482-2, 60.482-3, 60.482-4, and 60.482-5. [40 CFR 60.486(d)] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

81. The following information pertaining to all equipment subject to the requirements in 40 CFR 60.482-1 to 60.482-10 shall be recorded in a log that is kept in a readily accessible location: 1) A list of identification numbers for equipment subject to the requirements of Subpart GGG; 2) (i) A list of identification numbers for equipment that are designated for no detectable emissions under the provisions of 40 CFR 60.482-2(e), 60.482-3(i) and 60.482-7(f). (ii) The designation of equipment as subject to the requirements of 40 CFR 60.482-2(e), 60.482-3(i) and 60.482-7(f) shall be signed by the owner or operator; 3) A list of equipment identification numbers for pressure relief devices required to comply with §60.482-4; 4) (i) The dates of each compliance test as required in 40 CFR 60.482-2(e), 60.482-3(i), §60.482-4, and 60.482-7(f). (ii) The background level measured during each compliance test. (iii) The maximum instrument reading measured at the equipment during each compliance test; and 5) A list of identification numbers for equipment in vacuum service. [40 CFR 60.486(e)] Federally Enforceable Through Title V Permit

82. The following information pertaining to all valves subject to the requirements of 40 CFR 60.482-7(g) and (h) and to all pumps subject to the requirements of 40 CFR 60.482-2(g) shall be recorded in a log that is kept in a readily accessible location: 1) A list of identification numbers for valves and pumps that are designated as unsafe-to-monitor, an explanation for each valve or pump stating why the valve or pump is unsafe-to-monitor, and the plan for monitoring each valve or pump; and 2) A list of identification numbers for valves that are designated as difficult-to-monitor, an explanation for each valve stating why the valve is difficult-to-monitor, and the schedule for monitoring each valve. [40 CFR 60.486(f)] Federally Enforceable Through Title V Permit

83. The following information shall be recorded for valves complying with 40 CFR 60.483-2: 1) A schedule of monitoring; 2) The percent of valves found leaking during each monitoring period. [40 CFR 60.486(g)] Federally Enforceable Through Title V Permit

84. The following information shall be recorded in a log that is kept in a readily accessible location: 1) Design criterion required in 40 CFR 60.482-2(d)(5) and 60.482-3(e)(2) and explanation of the design criterion; and 2) Any changes to this criterion and the reasons for the changes. [40 CFR 60.486(h)] Federally Enforceable Through Title V Permit

85. The following information shall be recorded in a log that is kept in a readily accessible location for use in determining exemptions as provided in 40 CFR 60.480(d): 1) An analysis demonstrating the design capacity of the affected facility; 2) A statement listing the feed or raw materials and products from the affected facilities and an analysis demonstrating whether these chemicals are heavy liquids or beverage alcohol; and 3) An analysis demonstrating that equipment is not in VOC service. [40 CFR 60.486(i)] Federally Enforceable Through Title V Permit

86. Information and data used to demonstrate that a piece of equipment is not in VOC service shall be recorded in a log that is kept in a readily accessible location. [40 CFR 60.486(j)] Federally Enforceable Through Title V Permit

87. All semiannual reports to the Administrator shall include the following information, summarized from the information in 40 CFR 60.486: 1) Process unit identification; 2) For each month during the semiannual reporting period, i) Number of valves for which leaks were detected as described in 40 CFR 60.482-7(b) or 40 CFR 60.483-2, (ii) Number of valves for which leaks were not repaired as required in 40 CFR 60.482-7(d)(1), (iii) Number of pumps for which leaks were detected as described in 40 CFR 60.482-2(b) and (d)(6)(i), (iv) Number of pumps for which leaks were not repaired as required in 40 CFR 60.482-2(c)(1) and (d)(6)(ii), (v) Number of compressors for which leaks were detected as described in 40 CFR 60.482-3(f), (vi) Number of compressors for which leaks were not repaired as required in 40 CFR 60.482-3(g)(1), and (vii) The facts that explain each delay of repair and, where appropriate, why a process unit shutdown was technically infeasible; 3) Dates of process unit shutdowns which occurred within the semiannual reporting period; 4) Revisions to items reported in the semiannual report if changes have occurred since the initial report, as required in 40 CFR 60.487 (a) and (b), or subsequent revisions to the initial report. [40 CFR 60.487(c)] Federally Enforceable Through Title V Permit

88. An owner or operator electing to comply with the provisions of 40 CFR 60.483-1 and 60.483-2 shall notify the Administrator of the alternative standard selected 90 days before implementing either of the provisions. [40 CFR 60.487(d)] Federally Enforceable Through Title V Permit

89. An owner or operator shall report the results of all performance tests in accordance with 40 CFR 60.8 of the General Provisions. The provisions of 40 CFR 60.8(d) do not apply to affected facilities subject to the provisions of Subpart GGG except that an owner or operator must notify the Administrator of the schedule for the initial performance tests at least 30 days before the initial performance tests. [40 CFR 60.487(e)] Federally Enforceable Through Title V Permit

90. The operator shall maintain all records of required monitoring data and support information for inspection at any time for a period of five years. [District Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

91. Each drain receiving refinery wastewater from a process unit shall be equipped with water seal controls. [40 CFR 60.692-2(a)(1)] Federally Enforceable Through Title V Permit

92. Each drain in active service, receiving refinery wastewater from a process unit, shall be checked by visual or physical inspection initially and monthly thereafter for indications of low water levels or other conditions that would reduce the effectiveness of the water seal controls. [40 CFR 60.692-2(a)(2)] Federally Enforceable Through Title V Permit

93. A component shall be considered leaking if one or more of the conditions specified in Sections 5.1.4.1 through 5.1.4.4 of Rule 4455 exist at the facility. For this permit unit, except for pumps and compressors, a minor gas leak shall be defined for any component listed in Rule 4455 Section 3.22 Table 1 in either liquid or gas/vapor service as a reading in excess of 100 ppmv above background up to and including a reading of 10,000 ppmv above background. For pumps, compressors and other component types not specifically listed in Rule 4455 Section 3.22 Table 1 in either liquid or gas/vapor service, a minor gas leak shall be defined as a reading in excess of 500 ppmv above background up to and including a reading of 10,000 ppmv above background. Readings shall be taken as methane using a portable hydrocarbon detection instrument and shall be made in accordance with the methods specified in Section 6.4.1 of Rule 4455. [District Rules 2201 and 4455, 5.1.4] Federally Enforceable Through Title V Permit

94. The operator shall not use any component that leaks in excess of the allowable leak standards of Rule 4455, or is found to be in violation of the provisions specified in Section 5.1.3. A component identified as leaking in excess of an allowable leak standard may be used provided it has been identified with a tag for repair, has been repaired, or is awaiting re-inspection after repair, within the applicable time period specified within the rule. [District Rule Rule 4455, 5.1.1] Federally Enforceable Through Title V Permit

95. Each hatch shall be closed at all times except during sampling or adding of process material through the hatch, or during attended repair, replacement, or maintenance operations, provided such activities are done as expeditiously as possible and with minimal spillage of material and VOC emissions to the atmosphere. [District Rule 4455, 5.1.2] Federally Enforceable Through Title V Permit

96. The operator shall be in violation of Rule 4455 if any District inspection demonstrates that one or more of the conditions in Sections 5.1.4 exist at the facility. [District Rule 4455, 5.1.3.1] Federally Enforceable Through Title V Permit

97. Except for annual operator inspection described in Section 5.1.3.2.3, any operator inspection that demonstrates that one or more of the conditions in Section 5.1.4 exist at the facility shall not constitute a violation of Rule 4455 if the leaking components are repaired as soon as practicable but not later than the time frame specified in Rule 4455. Such components shall not be counted towards determination of compliance with the provisions of Section 5.1.4. [District Rule 4455, 5.1.3.2.1] Federally Enforceable Through Title V Permit

98. Leaking components detected during operator inspection pursuant Section 5.1.3.2.1 that are not repaired, replaced, or removed from operation as soon as practicable but not later than the time frame specified in Rule 4455 shall be counted toward determination of compliance with the provisions of Section 5.1.4. [District Rule 4455, 5.1.3.2.2] Federally Enforceable Through Title V Permit

99. Any operator inspection conducted annually for a component type (including operator annual inspections pursuant to Section 5.2.5, 5.2.6, 5.2.7, or 5.2.8) that demonstrates one or more of the conditions in Section 5.1.4 exist at the facility shall constitute a violation of Rule 4455 regardless of whether or not the leaking components are repaired, replaced, or removed from operation within the allowable repair time frame specified in Rule 4455. [District Rule 4455, 5.1.3.2.3] Federally Enforceable Through Title V Permit

100. The operator shall audio-visually inspect for leaks all accessible operating pumps, compressors and Pressure Relief Devices (PRDs) in service at least once every 24 hours, except when operators do not report to the facility for that given 24 hours. Any identified leak that cannot be immediately repaired shall be reinspected within 24 hours using a portable analyzer. If a leak is found, it shall be repaired as soon as practical but not later than the time frame specified in Table 3. [District Rule 4455, 5.2.1 & 5.2.2] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

101. The operator shall inspect all components at least once every calendar quarter, except for inaccessible components, unsafe-to-monitor components and pipes. Inaccessible components, unsafe-to-monitor components and pipes shall be inspected in accordance with the requirements set forth in Sections 5.2.5, 5.2.6, and 5.2.7. New, replaced, or repaired fittings, flanges and threaded connections shall be inspected immediately after being placed into service. Components shall be inspected using EPA Method 21. [District Rule 4455, 5.2.3, 5.2.4, 5.2.5, 5.2.6 & 5.2.7] Federally Enforceable Through Title V Permit

102. The operator may apply for a written approval from the APCO to change the inspection frequency from quarterly to annually for a component type, provided the operator meets all the criteria specified in Sections 5.2.8.1 through 5.2.8.3. This approval shall apply to accessible component types, specifically designated by the APCO, except pumps, compressors, and PRDs which shall continue to be inspected on a quarterly basis. [District Rule 4455, 5.2.8] Federally Enforceable Through Title V Permit

103. An annual inspection frequency approved by the APCO shall revert to quarterly inspection frequency for a component type if either the operator inspection or District inspection demonstrates that a violation of the provisions of Sections 5.1, 5.2 and 5.3 of the rule exists for that component type, or the APCO issued a Notice of Violation for violating any of the provisions of Rule 4455 during the annual inspection period for that component type. When the inspection frequency changes from annual to quarterly inspections, the operator shall notify the APCO in writing within five (5) calendar days after changing the inspection frequency, giving the reason(s) and date of change to quarterly inspection frequency. [District Rule 4455, 5.2.9 & 5.2.10] Federally Enforceable Through Title V Permit

104. The operator shall initially inspect a process PRD that releases to the atmosphere as soon as practicable but not later than 24 hours after the time of the release. To insure that the process PRD is operating properly, and is leak-free, the operator shall re-inspect the process PRD not earlier than 24 hours after the initial inspection but not later than 15 calendar days after the date of the release using EPA Method 21. If the process PRD is found to be leaking at either inspection, the PRD leak shall be treated as if the leak was found during quarterly operator inspections. [District Rule 4455, 5.2.11] Federally Enforceable Through Title V Permit

105. Except for process PRD, a component shall be inspected within 15 calendar days after repairing the leak or replacing the component using EPA Method 21. [District Rule 4455, 5.2.12] Federally Enforceable Through Title V Permit

106. Upon detection of a leaking component, the operator shall affix to that component a weatherproof readily visible tag that contains the information specified in Section 5.3.3. The tag shall remain affixed to the component until the leaking component has been repaired or replaced; has been re-inspected using EPA Method 21; and is found to be in compliance with the requirements of Rule 4455. [District Rule 4455, 5.3.1 5.3.2 and 5.3.3] Federally Enforceable Through Title V Permit

107. An operator shall minimize all component leaks immediately to the extent possible, but not later than one (1) hour after detection of leaks in order to stop or reduce leakage to the atmosphere. [District Rule 4455, 5.3.4] Federally Enforceable Through Title V Permit

108. If the leak has been minimized but the leak still exceeds the applicable leak standards of Rule 4455, an operator shall repair or replace the leaking component, vent the leaking component to a closed vent system, or remove the leaking component from operation as soon as practicable but not later than the time period specified in Table 3. For each calendar quarter, the operator may be allowed to extend the repair period as specified in Table 3, for a total number of leaking components, not to exceed 0.05 percent of the number of components inspected, by type, rounded upward to the nearest integer where required. [District Rule 4455, 5.3.5] Federally Enforceable Through Title V Permit

109. If the leaking component is an essential component or a critical component and which cannot be immediately shut down for repairs, the operator shall minimize the leak within one hour after detection of the leak. If the leak has been minimized, but the leak still exceeds any of the applicable leak standards of Rule 4455, the essential component or critical component shall be repaired or replaced to eliminate the leak during the next process unit turnaround, but in no case later than one year from the date of the original leak detection, whichever comes earlier. [District Rule 4455 5.3.6] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

110. For any component that has incurred five repair actions for major gas leaks or major liquid leaks, or any combination of major gas leaks and major liquid leaks within a continuous 12-month period, the operator shall comply with at least one of the requirements specified in Sections 5.3.7.1, 5.3.7.2, 5.3.7.3, or 5.3.7.4 by the applicable deadlines specified in Sections 5.3.7.5 and 5.3.7.6. If the original leaking component is replaced with a new like-in-kind component before incurring five repair actions for major leaks within 12-consecutive months, the repair count shall start over for the new component. An entire compressor or pump need not be replaced provided the compressor part(s) or pump part(s) that have incurred five repair actions as described in Section 5.3.7 are brought into compliance with at least one of the requirements of Sections 5.3.7.1 through 5.3.7.6. [District Rule4455, 5.3.7] Federally Enforceable Through Title V Permit

111. The operator shall monitor process PRD by using electronic process control instrumentation that allows for real time continuous parameter monitoring or by using telltale indicators for the process PRD where parameter monitoring is not feasible. This requirement applies only to any process PRD that is vented to atmosphere. [District Rule 4455, 5.4.1] Federally Enforceable Through Title V Permit

112. All major components and critical components shall be physically identified clearly and visibly for inspection, repair, and recordkeeping purposes. The physical identification shall consist of labels, tags, manufacturer's nameplate identifier, serial number, or model number, or other system approved by the APCO that enables an operator or District personnel to locate each individual component. The operator shall replace tags or labels that become missing or unreadable as soon as practicable but not later than 24 hours after discovery. The operator shall comply with the requirements of Sections 6.1.4 if there is any change in the description of major components or critical components. [District Rule 4455, 5.5.1 & 5.5.2] Federally Enforceable Through Title V Permit

113. The operator shall keep a copy of the operator management plan at the facility and make it available to the APCO, ARB and US EPA upon request. By January 30 of each year, the operator shall submit to the APCO for approval, in writing, an annual report indicating any changes to the existing, approved operator management plan. [District Rule 4455, 6.1.2 & 6.1.4] Federally Enforceable Through Title V Permit

114. The operator shall maintain an inspection log containing, at a minimum, 1) total number of components inspected, and total number and percentage of leaking components found by component types, 2) location, type, name or description of each leaking component, and description of any unit where the leaking component is found, 3) date of leak detection and method of leak detection, 4) for gaseous leaks, record the leak concentration in ppmv, and for liquid leaks record whether the leak is a major liquid leak or a minor liquid leak, 5) date of repair, replacement, or removal from operation of leaking components, 6) identification and location of essential component and critical components found leaking that cannot be repaired until the next process unit turnaround or not later one year after leak detection, whichever comes earlier, 7) methods used to minimize the leak from essential components and critical components that cannot be repaired until the next process unit turnaround or not later one year after leak detection, whichever comes earlier, 8) after the component is repaired or is replaced, the date of reinspection and the leak concentration in ppmv, 9) inspector's name, business mailing address, and business telephone number, and 10) the facility operator responsible for the inspection and repair program shall sign and date the inspection log certifying the accuracy of the information recorded in the log. [District Rule 4455, 6.2.1] Federally Enforceable Through Title V Permit

115. Records of each calibration of the portable hydrocarbon detection instrument utilized for inspecting components, including a copy of current calibration gas certification from the vendor of said calibration gas cylinder, the date of calibration, concentration of calibration gas, analyzer reading of calibration gas before adjustment, instrument reading of calibration gas after adjustment, calibration gas expiration date, and calibration gas cylinder pressure at the time of calibration. [District Rule 4455, 6.2.3] Federally Enforceable Through Title V Permit

116. The operator shall notify the APCO, by telephone or other methods approved by the APCO, of any process PRD release described in Sections 5.4.4 and 5.4.5, and any release in excess of the reportable quantity limits as stipulated in 40 CFR, Part 117, Part 302 and Part 355, including any release in excess of 100 pounds of VOC, within one hour of such occurrence or within one hour of the time said person knew or reasonably should have known of its occurrence. This requirement applies only to any process PRD that is vented to atmosphere. [District Rule 4455, 6.3.1] Federally Enforceable Through Title V Permit

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CONDITIONS CONTINUE ON NEXT PAGE

117. The operator shall submit a written report to the APCO within thirty (30) calendar days following a PRD release subject to 6.3.1. The written report shall include 1) process PRD type, size, and location, 2) date, time and duration of the process PRD release, 3) types of VOC released and individual amounts, in pounds, including supporting calculations, 4) cause of the process PRD release, and 5) corrective actions taken to prevent a subsequent process PRD release. This requirement applies only to any process PRD that is vented to atmosphere. [District Rule4455 6.3.2] Federally Enforceable Through Title V Permit

118. Copies of all records shall be retained for a minimum of five (5) years after the date of an entry. Such records shall be made available to the APCO, ARB, or US EPA upon request. [District Rule 4455, 6.2.2, 6.2.3 & 6.2.4] Federally Enforceable Through Title V Permit

119. Measurements of gaseous leak concentrations shall be conducted according to US EPA Method 21 using an appropriate portable hydrocarbon detection instrument calibrated with methane. The instrument shall be calibrated in accordance with the procedures specified in US EPA Method 21 or the manufacturer's instruction, as appropriate, not more than 30 days prior to its use. The operator shall record the calibration date of the instrument. [District Rule 4455, 6.4.1] Federally Enforceable Through Title V Permit

120. The VOC content shall be determined using American Society of Testing and Materials (ASTM) D 1945 for gases and South Coast Air Quality Management District (SCAQMD) Method 304-91 for liquids. [District Rule 4455, 6.4.2] Federally Enforceable Through Title V Permit

121. The percent by volume liquid evaporated at 150 C shall be determined using ASTM D 86. [District Rule 4455, 6.4.3] Federally Enforceable Through Title V Permit

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

DRAFT

PERMIT NO: S-33-408-0 **ISSUANCE DATE:** DRAFT

LEGAL OWNER OR OPERATOR: BIG WEST OF CA, LLC
MAILING ADDRESS: 6451 ROSEDALE HWY (AREA 1 & 2)
BAKERSFIELD, CA 93308

LOCATION: 6451 ROSEDALE HWY (AREA 1 & 2)
BAKERSFIELD, CA 93308

EQUIPMENT DESCRIPTION:
VACUUM GAS OIL HYDRO-DE-SULFURIZATION (VGO-HDS) UNIT WITH FEED HEATER HAVING A HEAT INPUT RATING NOT EXCEEDING 47 MM BTU/HR AND EQUIPPED WITH ZEECO MODEL GLSF 11 ROUND FLAME AND ZEECO GLSF 7 FLAT FLAME BURNERS OR EQUIVALENT AND SELECTIVE CATALYTIC REDUCTION (SCR), FRACTIONATOR FEED HEATER HAVING A HEAT INPUT RATING NOT EXCEEDING 35 MM BTU/HR AND EQUIPPED WITH ZEECO MODEL GLSF 11 ROUND FLAME BURNERS OR EQUIVALENT AND SCR, INCLUDING HYDRO SOUR WATER AND PHENOLIC SOUR WATER 3-PHASE SEPARATORS, HYDRO SOUR WATER STRIPPING UNIT, AMINE TREATMENT UNIT, AND CAUSTIC FUEL GAS SCRUBBER TREATING AREA 3 GAS AND LOCATED DOWNSTREAM OF AMINE TREATMENT OPERATION (S-34-5)

CONDITIONS

1. {1829} The facility shall submit an application to modify the Title V permit in accordance with the timeframes and procedures of District Rule 2520. [District Rule 2520] Federally Enforceable Through Title V Permit
2. {1830} This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District NSR Rule] Federally Enforceable Through Title V Permit
3. Permittee shall submit to the District final design details for feed and fractionator feed process heaters and SCR NOx emission control system(s) at least 30 days prior to initiation of construction on this unit. [District Rule 2201] Federally Enforceable Through Title V Permit
4. Permittee shall obtain APCO approval for the use of any equivalent low-NOx burner not specifically approved by this ATC document prior to installation. Approval of any equivalent low-NOx burner shall be made by the APCO's determination that the submitted design and performance data for alternate burner are equivalent to an approved burner. [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 326-6900 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director / APCO

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DAVID WARNER, Director of Permit Services

S-33-408-0 : Sep 3 2008 9:03AM -- KARRSR : Joint Inspection Required with KARRSR

5. Permittee's request for approval of an equivalent low-NOx burner shall include at minimum the following information: burner manufacturer and model number, maximum heat input rating, manufacturer's performance and design specifications, manufacturer's burner drawings, and description of low-NOx operation. [District Rule 2201] Federally Enforceable Through Title V Permit
6. Within 30 days prior to initial startup of feed and fractionator feed process heaters, the operator shall provide and have approved by the District a startup/shutdown plan. The plan shall provide a description and the expected duration of each planned startup/shutdown activity, and how emissions will be controlled during these periods, consistent with good engineering practices and equipment manufacturer requirements. At a minimum the plan shall shall address the following: preparation; light-off, warm-up, and refractory drying-out of the process heaters; and introduction of feed into the process heaters. [District Rule 2201] Federally Enforceable Through Title V Permit
7. Permittee shall monitor and record exhaust gas temperature at selective catalytic reduction catalyst inlet. [District Rule 2201] Federally Enforceable Through Title V Permit
8. Ammonia injection grid shall be equipped with operational ammonia flowmeter and injection pressure indicator. [District Rule 2201] Federally Enforceable Through Title V Permit
9. Total sulfur content of fuel combusted in this unit shall not exceed 40 ppmv (measured as H_2S), based on a 4-hr rolling average. [District Rule 2201] Federally Enforceable Through Title V Permit
10. The duration of each startup period for each process heater shall not exceed 12.0 hours. The duration of each shutdown period for each process heater shall not exceed 9.0 hours. [District Rules 2201, 4305 and 4306] Federally Enforceable Through Title V Permit
11. During each startup and shutdown period, the emission control systems shall be in operation and emissions shall be minimized insofar as is technologically feasible. [District Rules 2201, 4305 and 4306] Federally Enforceable Through Title V Permit
12. The permittee shall maintain records of the duration of each startup and shutdown period for each process heater. [District Rules 2201, 4305 and 4306] Federally Enforceable Through Title V Permit
13. Except during startup and shutdown periods, emission rates shall not exceed any of the following: NOx (as NO_2): 5 ppmv @ 3% O_2, PM-10: 0.0076 lb/MMBtu, CO: 50pmv @ 3% O_2 (3-hr average basis) and 400 ppmv @ 3% O_2 (15 minute average basis), VOC: 0.0054 lb/MMBtu or ammonia slip: 10 ppmv @ 3% O_2 (3 hour rolling average basis). [District Rules 2201, 4305, 4306 and 4351 and 40 CFR 60.102a(g)(2)] Federally Enforceable Through Title V Permit
14. Emission rates of the feed heater shall not exceed any of the following: NOx (as NO_2): 6.8 lb/day, SOx (as SO_2): 6.3 lb/day, PM10: 8.4 lb/day, CO: 41.7 lb/day and VOC: 6.1 lb/day (non-fugitive). [District Rule 2201] Federally Enforceable Through Title V Permit
15. Emission rates of the fractionator feed heater shall not exceed any of the following: NOx (as NO_2): 5.1 lb/day, SOx (as SO_2): 4.7 lb/day, PM10: 6.3 lb/day, CO: 31.1 lb/day and VOC: 4.5 lb/day (non-fugitive). [District Rule 2201] Federally Enforceable Through Title V Permit
16. Fugitive VOC emissions from components associated with VGO-HDS unit shall not exceed 65.6 lb/day. [District Rule 2201] Federally Enforceable Through Title V Permit
17. Prior to operating equipment under this Authority to Construct, permittee shall surrender emission reduction credits to offset the calendar quarter emissions increases set forth below, at the distance offset ratio specified in Rule 2201 (as amended 12/15/05) Table 4.2 and the interpollutant offset ratio specified in this permit, NOx (as NO_2) - Q1: 1,087 lb, Q2: 1,087 lb, Q3: 1,087 lb, and Q4: 1,087 lb; SOx (as SO_2) - Q1: 1,004 lb, Q2: 1,004 lb, Q3: 1,004 lb and Q4: 1,004 lb; PM10 - Q1: 1,342 lb, Q2: 1,342 lb, Q3: 1,342 lb and Q4: 1,342 lb; CO - Q1: 6,643 lb, Q2: 6,643 lb, Q3: 6,643 lb and Q4: 6,643 lb, and VOC - Q1: 6,954 lb, Q2: 6,954 lb, Q3: 6,954 lb and Q4: 6,954 lb. [District Rule 2201] Federally Enforceable Through Title V Permit

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18. ERC Certificate Number S-2183-2 (or certificates split from this certificate) shall be used to supply the required NOx and PM10 offsets, ERC Certificate Number S-2178-3 (or a certificate split from this certificate) shall be used to supply the required CO offsets, ERC Certificate Number S-2452-1 (or a certificate split from this certificate) shall be used to supply the required VOC offsets and ERC Certificate Numbers S-2177-5 and/or S-2184-5 (or certificates split from these certificates) shall be used to supply the required SOx, unless a revised offsetting proposal is received and approved by the District, upon which this Authority to Construct shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of this Authority to Construct. [District Rule 2201] Federally Enforceable Through Title V Permit

19. NOx ERCs may be used to offset PM10 emission increases at a ratio of 2.16 lb NOx : 1 lb PM10. [District Rule 2201] Federally Enforceable Through Title V Permit

20. At least once per week for an initial period of six weeks, and thereafter, at least once every six months, permittee shall obtain and analyze a representative sample for total reduced sulfur of the fuel combusted in this unit. Samples shall be analysed using ASTM Test Method D6228-98, D4468-85 or D1072-06, or an alternative analytical method approved in advance by the APCO. [District Rule 2201] Federally Enforceable Through Title V Permit

21. This unit shall be equipped with a continuous monitoring system to measure and record fuel consumption. [District Rules 2201 and 4001] Federally Enforceable Through Title V Permit

22. Exhaust duct downstream of the SCR unit shall be equipped with continuously recording emissions monitors (CEMS) for NOx, and O2. All CEMS shall be dedicated to this unit. CEMS shall meet the requirements of 40 CFR Part 60. [District Rule 1080] Federally Enforceable Through Title V Permit

23. The facility shall install and maintain equipment, facilities, and systems compatible with the District's CEM data polling software system and shall make CEM data available to the District's automated polling system on a daily basis. [District Rule 1080] Federally Enforceable Through Title V Permit

24. Upon notice by the District that the facility's CEM system is not providing polling data, the facility may continue to operate without providing automated data for a maximum of 30 days per calendar year provided the CEM data is sent to the District by a District-approved alternative method. [District Rule 1080] Federally Enforceable Through Title V Permit

25. The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NOx, CO, and O2 analyzer during District inspections. The sampling ports shall be located in accordance with the CARB regulation titled California Air Resources Board Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing. [District Rule 1081] Federally Enforceable Through Title V Permit

26. The permittee shall monitor and record the stack concentration of CO at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last month. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

27. If the CO concentrations corrected to 3% O2, as measured by the portable analyzer, exceed the allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 1 hour of operation after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 1 hour of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

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28. All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

29. The permittee shall maintain records of: (1) the date and time of CO measurements, (2) the O2 concentration in percent and the measured CO concentrations corrected to 3% O2, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

30. The permittee shall demonstrate continuous compliance with the sulfur content limit of the fuel combusted in this unit by calculation, as the product of the fuel H2S concentration and the ratio of total sulfur to H2S, based on the most recently conducted fuel sample analysis for total sulfur. The total sulfur of the fuel shall be calculated for each one hour H2S monitoring result, and the hourly fuel sulfur values shall be averaged over a rolling three hour period to determine compliance. [District Rule 2201] Federally Enforceable Through Title V Permit

31. Within 90 days of commencement of normal, continuous operation of this unit, operator shall inspect all components for leaks using a portable hydrocarbon detection instrument and the methods specified in Section 6.4.1 of Rule 4455, except for those components that are specifically exempted from the requirements of Rule 4455. [District Rule 2201] Federally Enforceable Through Title V Permit

32. Operator shall demonstrate compliance with fugitive VOC emissions limit of this permit within 60 days after the completion of the initial inspection of components and annually thereafter within 60 days after completion of the annual inspection of components required by Rule 4455. Compliance shall be demonstrated by calculation, using the correlation equations, zero default and 10,000 ppmv pegged factors set forth in the CAPCOA California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities, Table IV-3a, February 1999, and the average emission concentrations of total organic compounds measured for each component during all inspections conducted during the prior 365 day period. [District Rule 2201] Federally Enforceable Through Title V Permit

33. The permittee shall monitor and record the stack concentration of ammonia (NH3) at least once during each month in which a source test is not performed. NH3 monitoring shall be conducted utilizing Draeger tubes or a District approved equivalent method. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within one day of restarting the unit unless monitoring has been performed within the last month. [District Rule 4102]

34. The permittee shall maintain records of: (1) the date and time of ammonia (NH3) measurements, (2) the O2 concentration in percent by volume and the measured NH3 concentrations corrected to 3% O2, (3) the method of determining the NH3 emission concentration, and (4) a description of any corrective action taken to maintain the emissions at or below the acceptable levels. [District Rule 4102]

35. Compliance with NOx, CO, PM10 and ammonia slip emission limits shall be demonstrated within 120 days of initial operation. Compliance with NOx, CO and ammonia slip emission limits shall be demonstrated once every twelve months thereafter. Compliance demonstration shall be by District authorized in situ sampling of heater vent stack exhaust gases by a qualified independent source test firm at conditions representative of normal operation. [District Rules 2201, 4102, 4305, 4306 and 4351] Federally Enforceable Through Title V Permit

36. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified 30 days prior to any compliance source test, and a source test plan must be submitted for approval 15 days prior to testing. [District Rule 1081] Federally Enforceable Through Title V Permit

37. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081] Federally Enforceable Through Title V Permit

38. The following test methods shall be used: NOx EPA Method 7E or ARB Method 100; CO EPA method 10, 10B or ARB Method 100; O2 EPA Method 3, 3A, or ARB Method 100; and VOC EPA method 18 or 25. EPA approved alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rules 1081, 2201, 4305, 4306 and 4351] Federally Enforceable Through Title V Permit

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39. Compliance demonstration shall be based on the arithmetic mean, pursuant to District Rule 1081(amended December 16, 1993), of 3 thirty-minute test runs for NO_x and CO. [District Rule 2520, 9.3.2] Federally Enforceable Through Title V Permit

40. All required source testing shall conform to the compliance testing procedures described in District Rule 1081(Last Amended December 19, 1993). [District Rule 1081, and Kern County Rule 108.1] Federally Enforceable Through Title V Permit

41. {588} Particulate matter emissions shall not exceed 0.1 grain/dscf, 0.1 grain/dscf calculated to 12% CO_2, nor 10 lb/hr. [District Rules 4201, 3.1 and 4301, 5.1 and 5.2.3] Federally Enforceable Through Title V Permit

42. Emissions of sulfur compounds from this unit shall not exceed 200 lb per hour, calculated as SO_2. Compliance with this requirement shall be demonstrated by multiplying the sulfur content (ppmv, as total reduced sulfur) by the hourly volumetric fuel flow (scf/hr) to this unit, and converting to SO_2. [District Rule 2520, 9.3.2 and District Rule 4301, 5.2.1] Federally Enforceable Through Title V Permit

43. If fuel analysis is used to demonstrate compliance with the conditions of this permit, the fuel higher heating value for each fuel shall be certified by third party fuel supplier or determined by: ASTM D 1826 or D 1945 in conjunction with ASTM D 3588 for gaseous fuels. [District Rule 2520, 9.3.2; 4305, 6.2.1; and 4351, 6.2.1] Federally Enforceable Through Title V Permit

44. The concentration of sulfur compounds in the exhaust from this unit shall not exceed 0.2% by volume as measured on a dry basis over a 15 minute period (Kern County Rule 407). To demonstrate compliance with this requirement the operator shall test the sulfur content of each fuel source and demonstrate the sulfur content does not exceed 3.3% by weight for gaseous fuels; or determine that the concentration of sulfur compounds in the exhaust does not exceed the concentration limit by a combination of source testing and fuel analysis. [District Rule 4801 and Kern County Rule 407] Federally Enforceable Through Title V Permit

45. Nitrogen oxide (NO_x) emissions shall not exceed 140 lb/hr, calculated as NO_2. [District Rules 4301, 5.2.2] Federally Enforceable Through Title V Permit

46. Operators shall not depressurize any vessel containing VOCs unless the process unit turnaround is accomplished by employing one of the following operating procedures: The organic vapors shall either be recovered, added to the refinery fuel gas system and combusted; or controlled and piped to an appropriate firebox or incinerated for combustion; or flared, until the pressure within the process vessel is as close to atmospheric pressure as is possible. All process vessels shall be depressurized into the control facilities to less than 1020 mm Hg (5 psig) before venting/opening to atmosphere. All organic compounds which emerge from a refinery process vessel during the purging of said vessel and which otherwise would be emitted to the atmosphere shall be either directed to a flare or incinerator or shall be used for fuel until such disposition of emissions is not technically feasible or is less safe than atmospheric venting. [District Rule 4454, 4.0] Federally Enforceable Through Title V Permit

47. The operator shall not burn in any fuel gas combustion device any fuel that contains hydrogen sulfide (H_2S) in excess of 162 ppmv determined hourly on a 3 hour rolling average basis and H_2S in excess of 60 ppmv determined daily on a 365 successive calendar day rolling average basis. [40 CFR 60.102a(g)(1)(ii)] Federally Enforceable Through Title V Permit

48. A continuous emissions monitoring system for fuel gas H_2S shall be installed, calibrated, operated, and reported according to EPA guidelines as specified under 40 CFR 60.107a(a)(2). CEM results shall be calculated on a rolling three (3) hour basis. [40 CFR 60, 60.107a(a)(2)] Federally Enforceable Through Title V Permit

49. Operator shall report all rolling 3-hour periods during which the average concentration of H_2S as measured by the H_2S continuous monitoring system exceeds 162 ppmv and all rolling 365-day periods during which the average concentration of H_2S as measured by the H_2S continuous monitoring system exceeds 60 ppmv. [40 CFR 60.107a(f)] Federally Enforceable Through Title V Permit

50. Operator shall determine compliance with the H_2S standard using EPA Methods 11, 15, 15A, or 16. [40 CFR 60.104a(j)] Federally Enforceable Through Title V Permit

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51. Operator shall conduct a root cause analysis of any emission limit exceedance or process start-up, shutdown, upset, or malfunction that causes a discharge to the atmosphere in excess of 500 lb/day of SO2. For any root cause analysis performed, the owner or operator shall record the identification of the affected facility, the date and duration of the discharge, the results of the root cause analysis, and the action taken as a result of the root cause analysis. [40 CFR 60.103a(b)] Federally Enforceable Through Title V Permit

52. The owner or operator shall comply with the requirements 40 CFR 60.482-1 to 40 CFR 60.482-10 as soon as practical, but no later than 180 days after initial start. [40 CFR 60.592(a)] Federally Enforceable Through Title V Permit

53. Each pump in light liquid service (PLLS) shall be monitored monthly to detect leaks by the methods specified in 40 CFR 60.485(b), except as provided in 40 CFR 60.482-1(c) and 40 CFR 60.482-2(d), (e), and (f). Each pump in light liquid service shall be checked by visual inspection each calendar week for indications of liquids dripping from the pump seal. A leak is detected if an instrument reading of 10,000 ppm or greater is measured or if there are indications of liquids dripping from the pump seal. [40 CFR 60.482-2(a) and (b)] Federally Enforceable Through Title V Permit

54. When a leak is detected for each PLLS, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in 40 CFR 60.482-9. A first attempt at repair shall be made no later than 5 calendar days after each leak is detected. [40 CFR 60.482-2(c)] Federally Enforceable Through Title V Permit

55. Each PLLS equipped with a dual mechanical seal system that includes a barrier fluid system is exempt from the requirements of 40 CFR 60.482-2(a) provided the requirements specified in 40 CFR 60.482-2(d)(1) through (6) are met. [40 CFR 60.482(d)] Federally Enforceable Through Title V Permit

56. Any PLLS that is designated, as described in 40 CFR 60.486(e)(1) and (2), for no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, is exempt from the requirements of 40 CFR 60.482-2(a), (c), and (d) if the pump meets the requirements specified in 40 CFR 60.482-2(e)(1), (2), and (3). [40 CFR 60.482-2(e)] Federally Enforceable Through Title V Permit

57. If any PLLS is equipped with a closed vent system capable of capturing and transporting leakage from the seal or seals to a control device that complies with the requirements of 40 CFR 60.482-10, it is exempt from the requirements of 40 CFR 60.482-2(a) through (e). [40 CFR 60.482-2(f)] Federally Enforceable Through Title V Permit

58. Any pump in PLLS that is designated, as described in 40 CFR 60.486(f)(1), as an unsafe-to-monitor pump is exempt from the monitoring and inspection requirements of 40 CFR 60.482-2(a) and 40 CFR 60.482-2(d)(4) through (6) if: 1). The owner or operator of the pump demonstrates that the pump is unsafe-to-monitor because monitoring personnel would be exposed to an immediate danger as a consequence of complying with 40 CFR 60.482-2(a); and 2) The owner or operator of the pump has a written plan that requires monitoring of the pump as frequently as practicable during safe-to-monitor times but not more frequently than the periodic monitoring schedule otherwise applicable, and repair of the equipment according to the procedures in 40 CFR 60.482-2(c) if a leak is detected. [40 CFR 60.482-2(g)] Federally Enforceable Through Title V Permit

59. Pressure relief devices shall be vented to refinery flare gas recovery system. [40 CFR 60.482-4(c)] Federally Enforceable Through Title V Permit

60. Except for in-situ sampling systems and sampling systems without purges, each sampling connection system shall be equipped with a closed-purge, closed-loop, or closed-vent system, except as provided in 40 CFR 60.482-1(c). Each closed-purge, closed-loop, or closed-vent system shall comply with the requirements specified in 40 CFR 60.482-5(b)(1), (2), (3), and (4). [40 CFR 60.482-5(a), (b), and (c)] Federally Enforceable Through Title V Permit

61. Each open-ended valve or line shall be equipped with a cap, blind flange, plug, or a second valve, except as provided in 40 CFR 60.482-1(c). The cap, blind flange, plug, or second valve shall seal the open end at all times except during operations requiring process fluid flow through the open-ended valve or line. When a double block-and-bleed system is being used, the bleed valve or line may remain open during operations that require venting the line between the block valves but shall comply with this condition at all other times. [40 CFR 60.482-6(a) and (c)] Federally Enforceable Through Title V Permit

62. Each open-ended valve or line equipped with a second valve shall be operated in a manner such that the valve on the process fluid end is closed before the second valve is closed. [40 CFR 60.482-6(b)] Federally Enforceable Through Title V Permit

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63. Each valve in gas/vapor service and in light liquid service shall be monitored monthly to detect leaks by the methods specified in 40 CFR 60.485(b) and shall comply with 40 CFR 60.482-7(b) through (e), except as provided in 40 CFR 60.482-7(f), (g), and (h), 40 CFR 60.483-1, 40 CFR 60.483-2, and 40 CFR 60.482-1(c). A leak is detected if an instrument reading of 10,000 ppm or greater is measured. [40 CFR 60.482-7(a) and (b)] Federally Enforceable Through Title V Permit

64. Any valve in gas/vapor service or in light liquid service for which a leak is not detected for 2 successive months may be monitored the first month of every quarter, beginning with the next quarter, until a leak is detected. If a leak is detected, the valve shall be monitored monthly until a leak is not detected for 2 successive months. [40 CFR 60.482-7(c)] Federally Enforceable Through Title V Permit

65. When a leak is detected for any valve in gas/vapor service or in light liquid service, it shall be repaired as soon as practicable, but no later than 15 calendar days after the leak is detected, except as provided in 40 CFR 60.482-9. A first attempt at repair shall be made no later than 5 calendar days after each leak is detected. First attempts at repair include, but are not limited to, the best practices specified in 40 CFR 60.482-7(e)(1), (2), (3), and (4), where practicable. [40 CFR 60.482-7(d) and (e)] Federally Enforceable Through Title V Permit

66. If evidence of a potential leak is found by visual, audible, olfactory, or any other detection method at pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and connectors, the owner or operator shall follow either one of the following procedures: 1) The owner or operator shall monitor the equipment within 5 days by the method specified in 40 CFR 60.485(b) and shall comply with the requirements of 40 CFR 60.482-8(b) through (d); or 2) The owner or operator shall eliminate the visual, audible, olfactory, or other indication of a potential leak. A leak is detected if an instrument reading of 10,000 ppm or greater is measured. [40 CFR 60.482-8(a) and (b)] Federally Enforceable Through Title V Permit

67. When a leak is detected in pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and connectors, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in 40 CFR 60.482-9. The first attempt at repair shall be made no later than 5 calendar days after each leak is detected. First attempts at repair include, but are not limited to, the best practices described under 40 CFR 60.482-7(e). [40 CFR 60.482-8(c) and (d)] Federally Enforceable Through Title V Permit

68. Except as provided in 40 CFR 60.482-10(i) through (k), each closed vent system used to comply with the provisions of Subpart GGG shall be inspected according to the procedures and schedule specified in 40 CFR 60.482-10(f)(1) and (f)(2). Leaks, as indicated by an instrument reading greater than 500 parts per million by volume above background or by visual inspections, shall be repaired as soon as practicable except as provided in 40 CFR 60.482-10(h). A first attempt at repair shall be made no later than 5 calendar days after the leak is detected. Repair shall be completed no later than 15 calendar days after the leak is detected. [40 CFR 60.482-10(f) and (g)] Federally Enforceable Through Title V Permit

69. Delay of repair of a closed vent system for which leaks have been detected is allowed if the repair is technically infeasible without a process unit shutdown or if the owner or operator determines that emissions resulting from immediate repair would be greater than the fugitive emissions likely to result from delay of repair. Repair of such equipment shall be complete by the end of the next process unit shutdown. [40 CFR 60.482-10(h)] Federally Enforceable Through Title V Permit

70. The owner or operator shall record the following information: 1) Identification of all parts of the closed vent system that are designated as unsafe to inspect, an explanation of why the equipment is unsafe to inspect, and the plan for inspecting the equipment; 2) Identification of all parts of the closed vent system that are designated as difficult to inspect, an explanation of why the equipment is difficult to inspect, and the plan for inspecting the equipment; 3) For each inspection during which a leak is detected, a record of the information specified in 40 CFR 60.486(c); 4) For each inspection conducted in accordance with 40 CFR 60.485(b) during which no leaks are detected, a record that the inspection was performed, the date of the inspection, and a statement that no leaks were detected; and 5) For each visual inspection conducted in accordance with 40 CFR 60.482-10(f)(1)(ii) during which no leaks are detected, a record that the inspection was performed, the date of the inspection, and a statement that no leaks were detected. [40 CFR 60.482-10(l)] Federally Enforceable Through Title V Permit

71. Closed vent systems and control devices used to comply with provisions Subpart GGG shall be operated at all times when emissions may be vented to them. [40 CFR 60.482-10(m)] Federally Enforceable Through Title V Permit

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72. In conducting the performance tests required in 40 CFR 60.8, the owner or operator shall use as reference methods and procedures the test methods in 40 CFR 60, Appendix A or other methods and procedures as specified in 40 CFR 60.485, except as provided in 40 CFR 60.8(b). [40 CFR 60.485(a)] Federally Enforceable Through Title V Permit

73. The owner or operator shall determine compliance with the standards in 40 CFR 60.482, 60.483, and 60.484 as follows: Method 21 shall be used to determine the presence of leaking sources. The instrument shall be calibrated before use each day of its use by the procedures specified in Method 21. The following calibration gases shall be used: (i) Zero air (less than 10 ppm of hydrocarbon in air); and (ii) A mixture of methane or n-hexane and air at a concentration of about, but less than, 10,000 ppm methane or n-hexane. [40 CFR 60.485(b)] Federally Enforceable Through Title V Permit

74. The owner or operator shall determine compliance with the no detectable emission standards in 40 CFR 60.482-2(e), 60.482-3(i), 60.482-4, 60.482-7(f), and 60.482-10(e) as follows: 1) The requirements of 40 CFR 60.485(b) shall apply. 2) Method 21 shall be used to determine the background level. All potential leak interfaces shall be traversed as close to the interface as possible. The arithmetic difference between the maximum concentration indicated by the instrument and the background level is compared with 500 ppm for determining compliance. [40 CFR 60.485(c)] Federally Enforceable Through Title V Permit

75. The owner or operator shall test each piece of equipment unless demonstrated that a process unit is not in VOC service, i.e., that the VOC content would never be reasonably expected to exceed 10 percent by weight. For purposes of this demonstration, the following methods and procedures shall be used: 1) Procedures that conform to the general methods in ASTM E260-73, 91, or 96, E168-67, 77, or 92, E169-63, 77, or 93 (incorporated by reference as seen in 40 CFR 60.17) shall be used to determine the percent VOC content in the process fluid that is contained in or contacts a piece of equipment; 2) Organic compounds that are considered by the Administrator to have negligible photochemical reactivity may be excluded from the total quantity of organic compounds in determining the VOC content of the process fluid; and 3) Engineering judgment may be used to estimate the VOC content, if a piece of equipment had not been shown previously to be in service. If the Administrator disagrees with the judgment, the previous two procedures as specified in 40 CFR 60.485(d)(1) and (2) shall be used to resolve the disagreement. [40 CFR 60.485(d)] Federally Enforceable Through Title V Permit

76. The owner or operator shall demonstrate that an equipment is in light liquid service by showing that all the following conditions apply: 1) The vapor pressure of one or more of the components is greater than 0.3 kPa at 20 °C (1.2 in. H2O at 68 degrees F). Standard reference texts or ASTM D2879-83, 96, or 97 (incorporated by reference as seen in 40 CFR 60.17) shall be used to determine the vapor pressures; 2) The total concentration of the pure components having a vapor pressure greater than 0.3 kPa at 20 degrees Celsius is equal to or greater than 20 percent by weight; and 3) The fluid is a liquid at operating conditions. [40 CFR 60.485(e)] Federally Enforceable Through Title V Permit

77. Samples used in conjunction with 40 CFR 60.485(d), (e), and (g) shall be representative of the process fluid that is contained in or contacts the equipment or the gas being combusted in the flare. [40 CFR 60.485(f)] Federally Enforceable Through Title V Permit

78. An owner or operator of more than one affected facility subject to the provisions Subpart GGG may comply with the recordkeeping requirements for these facilities in one recordkeeping system if the system identifies each record by each facility. [40 CFR 60.486(a)] Federally Enforceable Through Title V Permit

79. When each leak is detected as specified in 40 CFR 60.482-2, 60.482-3, 60.482-7, 60.482-8, and 60.483-2, the following requirements apply: 1) A weatherproof and readily visible identification, marked with the equipment identification number, shall be attached to the leaking equipment; 2) The identification on a valve may be removed after it has been monitored for 2 successive months as specified in 40 CFR 60.482-7(c) and no leak has been detected during those 2 months; and 3) The identification on equipment except on a valve, may be removed after it has been repaired. [40 CFR 60.486(b)] Federally Enforceable Through Title V Permit

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80. When each leak is detected as specified in 40 CFR 60.482-2, 60.482-3, 60.482-7, 60.482-8, and 60.483-2, the following information shall be recorded in a log and shall be kept for 5 years in a readily accessible location: 1) The instrument and operator identification numbers and the equipment identification number; 2) The date the leak was detected and the dates of each attempt to repair the leak; 3) Repair methods applied in each attempt to repair the leak; 4) ``Above 10,000'' if the maximum instrument reading measured by the methods specified in 40 CFR 60.485(a) after each repair attempt is equal to or greater than 10,000 ppm; 5) ``Repair delayed'' and the reason for the delay if a leak is not repaired within 15 calendar days after discovery of the leak; 6) The signature of the owner or operator (or designate) whose decision it was that repair could not be effected without a process shutdown; 7) The expected date of successful repair of the leak if a leak is not repaired within 15 days; 8) Dates of process unit shutdown that occur while the equipment is unrepaired; and 9) The date of successful repair of the leak. [40 CFR 60.486(c) and District Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit

81. The following information pertaining to the design requirements for closed vent systems and control devices described in 40 CFR 60.482-10 shall be recorded and kept in a readily accessible location: 1) Detailed schematics, design specifications, and piping and instrumentation diagrams; 2) The dates and descriptions of any changes in the design specifications; 3) A description of the parameter or parameters monitored, as required in 40 CFR 60.482-10(e), to ensure that control devices are operated and maintained in conformance with their design and an explanation of why that parameter (or parameters) was selected for the monitoring; 4) Periods when the closed vent systems and control devices required in 40 CFR 60.482-2, 60.482-3, 60.482-4, and 60.482-5 are not operated as designed, including periods when a flare pilot light does not have a flame; and 5) Dates of startups and shutdowns of the closed vent systems and control devices required in 40 CFR 60.482-2, 60.482-3, 60.482-4, and 60.482-5. [40 CFR 60.486(d)] Federally Enforceable Through Title V Permit

82. The following information pertaining to all equipment subject to the requirements in 40 CFR 60.482-1 to 60.482-10 shall be recorded in a log that is kept in a readily accessible location: 1) A list of identification numbers for equipment subject to the requirements of Subpart GGG; 2) (i) A list of identification numbers for equipment that are designated for no detectable emissions under the provisions of 40 CFR 60.482-2(e), 60.482-3(i) and 60.482-7(f). (ii) The designation of equipment as subject to the requirements of 40 CFR 60.482-2(e), 60.482-3(i) and 60.482-7(f) shall be signed by the owner or operator; 3) A list of equipment identification numbers for pressure relief devices required to comply with §60.482-4; 4) (i) The dates of each compliance test as required in 40 CFR 60.482-2(e), 60.482-3(i), §60.482-4, and 60.482-7(f). (ii) The background level measured during each compliance test. (iii) The maximum instrument reading measured at the equipment during each compliance test; and 5) A list of identification numbers for equipment in vacuum service. [40 CFR 60.486(e)] Federally Enforceable Through Title V Permit

83. The following information pertaining to all valves subject to the requirements of 40 CFR 60.482-7(g) and (h) and to all pumps subject to the requirements of 40 CFR 60.482-2(g) shall be recorded in a log that is kept in a readily accessible location: 1) A list of identification numbers for valves and pumps that are designated as unsafe-to-monitor, an explanation for each valve or pump stating why the valve or pump is unsafe-to-monitor, and the plan for monitoring each valve or pump; and 2) A list of identification numbers for valves that are designated as difficult-to-monitor, an explanation for each valve stating why the valve is difficult-to-monitor, and the schedule for monitoring each valve. [40 CFR 60.486(f)] Federally Enforceable Through Title V Permit

84. The following information shall be recorded for valves complying with 40 CFR 60.483-2: 1) A schedule of monitoring; 2) The percent of valves found leaking during each monitoring period. [40 CFR 60.486(g)] Federally Enforceable Through Title V Permit

85. The following information shall be recorded in a log that is kept in a readily accessible location: 1) Design criterion required in 40 CFR 60.482-2(d)(5) and 60.482-3(e)(2) and explanation of the design criterion; and 2) Any changes to this criterion and the reasons for the changes. [40 CFR 60.486(h)] Federally Enforceable Through Title V Permit

86. The following information shall be recorded in a log that is kept in a readily accessible location for use in determining exemptions as provided in 40 CFR 60.480(d): 1) An analysis demonstrating the design capacity of the affected facility; 2) A statement listing the feed or raw materials and products from the affected facilities and an analysis demonstrating whether these chemicals are heavy liquids or beverage alcohol; and 3) An analysis demonstrating that equipment is not in VOC service. [40 CFR 60.486(i)] Federally Enforceable Through Title V Permit

87. Information and data used to demonstrate that a piece of equipment is not in VOC service shall be recorded in a log that is kept in a readily accessible location. [40 CFR 60.486(j)] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

88. All semiannual reports to the Administrator shall include the following information, summarized from the information in 40 CFR 60.486: 1) Process unit identification; 2) For each month during the semiannual reporting period, i) Number of valves for which leaks were detected as described in 40 CFR 60.482-7(b) or 40 CFR 60.483-2, (ii) Number of valves for which leaks were not repaired as required in 40 CFR 60.482-7(d)(1), (iii) Number of pumps for which leaks were detected as described in 40 CFR 60.482-2(b) and (d)(6)(i), (iv) Number of pumps for which leaks were not repaired as required in 40 CFR 60.482-2(c)(1) and (d)(6)(ii), (v) Number of compressors for which leaks were detected as described in 40 CFR 60.482-3(f), (vi) Number of compressors for which leaks were not repaired as required in 40 CFR 60.482-3(g)(1), and (vii) The facts that explain each delay of repair and, where appropriate, why a process unit shutdown was technically infeasible; 3) Dates of process unit shutdowns which occurred within the semiannual reporting period; 4) Revisions to items reported in the semiannual report if changes have occurred since the initial report, as required in 40 CFR 60.487 (a) and (b), or subsequent revisions to the initial report. [40 CFR 60.487(c)] Federally Enforceable Through Title V Permit

89. An owner or operator electing to comply with the provisions of 40 CFR 60.483-1 and 60.483-2 shall notify the Administrator of the alternative standard selected 90 days before implementing either of the provisions. [40 CFR 60.487(d)] Federally Enforceable Through Title V Permit

90. An owner or operator shall report the results of all performance tests in accordance with 40 CFR 60.8 of the General Provisions. The provisions of 40 CFR 60.8(d) do not apply to affected facilities subject to the provisions of Subpart GGG except that an owner or operator must notify the Administrator of the schedule for the initial performance tests at least 30 days before the initial performance tests. [40 CFR 60.487(e)] Federally Enforceable Through Title V Permit

91. The operator shall maintain all records of required monitoring data and support information for inspection at any time for a period of five years. [District Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit

92. A component shall be considered leaking if one or more of the conditions specified in Sections 5.1.4.1 through 5.1.4.4 of Rule 4455 exist at the facility. For this permit unit, except for pumps and compressors, a minor gas leak shall be defined for any component listed in Rule 4455 Section 3.22 Table 1 in either liquid or gas/vapor service as a reading in excess of 100 ppmv above background up to and including a reading of 10,000 ppmv above background. For pumps, compressors and other component types not specifically listed in Rule 4455 Section 3.22 Table 1 in either liquid or gas/vapor service, a minor gas leak shall be defined as a reading in excess of 500 ppmv above background up to and including a reading of 10,000 ppmv above background. Readings shall be taken as methane using a portable hydrocarbon detection instrument and shall be made in accordance with the methods specified in Section 6.4.1 of Rule 4455. [District Rules 2201 and 4455, 5.1.4] Federally Enforceable Through Title V Permit

93. The operator shall not use any component that leaks in excess of the allowable leak standards of Rule 4455, or is found to be in violation of the provisions specified in Section 5.1.3. A component identified as leaking in excess of an allowable leak standard may be used provided it has been identified with a tag for repair, has been repaired, or is awaiting re-inspection after repair, within the applicable time period specified within the rule. [District Rule Rule 4455, 5.1.1] Federally Enforceable Through Title V Permit

94. Each hatch shall be closed at all times except during sampling or adding of process material through the hatch, or during attended repair, replacement, or maintenance operations, provided such activities are done as expeditiously as possible and with minimal spillage of material and VOC emissions to the atmosphere. [District Rule 4455, 5.1.2] Federally Enforceable Through Title V Permit

95. The operator shall be in violation of Rule 4455 if any District inspection demonstrates that one or more of the conditions in Sections 5.1.4 exist at the facility. [District Rule 4455, 5.1.3.1] Federally Enforceable Through Title V Permit

96. Except for annual operator inspection described in Section 5.1.3.2.3, any operator inspection that demonstrates one or more of the conditions in Section 5.1.4 exist at the facility shall not constitute a violation of Rule 4455 if the leaking components are repaired as soon as practicable but not later than the time frame specified in Rule 4455. Such components shall not be counted towards determination of compliance with the provisions of Section 5.1.4. [District Rule 4455, 5.1.3.2.1] Federally Enforceable Through Title V Permit

97. Leaking components detected during operator inspection pursuant Section 5.1.3.2.1 that are not repaired, replaced, or removed from operation as soon as practicable but not later than the time frame specified in Rule 4455 shall be counted toward determination of compliance with the provisions of Section 5.1.4. [District Rule 4455, 5.1.3.2.2] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

98. Any operator inspection conducted annually for a component type (including operator annual inspections pursuant to Section 5.2.5, 5.2.6, 5.2.7, or 5.2.8) that demonstrates one or more of the conditions in Section 5.1.4 exist at the facility shall constitute a violation of Rule 4455 regardless of whether or not the leaking components are repaired, replaced, or removed from operation within the allowable repair time frame specified in Rule 4455. [District Rule 4455, 5.1.3.2.3] Federally Enforceable Through Title V Permit

99. The operator shall audio-visually inspect for leaks all accessible operating pumps, compressors and Pressure Relief Devices (PRDs) in service at least once every 24 hours, except when operators do not report to the facility for that given 24 hours. Any identified leak that cannot be immediately repaired shall be reinspected within 24 hours using a portable analyzer. If a leak is found, it shall be repaired as soon as practical but not later than the time frame specified in Table 3. [District Rule 4455, 5.2.1 & 5.2.2] Federally Enforceable Through Title V Permit

100. The operator shall inspect all components at least once every calendar quarter, except for inaccessible components, unsafe-to-monitor components and pipes. Inaccessible components, unsafe-to-monitor components and pipes shall be inspected in accordance with the requirements set forth in Sections 5.2.5, 5.2.6, and 5.2.7. New, replaced, or repaired fittings, flanges and threaded connections shall be inspected immediately after being placed into service. Components shall be inspected using EPA Method 21. [District Rule 4455, 5.2.3, 5.2.4, 5.2.5, 5.2.6 & 5.2.7] Federally Enforceable Through Title V Permit

101. The operator may apply for a written approval from the APCO to change the inspection frequency from quarterly to annually for a component type, provided the operator meets all the criteria specified in Sections 5.2.8.1 through 5.2.8.3. This approval shall apply to accessible component types, specifically designated by the APCO, except pumps, compressors, and PRDs which shall continue to be inspected on a quarterly basis. [District Rule 4455, 5.2.8] Federally Enforceable Through Title V Permit

102. An annual inspection frequency approved by the APCO shall revert to quarterly inspection frequency for a component type if either the operator inspection or District inspection demonstrates that a violation of the provisions of Sections 5.1, 5.2 and 5.3 of the rule exists for that component type, or the APCO issued a Notice of Violation for violating any of the provisions of Rule 4455 during the annual inspection period for that component type. When the inspection frequency changes from annual to quarterly inspections, the operator shall notify the APCO in writing within five (5) calendar days after changing the inspection frequency, giving the reason(s) and date of change to quarterly inspection frequency. [District Rule 4455, 5.2.9 & 5.2.10] Federally Enforceable Through Title V Permit

103. The operator shall initially inspect a process PRD that releases to the atmosphere as soon as practicable but not later than 24 hours after the time of the release. To insure that the process PRD is operating properly, and is leak-free, the operator shall re-inspect the process PRD not earlier than 24 hours after the initial inspection but not later than 15 calendar days after the date of the release using EPA Method 21. If the process PRD is found to be leaking at either inspection, the PRD leak shall be treated as if the leak was found during quarterly operator inspections. [District Rule 4455, 5.2.11] Federally Enforceable Through Title V Permit

104. Except for process PRD, a component shall be inspected within 15 calendar days after repairing the leak or replacing the component using EPA Method 21. [District Rule 4455, 5.2.12] Federally Enforceable Through Title V Permit

105. Upon detection of a leaking component, the operator shall affix to that component a weatherproof readily visible tag that contains the information specified in Section 5.3.3. The tag shall remain affixed to the component until the leaking component has been repaired or replaced; has been re-inspected using EPA Method 21; and is found to be in compliance with the requirements of Rule 4455. [District Rule 4455, 5.3.1 5.3.2 and 5.3.3] Federally Enforceable Through Title V Permit

106. An operator shall minimize all component leaks immediately to the extent possible, but not later than one (1) hour after detection of leaks in order to stop or reduce leakage to the atmosphere. [District Rule 4455, 5.3.4] Federally Enforceable Through Title V Permit

107. If the leak has been minimized but the leak still exceeds the applicable leak standards of Rule 4455, an operator shall repair or replace the leaking component, vent the leaking component to a closed vent system, or remove the leaking component from operation as soon as practicable but not later than the time period specified in Table 3. For each calendar quarter, the operator may be allowed to extend the repair period as specified in Table 3, for a total number of leaking components, not to exceed 0.05 percent of the number of components inspected, by type, rounded upward to the nearest integer where required. [District Rule 4455, 5.3.5] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

108. If the leaking component is an essential component or a critical component and which cannot be immediately shut down for repairs, the operator shall minimize the leak within one hour after detection of the leak. If the leak has been minimized, but the leak still exceeds any of the applicable leak standards of Rule 4455, the essential component or critical component shall be repaired or replaced to eliminate the leak during the next process unit turnaround, but in no case later than one year from the date of the original leak detection, whichever comes earlier. [District Rule 4455 5.3.6] Federally Enforceable Through Title V Permit

109. For any component that has incurred five repair actions for major gas leaks or major liquid leaks, or any combination of major gas leaks and major liquid leaks within a continuous 12-month period, the operator shall comply with at least one of the requirements specified in Sections 5.3.7.1, 5.3.7.2, 5.3.7.3, or 5.3.7.4 by the applicable deadlines specified in Sections 5.3.7.5 and 5.3.7.6. If the original leaking component is replaced with a new like-in-kind component before incurring five repair actions for major leaks within 12-consecutive months, the repair count shall start over for the new component. An entire compressor or pump need not be replaced provided the compressor part(s) or pump part(s) that have incurred five repair actions as described in Section 5.3.7 are brought into compliance with at least one of the requirements of Sections 5.3.7.1 through 5.3.7.6. [District Rule4455, 5.3.7] Federally Enforceable Through Title V Permit

110. The operator shall monitor process PRD by using electronic process control instrumentation that allows for real time continuous parameter monitoring or by using telltale indicators for the process PRD where parameter monitoring is not feasible. This requirement applies only to any process PRD that is vented to atmosphere. [District Rule 4455, 5.4.1] Federally Enforceable Through Title V Permit

111. All major components and critical components shall be physically identified clearly and visibly for inspection, repair, and recordkeeping purposes. The physical identification shall consist of labels, tags, manufacturer's nameplate identifier, serial number, or model number, or other system approved by the APCO that enables an operator or District personnel to locate each individual component. The operator shall replace tags or labels that become missing or unreadable as soon as practicable but not later than 24 hours after discovery. The operator shall comply with the requirements of Sections 6.1.4 if there is any change in the description of major components or critical components. [District Rule 4455, 5.5.1 & 5.5.2] Federally Enforceable Through Title V Permit

112. The operator shall keep a copy of the operator management plan at the facility and make it available to the APCO, ARB and US EPA upon request. By January 30 of each year, the operator shall submit to the APCO for approval, in writing, an annual report indicating any changes to the existing, approved operator management plan. [District Rule 4455, 6.1.2 & 6.1.4] Federally Enforceable Through Title V Permit

113. The operator shall maintain an inspection log containing, at a minimum, 1) total number of components inspected, and total number and percentage of leaking components found by component types, 2) location, type, name or description of each leaking component, and description of any unit where the leaking component is found, 3) date of leak detection and method of leak detection, 4) for gaseous leaks, record the leak concentration in ppmv, and for liquid leaks record whether the leak is a major liquid leak or a minor liquid leak, 5) date of repair, replacement, or removal from operation of leaking components, 6) identification and location of essential component and critical components found leaking that cannot be repaired until the next process unit turnaround or not later one year after leak detection, whichever comes earlier, 7) methods used to minimize the leak from essential components and critical components that cannot be repaired until the next process unit turnaround or not later one year after leak detection, whichever comes earlier, 8) after the component is repaired or is replaced, the date of reinspection and the leak concentration in ppmv, 9) inspector's name, business mailing address, and business telephone number, and 10) the facility operator responsible for the inspection and repair program shall sign and date the inspection log certifying the accuracy of the information recorded in the log. [District Rule 4455, 6.2.1] Federally Enforceable Through Title V Permit

114. Records of each calibration of the portable hydrocarbon detection instrument utilized for inspecting components, including a copy of current calibration gas certification from the vendor of said calibration gas cylinder, the date of calibration, concentration of calibration gas, analyzer reading of calibration gas before adjustment, instrument reading of calibration gas after adjustment, calibration gas expiration date, and calibration gas cylinder pressure at the time of calibration. [District Rule 4455, 6.2.3] Federally Enforceable Through Title V Permit

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CONDITIONS CONTINUE ON NEXT PAGE

115. The operator shall notify the APCO, by telephone or other methods approved by the APCO, of any process PRD release described in Sections 5.4.4 and 5.4.5, and any release in excess of the reportable quantity limits as stipulated in 40 CFR, Part 117, Part 302 and Part 355, including any release in excess of 100 pounds of VOC, within one hour of such occurrence or within one hour of the time said person knew or reasonably should have known of its occurrence. This requirement applies only to any process PRD that is vented to atmosphere. [District Rule 4455, 6.3.1] Federally Enforceable Through Title V Permit

116. The operator shall submit a written report to the APCO within thirty (30) calendar days following a PRD release subject to 6.3.1. The written report shall include 1) process PRD type, size, and location, 2) date, time and duration of the process PRD release, 3) types of VOC released and individual amounts, in pounds, including supporting calculations, 4) cause of the process PRD release, and 5) corrective actions taken to prevent a subsequent process PRD release. This requirement applies only to any process PRD that is vented to atmosphere. [District Rule4455 6.3.2] Federally Enforceable Through Title V Permit

117. Copies of all records shall be retained for a minimum of five (5) years after the date of an entry. Such records shall be made available to the APCO, ARB, or US EPA upon request. [District Rule 4455, 6.2.2, 6.2.3 & 6.2.4] Federally Enforceable Through Title V Permit

118. Measurements of gaseous leak concentrations shall be conducted according to US EPA Method 21 using an appropriate portable hydrocarbon detection instrument calibrated with methane. The instrument shall be calibrated in accordance with the procedures specified in US EPA Method 21 or the manufacturer's instruction, as appropriate, not more than 30 days prior to its use. The operator shall record the calibration date of the instrument. [District Rule 4455, 6.4.1] Federally Enforceable Through Title V Permit

119. The VOC content shall be determined using American Society of Testing and Materials (ASTM) D 1945 for gases and South Coast Air Quality Management District (SCAQMD) Method 304-91 for liquids. [District Rule 4455, 6.4.2] Federally Enforceable Through Title V Permit

120. The percent by volume liquid evaporated at 150 C shall be determined using ASTM D 86. [District Rule 4455, 6.4.3] Federally Enforceable Through Title V Permit

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

PERMIT NO: S-33-409-0 **ISSUANCE DATE:** DRAFT

LEGAL OWNER OR OPERATOR: BIG WEST OF CA, LLC
MAILING ADDRESS: 6451 ROSEDALE HWY (AREA 1 & 2)
BAKERSFIELD, CA 93308

LOCATION: 6451 ROSEDALE HWY (AREA 1 & 2)
BAKERSFIELD, CA 93308

EQUIPMENT DESCRIPTION:
SOUR WATER AMMONIA TO AMMONIUM THIOSULFATE (SWAATS) UNIT

CONDITIONS

1. {1829} The facility shall submit an application to modify the Title V permit in accordance with the timeframes and procedures of District Rule 2520. [District Rule 2520] Federally Enforceable Through Title V Permit
2. {1830} This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District NSR Rule] Federally Enforceable Through Title V Permit
3. Permittee shall submit to the District final design details and engineering drawings for the reaction burner, catalytic oxidizer, combustion air delivery system, ammonium thiosulfate (ATS) contactor vessels, ATS storage vessels and SO2 scrubber. The permittee shall provide the total electric horsepower of all electrically powered equipment installed with this unit. All materials shall be provided at least 30 days prior to initiation of construction on this unit. [District Rule 2201] Federally Enforceable Through Title V Permit
4. At least 30 days prior to initial startup of this unit, the operator shall provide and have approved by the District a startup/shutdown plan. This plan shall list and describe the procedures required to complete the startup and shutdown of this unit, the required time for each procedure and the measures to be taken to minimize emissions during these periods. The plan shall be consistent with good engineering practices and shall be in keeping with the manufacturer's recommendations. [District Rule 2201] Federally Enforceable Through Title V Permit
5. During each startup and shutdown period, the emission control systems shall be in operation and emissions shall be minimized insofar as is technologically feasible. [District Rules 2201] Federally Enforceable Through Title V Permit
6. Total quantity of sulfur from ammonium thiosulfate solution (ATS) produced from this unit shall not exceed 92.2 tons per day. [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 326-6900 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director / APCO

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DAVID WARNER, Director of Permit Services

7. VOC content of the sour water stripper gas processed in this unit shall not exceed 10% by weight as determined in accordance with the latest revision of ASTM Methods S-168, E-169, or E-260. [District Rule 2201]

8. Operator shall conduct quarterly sampling of the VOC content of the sour water stripper gas supplied to this unit. If the sour water stripper gas VOC content is shown to be no greater than 10% by weight for 4 consecutive quarterly samplings, then subsequent sampling for VOC content shall be required annually. [District Rule 2201]

9. Except during periods of startup and shutdown, emission rates shall not exceed any of the following: SOx (as SO2): 30 ppmv @ 0% O2, CO: 100 ppmv @ 0% O2 and VOC: 1.36 lb/hr. [District Rule 2201] Federally Enforceable Through Title V Permit

10. Emission rates shall not exceed any of the following: SOx (as SO2): 44.2 lb/day, CO: 64.4 lb/day and VOC: 32.6. [District Rule 2201] Federally Enforceable Through Title V Permit

11. Prior to operating equipment under this Authority to Construct, permittee shall surrender emission reduction credits to offset the calendar quarter emissions increases set forth below, at the distance offset ratio specified in Rule 2201 (as amended 12/15/05) Table 4.2: SOx (as SO2) - Q1: 4,033 lb, Q2: 4,033 lb, Q3: 4,033 lb and Q4: 4,033 lb, CO - Q1: 5,877 lb, Q2: 5,877 lb, Q3: 5,877 lb and Q4: 5,877 lb and VOC - Q1: 2,975 lb, Q2: 2,975 lb, Q3: 2,975 lb and Q4: 2,975 lb. [District Rule 2201] Federally Enforceable Through Title V Permit

12. ERC Certificate Numbers S-2177-5 and/or S-2184-5 (or certificates split from these certificates) shall be used to supply the required SOx offsets, Certificate Number S-2178-3 (or a certificate split from this certificate) shall be used to supply the required CO offsets and ERC Certificate Number S-2452-1 (or a certificate split from this certificate) shall be used to supply the required VOC offsets, unless a revised offsetting proposal is received and approved by the District, upon which this Authority to Construct shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of this Authority to Construct. [District Rule 2201] Federally Enforceable Through Title V Permit

13. Compliance with SOx, CO and VOC emission limits shall be demonstrated within 120 days of initial operation and once every twelve months thereafter. Compliance demonstration shall be by District authorized in situ sampling of exhaust gases by a qualified independent source test firm at conditions representative of normal operation. [District Rules 2201] Federally Enforceable Through Title V Permit

14. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified 30 days prior to any compliance source test, and a source test plan must be submitted for approval 15 days prior to testing. [District Rule 1081] Federally Enforceable Through Title V Permit

15. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081] Federally Enforceable Through Title V Permit

16. Permittee shall install, calibrate, maintain, and continuously operate a pH monitoring system for the SO2 scrubber vent wash. [District Rule 2201] Federally Enforceable Through Title V Permit

17. During the initial compliance test for this unit, permittee shall establish the range of pH of values of the scrubber vent wash that correlates with SOx exhaust emissions that are less than or equal to the SOx emission concentration required by this permit. [District Rule 2201] Federally Enforceable Through Title V Permit

18. During the initial compliance test for this unit, permittee shall establish a correlation between the sulfur production rate for this unit and the daily emissions of SO2 from scrubber vent exhaust flow rate. [District Rule 2201] Federally Enforceable Through Title V Permit

19. The following test methods shall be used: SOx - EPA Method 6, 6C or CARB Method 100, CO and O2 - CARB Method 100 and VOC - EPA Method 18, 25A or 25B or CARB Method 100. EPA approved alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rules 1081and 2201] Federally Enforceable Through Title V Permit

20. All required source testing shall conform to the compliance testing procedures described in District Rule 1081(Last Amended December 19, 1993) and applicable District policies. [District Rule 1081, and Kern County Rule 108.1] Federally Enforceable Through Title V Permit

21. {588} Particulate matter emissions shall not exceed 0.1 grain/dscf, 0.1 grain/dscf calculated to 12% CO2, nor 10 lb/hr. [District Rules 4201, 3.1 and 4301, 5.1 and 5.2.3] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

22. Emissions of sulfur compounds from this unit shall not exceed 200 lb per hour, calculated as SO2. Operator shall demonstrate compliance with this requirement by annual source testing of exhaust. [District Rule 2520, 9.3.2 and District Rule 4301, 5.2.1] Federally Enforceable Through Title V Permit
23. The concentration of sulfur compounds in the exhaust from this unit shall not exceed 0.2% by volume as measured on a dry basis over a 15 minute period (Kern County Rule 407). Operator shall demonstrate compliance with this requirement by annual source testing exhaust. [District Rule 4801 and Kern County Rule 407] Federally Enforceable Through Title V Permit
24. The permittee shall maintain records of the duration of each startup period for this unit. [District Rules 2201] Federally Enforceable Through Title V Permit
25. The permittee shall maintain daily records of amounts of ATS and sulfur produced and the measured pH of the vent wash for this unit. [District Rules 2201] Federally Enforceable Through Title V Permit
26. {3246} All records shall be maintained and retained on-site for a period of at least 5 years and shall be made available for District inspection upon request. [District Rule 1070]
27. The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods. The sampling ports shall be located in accordance with the CARB regulation titled California Air Resources Board Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing. [District Rule 1081] Federally Enforceable Through Title V Permit
28. Each drain receiving refinery wastewater from a process unit shall be equipped with water seal controls. [40 CFR 60.692-2(a)(1)] Federally Enforceable Through Title V Permit
29. Each drain in active service, receiving refinery wastewater from a process unit, shall be checked by visual or physical inspection initially and monthly thereafter for indications of low water levels or other conditions that would reduce the effectiveness of the water seal controls. [40 CFR 60.692-2(a)(2)] Federally Enforceable Through Title V Permit

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

PERMIT NO: S-33-410-0 **ISSUANCE DATE:** DRAFT

LEGAL OWNER OR OPERATOR: BIG WEST OF CA, LLC
MAILING ADDRESS: 6451 ROSEDALE HWY (AREA 1 & 2)
BAKERSFIELD, CA 93308

LOCATION: 6451 ROSEDALE HWY (AREA 1 & 2)
BAKERSFIELD, CA 93308

EQUIPMENT DESCRIPTION:
FLUID CATALYTIC CRACKING UNIT (FCCU), WITH STARTUP HEATER HAVING A HEAT INPUT RATING NOT EXCEEDING 89 MM BTU/HR, SELECTIVE CATALYTIC REDUCTION AND PALL CORPORATION HIGH TEMPERATURE PARTICULATE FILTER

CONDITIONS

1. {1829} The facility shall submit an application to modify the Title V permit in accordance with the timeframes and procedures of District Rule 2520. [District Rule 2520] Federally Enforceable Through Title V Permit
2. {1830} This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District NSR Rule] Federally Enforceable Through Title V Permit
3. Permittee shall submit to the District final design details for this unit, including the burners selected for the start-up heater, the Pall Corp particulate filter, SCR emissions control system and continuous emission monitors required for this unit at least 30 days prior to initiation of construction on this unit. [District Rule 2201] Federally Enforceable Through Title V Permit
4. At least 30 days prior to initial startup of this unit, the operator shall provide and have approved by the District a startup/shutdown plan. This plan shall list and describe the procedures required to complete the startup and shutdown of this unit, the required time for each procedure and the measures to be taken to minimize emissions during these periods. At a minimum, the plan shall address the following: warm-up through the use of air blower, startup heater and torch oil, equilibrium catalyst loading, catalyst circulation, and introduction of feed into the unit. [District Rule 2201] Federally Enforceable Through Title V Permit
5. Ammonia injection grid shall be equipped with operational ammonia flowmeter and injection pressure indicator. [District Rule 2201] Federally Enforceable Through Title V Permit

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YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 326-6900 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

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DAVID WARNER, Director of Permit Services

6. Permittee shall monitor and record exhaust gas temperature at selective catalytic reduction catalyst inlet. [District Rule 2201] Federally Enforceable Through Title V Permit

7. Permittee shall maintain a daily record of quantity of the fresh feed supplied to this unit. [District Rule 2201] Federally Enforceable Through Title V Permit

8. Total heat input into startup heater shall not exceed 89 MMBtu/hr. [District Rule 2201] Federally Enforceable Through Title V Permit

9. Total sulfur content of fuel combusted in startup heater shall not exceed 40 ppmv (measured as H2S), based on a 4-hr rolling average . [District Rule 2201] Federally Enforceable Through Title V Permit

10. Except during startup and shutdown periods, emission rates shall not exceed any of the following: NOx (as NO2): NOx: 20 ppmv @ 0% O2 (365-day average) and 40 ppmv @ 0% O2 (7-day average), SOx: 20 ppmv @ 0% O2 (365-day average) and 50 ppmv @ 0% O2 (7-day average), PM10: 0.3 lb/1000 lbs of coke burned off and 5.55 lb/hr, CO: 50 ppmv @ 0% O2 (365-day average), 78 ppmv @ 0% O2 (7-day average) and 500 ppmv @ 0% O2 (1 hour average), VOC: 19 ppmv @ 0% O2 (measured as methane), or ammonia slip: 10 ppmv @ 0% O2. Compliance with VOC and ammonia slip emissions limits shall be demonstrated on a three hour rolling average basis. [District Rules 2201, 4305, 4306, 4351 and 40 CFR 60.102a(b)1),(2),(3) and (4)] Federally Enforceable Through Title V Permit

11. Emission rates shall not exceed any of the following: NOx (as NO2): 404.0 lb/day, SOx (as SO2): 703.1 lb/day, PM10: 133.2 lb/day, CO: 3074.5 lb/day, VOC: 66.7 lb/day (non-fugitive) and ammonia: 39.5 lb/day. [District Rule 2201] Federally Enforceable Through Title V Permit

12. Fugitive VOC emissions from components associated with this unit shall not exceed 39.4 lb/day. [District Rule 2201] Federally Enforceable Through Title V Permit

13. During each startup and shutdown period, the emission control systems shall be in operation and emissions shall be minimized insofar as is technologically feasible. [District Rules 2201] Federally Enforceable Through Title V Permit

14. The permittee shall maintain records of the duration of each startup and shutdown period for this unit. [District Rules 2201] Federally Enforceable Through Title V Permit

15. Prior to operating equipment under this Authority to Construct, permittee shall surrender emission reduction credits to offset the calendar quarter emissions increases set forth below, at the distance offset ratio specified in Rule 2201 (as amended 12/15/05) Table 4.2 and the interpollutant offset ratio specified in this permit, NOx (as NO2) - Q1: 18,537 lb, Q2: 18,537 lb, Q3: 18,537 lb, and Q4: 18,537 lb; SOx (as SO2) - Q1: 25,645 lb, Q2: 25,645 lb, Q3: 25,645 lb and Q4: 25,645 lb; PM10 - Q1: 12,162 lb, Q2: 12,162 lb, Q3: 12,162 lb and Q4: 12,162 lb; CO - Q1: 28,110 lb, Q2: 28,110 lb, Q3: 28,110 lb and Q4: 28,110 lb, and VOC - Q1: 9,690 lb, Q2: 9,690 lb, Q3: 9,690 lb and Q4: 9,690 lb. [District Rule 2201] Federally Enforceable Through Title V Permit

16. ERC Certificate Number S-2183-2 (or certificates split from this certificate) shall be used to supply the required NOx and PM10 offsets, ERC Certificate Number S-2178-3 (or a certificate split from this certificate) shall be used to supply the required CO offsets, ERC Certificate Number S-2452-1 (or a certificate split from this certificate) shall be used to supply the required VOC offsets and ERC Certificate Numbers S-2177-5 and/or S-2184-5 (or certificates split from these certificates) shall be used to supply the required SOx, unless a revised offsetting proposal is received and approved by the District, upon which this Authority to Construct shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of this Authority to Construct. [District Rule 2201] Federally Enforceable Through Title V Permit

17. NOx ERCs may be used to offset PM10 emission increases at a ratio of 2.16 lb NOx : 1 lb PM10. [District Rule 2201] Federally Enforceable Through Title V Permit

18. At least once per week for an initial period of six weeks, and thereafter, at least once every six months, permittee shall obtain and analyze a representative sample for total reduced sulfur of the fuel combusted in this unit. Samples shall be analysed using ASTM Test Method D6228-98, D4468-85 or D1072-06, or an alternative analytical method approved in advance by the APCO. [District Rule 2201] Federally Enforceable Through Title V Permit

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19. Exhaust duct downstream of the SCR unit shall be equipped with continuously recording opacity and oxygen (O2) monitors and continuously recording emissions monitors for SOx and CO. All monitors shall be installed, operated and maintained in accordance with Rule 4001 NSPS Subpart Ja - Standards of Performance for Petroleum Refineries for Which Construction, Reconstruction, or Modification Commenced After May 14, 2007. [District Rules 1080 and 4001 and 40 CFR 60.105a(e),(g)and (h)] Federally Enforceable Through Title V Permit

20. Exhaust duct downstream of the SCR unit shall be equipped with continuously recording emissions monitor for NOx. CEM shall be meet the requirements of 40 CFR Part 60. [District Rules 1080 and 40 CFR 60.105a(f)] Federally Enforceable Through Title V Permit

21. The facility shall install and maintain equipment, facilities, and systems compatible with the District's CEM data polling software system and shall make CEM data available to the District's automated polling system on a daily basis. [District Rule 1080] Federally Enforceable Through Title V Permit

22. Upon notice by the District that the facility's CEM system is not providing polling data, the facility may continue to operate without providing automated data for a maximum of 30 days per calendar year provided the CEM data is sent to the District by a District-approved alternative method. [District Rule 1080] Federally Enforceable Through Title V Permit

23. The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NOx, CO, and O2 analyzer during District inspections. The sampling ports shall be located in accordance with the CARB regulation titled California Air Resources Board Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing. [District Rule 1081] Federally Enforceable Through Title V Permit

24. The permittee shall demonstrate continuous compliance with the sulfur content limit of the fuel combusted in startup heater for this unit by calculation, as the product of the fuel H2S concentration and the ratio of total sulfur to H2S, based on the most recently conducted fuel sample analysis for total sulfur. The total sulfur of the fuel shall be calculated for each one hour H2S monitoring result, and the hourly fuel sulfur values shall be averaged over a rolling three hour period to determine compliance. [District Rule 2201] Federally Enforceable Through Title V Permit

25. Within 90 days of commencement of normal, continuous operation of this unit, operator shall inspect all components for leaks using a portable hydrocarbon detection instrument and the methods specified in Section 6.4.1 of Rule 4455, except for those components that are specifically exempted from the requirements of Rule 4455. [District Rule 2201] Federally Enforceable Through Title V Permit

26. Operator shall demonstrate compliance with fugitive VOC emissions limit of this permit within 60 days after the completion of the initial inspection of components and annually thereafter within 60 days after completion of the annual inspection of components required by Rule 4455. Compliance shall be demonstrated by calculation, using the correlation equations, zero default and 10,000 ppmv pegged factors set forth in the CAPCOA California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities, Table IV-3a, February 1999, and the average emission concentrations of total organic compounds measured for each component during all inspections conducted during the prior 365 day period. [District Rule 2201] Federally Enforceable Through Title V Permit

27. The permittee shall monitor and record the stack concentration of ammonia (NH3) at least once during each month in which a source test is not performed. NH3 monitoring shall be conducted utilizing Draeger tubes or a District approved equivalent method. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within one day of restarting the unit unless monitoring has been performed within the last month. [District Rule 4102]

28. The permittee shall maintain records of: (1) the date and time of ammonia (NH3) measurements, (2) the O2 concentration in percent by volume and the measured NH3 concentrations corrected to 3% O2, (3) the method of determining the NH3 emission concentration, and (4) a description of any corrective action taken to maintain the emissions at or below the acceptable levels. [District Rule 4102]

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29. Compliance with NOx, SOx, PM10, CO, VOC, ammonia slip and opacity emission limits shall be demonstrated within 60 days after achieving the maximum production rate at which the fluid catalytic cracking unit catalyst regenerator will be operated, or 180 days after initial startup, whichever comes first, and once every twelve months thereafter. Compliance demonstration shall be by District authorized in situ sampling of exhaust gases by a qualified independent source test firm at conditions representative of normal operation. [District Rules 2201 and 40 CFR 60.102, 40 CFR 60.103 and 40 CFR 60.104] Federally Enforceable Through Title V Permit

30. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified 30 days prior to any compliance source test, and a source test plan must be submitted for approval 15 days prior to testing. [District Rule 1081] Federally Enforceable Through Title V Permit

31. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081] Federally Enforceable Through Title V Permit

32. The following test methods shall be used: NOx EPA Method 7E or ARB Method 100; SOx EPA Method 6 or 6C; CO EPA method 10, 10B or ARB Method 100; O2 EPA Method 3, 3A, 3B or ARB Method 100; VOC EPA method 18 or 25; particulate matter or PM10 EPA Method 5 (front and back half), PM10 EPA Methods 201A and 202, and ammonia BAAQMD ST-1B. EPA approved alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rules 1081 and 4001 Subpart Ja] Federally Enforceable Through Title V Permit

33. Compliance demonstration shall be based on the arithmetic mean, pursuant to District Rule 1081(amended December 16, 1993), of 3 thirty-minute test runs for NOx and CO. [District Rule 2520, 9.3.2] Federally Enforceable Through Title V Permit

34. All required source testing shall conform to the compliance testing procedures described in District Rule 1081(Last Amended December 19, 1993). [District Rule 1081, and Kern County Rule 108.1] Federally Enforceable Through Title V Permit

35. {588} Particulate matter emissions shall not exceed 0.1 grain/dscf, 0.1 grain/dscf calculated to 12% CO2, nor 10 lb/hr. [District Rules 4201, 3.1 and 4301, 5.1 and 5.2.3] Federally Enforceable Through Title V Permit

36. Emissions of sulfur compounds from this unit shall not exceed 200 lb per hour, calculated as SO2. [District Rule 2520, 9.3.2 and District Rule 4301, 5.2.1] Federally Enforceable Through Title V Permit

37. If fuel analysis is used to demonstrate compliance with the conditions of this permit, the fuel higher heating value for each fuel shall be certified by third party fuel supplier or determined by: ASTM D 1826 or D 1945 in conjunction with ASTM D 3588 for gaseous fuels. [District Rule 2520, 9.3.2; 4305, 6.2.1; and 4351, 6.2.1] Federally Enforceable Through Title V Permit

38. The concentration of sulfur compounds in the exhaust from this unit shall not exceed 0.2% by volume as measured on a dry basis over a 15 minute period (Kern County Rule 407). [District Rule 4801 and Kern County Rule 407] Federally Enforceable Through Title V Permit

39. Nitrogen oxide (NOx) emissions shall not exceed 140 lb/hr, calculated as NO2. [District Rules 4301, 5.2.2] Federally Enforceable Through Title V Permit

40. Operators shall not depressurize any vessel containing VOCs unless the process unit turnaround is accomplished by employing one of the following operating procedures: The organic vapors shall either be recovered, added to the refinery fuel gas system and combusted; or controlled and piped to an appropriate firebox or incinerated for combustion; or flared, until the pressure within the process vessel is as close to atmospheric pressure as is possible. All process vessels shall be depressurized into the control facilities to less than 1020 mm Hg (5 psig) before venting/opening to atmosphere. All organic compounds which emerge from a refinery process vessel during the purging of said vessel and which otherwise would be emitted to the atmosphere shall be either directed to a flare or incinerator or shall be used for fuel until such disposition of emissions is not technically feasible or is less safe than atmospheric venting. [District Rule 4454, 4.0] Federally Enforceable Through Title V Permit

41. No air contaminant shall be discharged into the atmosphere from the fluid catalytic cracking unit catalyst regenerator for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101] Federally Enforceable Through Title V Permit

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42. Each owner or operator subject to 40 CFR 60.102a shall satisfy all applicable notification and reporting requirements set forth in 40 CFR 60.108a(a),(b),(c)and(d). [40 CFR 60.108a(a),(b),(c)and(d)] Federally Enforceable Through Title V Permit

43. The owner or operator shall submit the reports required under this subpart to the District semiannually for each six-month period. All semiannual reports shall be postmarked by the 30th day following the end of each six-month period. The owner or operator shall submit a signed statement certifying the accuracy and completeness of the information contained in the report. [40 CFR 60 .7(c) and 60.108a(d)(7)] Federally Enforceable Through Title V Permit

44. The owner or operator shall submit semiannual Excess Emission Reports, prepared in accordance with 40 CFR 60.7(c) and (d). [40 CFR 60.7] Federally Enforceable Through Title V Permit

45. The operator shall not burn in any fuel gas combustion device any fuel that contains hydrogen sulfide (H2S) in excess of 162 ppmv determined hourly on a 3 hour rolling average basis and H2S in excess of 60 ppmv determined daily on a 365 successive calendar day rolling average basis. [40 CFR 60.102a(g)(1)(ii)] Federally Enforceable Through Title V Permit

46. A continuous emissions monitoring system for fuel gas H2S shall be installed, calibrated, operated, and reported according to EPA guidelines as specified under 40 CFR 60.107a(a)(2). CEM results shall be calculated on a rolling three (3) hour basis. [40 CFR 60, 60.107a(a)(2)] Federally Enforceable Through Title V Permit

47. Operator shall report all rolling 3-hour periods during which the average concentration of H2S as measured by the H2S continuous monitoring system exceeds 162 ppmv and all rolling 365-day periods during which the average concentration of H2S as measured by the H2S continuous monitoring system exceeds 60 ppmv. [40 CFR 60.107a(f)] Federally Enforceable Through Title V Permit

48. Operator shall determine compliance with the H2S standard using EPA Methods 11, 15, 15A, or 16. [40 CFR 60.106(e)] Federally Enforceable Through Title V Permit

49. The owner or operator shall comply with the requirements 40 CFR 60.482-1 to 40 CFR 60.482-10 as soon as practical, but no later than 180 days after initial start. [40 CFR 60.592(a)] Federally Enforceable Through Title V Permit

50. Each pump in light liquid service (PLLS) shall be monitored monthly to detect leaks by the methods specified in 40 CFR 60.485(b), except as provided in 40 CFR 60.482-1(c) and 40 CFR 60.482-2(d), (e), and (f). Each pump in light liquid service shall be checked by visual inspection each calendar week for indications of liquids dripping from the pump seal. A leak is detected if an instrument reading of 10,000 ppm or greater is measured or if there are indications of liquids dripping from the pump seal. [40 CFR 60.482-2(a) and (b)] Federally Enforceable Through Title V Permit

51. When a leak is detected for each PLLS, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in 40 CFR 60.482-9. A first attempt at repair shall be made no later than 5 calendar days after each leak is detected. [40 CFR 60.482-2(c)] Federally Enforceable Through Title V Permit

52. Each PLLS equipped with a dual mechanical seal system that includes a barrier fluid system is exempt from the requirements of 40 CFR 60.482-2(a) provided the requirements specified in 40 CFR 60.482-2(d)(1) through (6) are met. [40 CFR 60.482(d)] Federally Enforceable Through Title V Permit

53. Any PLLS that is designated, as described in 40 CFR 60.486(e)(1) and (2), for no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, is exempt from the requirements of 40 CFR 60.482-2(a), (c), and (d) if the pump meets the requirements specified in 40 CFR 60.482-2(e)(1), (2), and (3). [40 CFR 60.482-2(e)] Federally Enforceable Through Title V Permit

54. If any PLLS is equipped with a closed vent system capable of capturing and transporting leakage from the seal or seals to a control device that complies with the requirements of 40 CFR 60.482-10, it is exempt from the requirements of 40 CFR 60.482-2(a) through (e). [40 CFR 60.482-2(f)] Federally Enforceable Through Title V Permit

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55. Any pump in PLLS that is designated, as described in 40 CFR 60.486(f)(1), as an unsafe-to-monitor pump is exempt from the monitoring and inspection requirements of 40 CFR 60.482-2(a) and 40 CFR 60.482-2(d)(4) through (6) if: 1). The owner or operator of the pump demonstrates that the pump is unsafe-to-monitor because monitoring personnel would be exposed to an immediate danger as a consequence of complying with 40 CFR 60.482-2(a); and 2) The owner or operator of the pump has a written plan that requires monitoring of the pump as frequently as practicable during safe-to-monitor times but not more frequently than the periodic monitoring schedule otherwise applicable, and repair of the equipment according to the procedures in 40 CFR 60.482-2(c) if a leak is detected. [40 CFR 60.482-2(g)] Federally Enforceable Through Title V Permit

56. Pressure relief devices shall be vented to the refinery flare gas recovery system. [40 CFR 60.482-4(c)] Federally Enforceable Through Title V Permit

57. Except for in-situ sampling systems and sampling systems without purges, each sampling connection system shall be equipped with a closed-purge, closed-loop, or closed-vent system, except as provided in 40 CFR 60.482-1(c). Each closed-purge, closed-loop, or closed-vent system shall comply with the requirements specified in 40 CFR 60.482-5(b)(1), (2), (3), and (4). [40 CFR 60.482-5(a), (b), and (c)] Federally Enforceable Through Title V Permit

58. Each open-ended valve or line shall be equipped with a cap, blind flange, plug, or a second valve, except as provided in 40 CFR 60.482-1(c). The cap, blind flange, plug, or second valve shall seal the open end at all times except during operations requiring process fluid flow through the open-ended valve or line. When a double block-and-bleed system is being used, the bleed valve or line may remain open during operations that require venting the line between the block valves but shall comply with this condition at all other times. [40 CFR 60.482-6(a) and (c)] Federally Enforceable Through Title V Permit

59. Each open-ended valve or line equipped with a second valve shall be operated in a manner such that the valve on the process fluid end is closed before the second valve is closed. [40 CFR 60.482-6(b)] Federally Enforceable Through Title V Permit

60. Each valve in gas/vapor service and in light liquid service shall be monitored monthly to detect leaks by the methods specified in 40 CFR 60.485(b) and shall comply with 40 CFR 60.482-7(b) through (e), except as provided in 40 CFR 60.482-7(f), (g), and (h), 40 CFR 60.483-1, 40 CFR 60.483-2, and 40 CFR 60.482-1(c). A leak is detected if an instrument reading of 10,000 ppm or greater is measured. [40 CFR 60.482-7(a) and (b)] Federally Enforceable Through Title V Permit

61. Any valve in gas/vapor service or in light liquid service for which a leak is not detected for 2 successive months may be monitored the first month of every quarter, beginning with the next quarter, until a leak is detected. If a leak is detected, the valve shall be monitored monthly until a leak is not detected for 2 successive months. [40 CFR 60.482-7(c)] Federally Enforceable Through Title V Permit

62. When a leak is detected for any valve in gas/vapor service or in light liquid service, it shall be repaired as soon as practicable, but no later than 15 calendar days after the leak is detected, except as provided in 40 CFR 60.482-9. A first attempt at repair shall be made no later than 5 calendar days after each leak is detected. First attempts at repair include, but are not limited to, the best practices specified in 40 CFR 60.482-7(e)(1), (2), (3), and (4), where practicable. [40 CFR 60.482-7(d) and (e)] Federally Enforceable Through Title V Permit

63. If evidence of a potential leak is found by visual, audible, olfactory, or any other detection method at pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and connectors, the owner or operator shall follow either one of the following procedures: 1) The owner or operator shall monitor the equipment within 5 days by the method specified in 40 CFR 60.485(b) and shall comply with the requirements of 40 CFR 60.482-8(b) through (d); or 2) The owner or operator shall eliminate the visual, audible, olfactory, or other indication of a potential leak. A leak is detected if an instrument reading of 10,000 ppm or greater is measured. [40 CFR 60.482-8(a) and (b)] Federally Enforceable Through Title V Permit

64. When a leak is detected in pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and connectors, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in 40 CFR 60.482-9. The first attempt at repair shall be made no later than 5 calendar days after each leak is detected. First attempts at repair include, but are not limited to, the best practices described under 40 CFR 60.482-7(e). [40 CFR 60.482-8(c) and (d)] Federally Enforceable Through Title V Permit

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65. Except as provided in 40 CFR 60.482-10(i) through (k), each closed vent system used to comply with the provisions of Subpart GGG shall be inspected according to the procedures and schedule specified in 40 CFR 60.482-10(f)(1) and (f)(2). Leaks, as indicated by an instrument reading greater than 500 parts per million by volume above background or by visual inspections, shall be repaired as soon as practicable except as provided in 40 CFR 60.482-10(h). A first attempt at repair shall be made no later than 5 calendar days after the leak is detected. Repair shall be completed no later than 15 calendar days after the leak is detected. [40 CFR 60.482-10(f) and (g)] Federally Enforceable Through Title V Permit

66. Delay of repair of a closed vent system for which leaks have been detected is allowed if the repair is technically infeasible without a process unit shutdown or if the owner or operator determines that emissions resulting from immediate repair would be greater than the fugitive emissions likely to result from delay of repair. Repair of such equipment shall be complete by the end of the next process unit shutdown. [40 CFR 60.482-10(h)] Federally Enforceable Through Title V Permit

67. The owner or operator shall record the following information: 1) Identification of all parts of the closed vent system that are designated as unsafe to inspect, an explanation of why the equipment is unsafe to inspect, and the plan for inspecting the equipment; 2) Identification of all parts of the closed vent system that are designated as difficult to inspect, an explanation of why the equipment is difficult to inspect, and the plan for inspecting the equipment; 3) For each inspection during which a leak is detected, a record of the information specified in 40 CFR 60.486(c); 4) For each inspection conducted in accordance with 40 CFR 60.485(b) during which no leaks are detected, a record that the inspection was performed, the date of the inspection, and a statement that no leaks were detected; and 5) For each visual inspection conducted in accordance with 40 CFR 60.482-10(f)(1)(ii) during which no leaks are detected, a record that the inspection was performed, the date of the inspection, and a statement that no leaks were detected. [40 CFR 60.482-10(l)] Federally Enforceable Through Title V Permit

68. Closed vent systems and control devices used to comply with provisions Subpart GGG shall be operated at all times when emissions may be vented to them. [40 CFR 60.482-10(m)] Federally Enforceable Through Title V Permit

69. In conducting the performance tests required in 40 CFR 60.8, the owner or operator shall use as reference methods and procedures the test methods in 40 CFR 60, Appendix A or other methods and procedures as specified in 40 CFR 60.485, except as provided in 40 CFR 60.8(b). [40 CFR 60.485(a)] Federally Enforceable Through Title V Permit

70. The owner or operator shall determine compliance with the standards in 40 CFR 60.482, 60.483, and 60.484 as follows: Method 21 shall be used to determine the presence of leaking sources. The instrument shall be calibrated before use each day of its use by the procedures specified in Method 21. The following calibration gases shall be used: (i) Zero air (less than 10 ppm of hydrocarbon in air); and (ii) A mixture of methane or n-hexane and air at a concentration of about, but less than, 10,000 ppm methane or n-hexane. [40 CFR 60.485(b)] Federally Enforceable Through Title V Permit

71. The owner or operator shall determine compliance with the no detectable emission standards in 40 CFR 60.482-2(e), 60.482-3(i), 60.482-4, 60.482-7(f), and 60.482-10(e) as follows: 1) The requirements of 40 CFR 60.485(b) shall apply. 2) Method 21 shall be used to determine the background level. All potential leak interfaces shall be traversed as close to the interface as possible. The arithmetic difference between the maximum concentration indicated by the instrument and the background level is compared with 500 ppm for determining compliance. [40 CFR 60.485(c)] Federally Enforceable Through Title V Permit

72. The owner or operator shall test each piece of equipment unless demonstrated that a process unit is not in VOC service, i.e., that the VOC content would never be reasonably expected to exceed 10 percent by weight. For purposes of this demonstration, the following methods and procedures shall be used: 1) Procedures that conform to the general methods in ASTM E260-73, 91, or 96, E168-67, 77, or 92, E169-63, 77, or 93 (incorporated by reference as seen in 40 CFR 60.17) shall be used to determine the percent VOC content in the process fluid that is contained in or contacts a piece of equipment; 2) Organic compounds that are considered by the Administrator to have negligible photochemical reactivity may be excluded from the total quantity of organic compounds in determining the VOC content of the process fluid; and 3) Engineering judgment may be used to estimate the VOC content, if a piece of equipment had not been shown previously to be in service. If the Administrator disagrees with the judgment, the previous two procedures as specified in 40 CFR 60.485(d)(1) and (2) shall be used to resolve the disagreement. [40 CFR 60.485(d)] Federally Enforceable Through Title V Permit

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73. The owner or operator shall demonstrate that an equipment is in light liquid service by showing that all the following conditions apply: 1) The vapor pressure of one or more of the components is greater than 0.3 kPa at 20 °C (1.2 in. $H2O$ at 68 degrees F). Standard reference texts or ASTM D2879-83, 96, or 97 (incorporated by reference as seen in 40 CFR 60.17) shall be used to determine the vapor pressures; 2) The total concentration of the pure components having a vapor pressure greater than 0.3 kPa at 20 degrees Celsius is equal to or greater than 20 percent by weight; and 3) The fluid is a liquid at operating conditions. [40 CFR 60.485(e)] Federally Enforceable Through Title V Permit

74. Samples used in conjunction with 40 CFR 60.485(d), (e), and (g) shall be representative of the process fluid that is contained in or contacts the equipment or the gas being combusted in the flare. [40 CFR 60.485(f)] Federally Enforceable Through Title V Permit

75. An owner or operator of more than one affected facility subject to the provisions Subpart GGG may comply with the recordkeeping requirements for these facilities in one recordkeeping system if the system identifies each record by each facility. [40 CFR 60.486(a)] Federally Enforceable Through Title V Permit

76. When each leak is detected as specified in 40 CFR 60.482-2, 60.482-3, 60.482-7, 60.482-8, and 60.483-2, the following requirements apply: 1) A weatherproof and readily visible identification, marked with the equipment identification number, shall be attached to the leaking equipment; 2) The identification on a valve may be removed after it has been monitored for 2 successive months as specified in 40 CFR 60.482-7(c) and no leak has been detected during those 2 months; and 3) The identification on equipment except on a valve, may be removed after it has been repaired. [40 CFR 60.486(b)] Federally Enforceable Through Title V Permit

77. When each leak is detected as specified in 40 CFR 60.482-2, 60.482-3, 60.482-7, 60.482-8, and 60.483-2, the following information shall be recorded in a log and shall be kept for 5 years in a readily accessible location: 1) The instrument and operator identification numbers and the equipment identification number; 2) The date the leak was detected and the dates of each attempt to repair the leak; 3) Repair methods applied in each attempt to repair the leak; 4) ``Above 10,000" if the maximum instrument reading measured by the methods specified in 40 CFR 60.485(a) after each repair attempt is equal to or greater than 10,000 ppm; 5) ``Repair delayed" and the reason for the delay if a leak is not repaired within 15 calendar days after discovery of the leak; 6) The signature of the owner or operator (or designate) whose decision it was that repair could not be effected without a process shutdown; 7) The expected date of successful repair of the leak if a leak is not repaired within 15 days; 8) Dates of process unit shutdown that occur while the equipment is unrepaired; and 9) The date of successful repair of the leak. [40 CFR 60.486(c) and District Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit

78. The following information pertaining to the design requirements for closed vent systems and control devices described in 40 CFR 60.482-10 shall be recorded and kept in a readily accessible location: 1) Detailed schematics, design specifications, and piping and instrumentation diagrams; 2) The dates and descriptions of any changes in the design specifications; 3) A description of the parameter or parameters monitored, as required in 40 CFR 60.482-10(e), to ensure that control devices are operated and maintained in conformance with their design and an explanation of why that parameter (or parameters) was selected for the monitoring; 4) Periods when the closed vent systems and control devices required in 40 CFR 60.482-2, 60.482-3, 60.482-4, and 60.482-5 are not operated as designed, including periods when a flare pilot light does not have a flame; and 5) Dates of startups and shutdowns of the closed vent systems and control devices required in 40 CFR 60.482-2, 60.482-3, 60.482-4, and 60.482-5. [40 CFR 60.486(d)] Federally Enforceable Through Title V Permit

79. The following information pertaining to all equipment subject to the requirements in 40 CFR 60.482-1 to 60.482-10 shall be recorded in a log that is kept in a readily accessible location: 1) A list of identification numbers for equipment subject to the requirements of Subpart GGG; 2) (i) A list of identification numbers for equipment that are designated for no detectable emissions under the provisions of 40 CFR 60.482-2(e), 60.482-3(i) and 60.482-7(f). (ii) The designation of equipment as subject to the requirements of 40 CFR 60.482-2(e), 60.482-3(i) and 60.482-7(f) shall be signed by the owner or operator; 3) A list of equipment identification numbers for pressure relief devices required to comply with §60.482-4; 4) (i) The dates of each compliance test as required in 40 CFR 60.482-2(e), 60.482-3(i), §60.482-4, and 60.482-7(f). (ii) The background level measured during each compliance test. (iii) The maximum instrument reading measured at the equipment during each compliance test; and 5) A list of identification numbers for equipment in vacuum service. [40 CFR 60.486(e)] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

80. The following information pertaining to all valves subject to the requirements of 40 CFR 60.482-7(g) and (h) and to all pumps subject to the requirements of 40 CFR 60.482-2(g) shall be recorded in a log that is kept in a readily accessible location: 1) A list of identification numbers for valves and pumps that are designated as unsafe-to-monitor, an explanation for each valve or pump stating why the valve or pump is unsafe-to-monitor, and the plan for monitoring each valve or pump; and 2) A list of identification numbers for valves that are designated as difficult-to-monitor, an explanation for each valve stating why the valve is difficult-to-monitor, and the schedule for monitoring each valve. [40 CFR 60.486(f)] Federally Enforceable Through Title V Permit

81. The following information shall be recorded for valves complying with 40 CFR 60.483-2: 1) A schedule of monitoring; 2) The percent of valves found leaking during each monitoring period. [40 CFR 60.486(g)] Federally Enforceable Through Title V Permit

82. The following information shall be recorded in a log that is kept in a readily accessible location: 1) Design criterion required in 40 CFR 60.482-2(d)(5) and 60.482-3(e)(2) and explanation of the design criterion; and 2) Any changes to this criterion and the reasons for the changes. [40 CFR 60.486(h)] Federally Enforceable Through Title V Permit

83. The following information shall be recorded in a log that is kept in a readily accessible location for use in determining exemptions as provided in 40 CFR 60.480(d): 1) An analysis demonstrating the design capacity of the affected facility; 2) A statement listing the feed or raw materials and products from the affected facilities and an analysis demonstrating whether these chemicals are heavy liquids or beverage alcohol; and 3) An analysis demonstrating that equipment is not in VOC service. [40 CFR 60.486(i)] Federally Enforceable Through Title V Permit

84. Information and data used to demonstrate that a piece of equipment is not in VOC service shall be recorded in a log that is kept in a readily accessible location. [40 CFR 60.486(j)] Federally Enforceable Through Title V Permit

85. All semiannual reports to the Administrator shall include the following information, summarized from the information in 40 CFR 60.486: 1) Process unit identification; 2) For each month during the semiannual reporting period, i) Number of valves for which leaks were detected as described in 40 CFR 60.482-7(b) or 40 CFR 60.483-2, (ii) Number of valves for which leaks were not repaired as required in 40 CFR 60.482-7(d)(1), (iii) Number of pumps for which leaks were detected as described in 40 CFR 60.482-2(b) and (d)(6)(i), (iv) Number of pumps for which leaks were not repaired as required in 40 CFR 60.482-2(c)(1) and (d)(6)(ii), (v) Number of compressors for which leaks were detected as described in 40 CFR 60.482-3(f), (vi) Number of compressors for which leaks were not repaired as required in 40 CFR 60.482-3(g)(1), and (vii) The facts that explain each delay of repair and, where appropriate, why a process unit shutdown was technically infeasible; 3) Dates of process unit shutdowns which occurred within the semiannual reporting period; 4) Revisions to items reported in the semiannual report if changes have occurred since the initial report, as required in 40 CFR 60.487 (a) and (b), or subsequent revisions to the initial report. [40 CFR 60.487(c)] Federally Enforceable Through Title V Permit

86. An owner or operator electing to comply with the provisions of 40 CFR 60.483-1 and 60.483-2 shall notify the Administrator of the alternative standard selected 90 days before implementing either of the provisions. [40 CFR 60.487(d)] Federally Enforceable Through Title V Permit

87. An owner or operator shall report the results of all performance tests in accordance with 40 CFR 60.8 of the General Provisions. The provisions of 40 CFR 60.8(d) do not apply to affected facilities subject to the provisions of Subpart GGG except that an owner or operator must notify the Administrator of the schedule for the initial performance tests at least 30 days before the initial performance tests. [40 CFR 60.487(e)] Federally Enforceable Through Title V Permit

88. The operator shall maintain all records of required monitoring data and support information for inspection at any time for a period of five years. [District Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit

89. Each drain receiving refinery wastewater from a process unit shall be equipped with water seal controls. [40 CFR 60.692-2(a)(1)] Federally Enforceable Through Title V Permit

90. Each drain in active service, receiving refinery wastewater from a process unit, shall be checked by visual or physical inspection initially and monthly thereafter for indications of low water levels or other conditions that would reduce the effectiveness of the water seal controls. [40 CFR 60.692-2(a)(2)] Federally Enforceable Through Title V Permit

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91. A component shall be considered leaking if one or more of the conditions specified in Sections 5.1.4.1 through 5.1.4.4 of Rule 4455 exist at the facility. For this permit unit, except for pumps and compressors, a minor gas leak shall be defined for any component listed in Rule 4455 Section 3.22 Table 1 in either liquid or gas/vapor service as a reading in excess of 100 ppmv above background up to and including a reading of 10,000 ppmv above background. For pumps, compressors and other component types not specifically listed in Rule 4455 Section 3.22 Table 1 in either liquid or gas/vapor service, a minor gas leak shall be defined as a reading in excess of 500 ppmv above background up to and including a reading of 10,000 ppmv above background. Readings shall be taken as methane using a portable hydrocarbon detection instrument and shall be made in accordance with the methods specified in Section 6.4.1 of Rule 4455. [District Rules 2201and 4455, 5.1.4] Federally Enforceable Through Title V Permit

92. The operator shall not use any component that leaks in excess of the allowable leak standards of Rule 4455, or is found to be in violation of the provisions specified in Section 5.1.3. A component identified as leaking in excess of an allowable leak standard may be used provided it has been identified with a tag for repair, has been repaired, or is awaiting re-inspection after repair, within the applicable time period specified within the rule. [District Rule Rule 4455, 5.1.1] Federally Enforceable Through Title V Permit

93. Each hatch shall be closed at all times except during sampling or adding of process material through the hatch, or during attended repair, replacement, or maintenance operations, provided such activities are done as expeditiously as possible and with minimal spillage of material and VOC emissions to the atmosphere. [District Rule 4455, 5.1.2] Federally Enforceable Through Title V Permit

94. The operator shall be in violation of Rule 4455 if any District inspection demonstrates that one or more of the conditions in Sections 5.1.4 exist at the facility. [District Rule 4455, 5.1.3.1] Federally Enforceable Through Title V Permit

95. Except for annual operator inspection described in Section 5.1.3.2.3, any operator inspection that demonstrates one or more of the conditions in Section 5.1.4 exist at the facility shall not constitute a violation of Rule 4455 if the leaking components are repaired as soon as practicable but not later than the time frame specified in Rule 4455. Such components shall not be counted towards determination of compliance with the provisions of Section 5.1.4. [District Rule 4455, 5.1.3.2.1] Federally Enforceable Through Title V Permit

96. Leaking components detected during operator inspection pursuant Section 5.1.3.2.1 that are not repaired, replaced, or removed from operation as soon as practicable but not later than the time frame specified in Rule 4455 shall be counted toward determination of compliance with the provisions of Section 5.1.4. [District Rule 4455, 5.1.3.2.2] Federally Enforceable Through Title V Permit

97. Any operator inspection conducted annually for a component type (including operator annual inspections pursuant to Section 5.2.5, 5.2.6, 5.2.7, or 5.2.8) that demonstrates one or more of the conditions in Section 5.1.4 exist at the facility shall constitute a violation of Rule 4455 regardless of whether or not the leaking components are repaired, replaced, or removed from operation within the allowable repair time frame specified in Rule 4455. [District Rule 4455, 5.1.3.2.3] Federally Enforceable Through Title V Permit

98. The operator shall audio-visually inspect for leaks all accessible operating pumps, compressors and Pressure Relief Devices (PRDs) in service at least once every 24 hours, except when operators do not report to the facility for that given 24 hours. Any identified leak that cannot be immediately repaired shall be reinspected within 24 hours using a portable analyzer. If a leak is found, it shall be repaired as soon as practical but not later than the time frame specified in Table 3. [District Rule 4455, 5.2.1 & 5.2.2] Federally Enforceable Through Title V Permit

99. The operator shall inspect all components at least once every calendar quarter, except for inaccessible components, unsafe-to-monitor components and pipes. Inaccessible components, unsafe-to-monitor components and pipes shall be inspected in accordance with the requirements set forth in Sections 5.2.5, 5.2.6, and 5.2.7. New, replaced, or repaired fittings, flanges and threaded connections shall be inspected immediately after being placed into service. Components shall be inspected using EPA Method 21. [District Rule 4455, 5.2.3, 5.2.4, 5.2.5, 5.2.6 & 5.2.7] Federally Enforceable Through Title V Permit

100. The operator may apply for a written approval from the APCO to change the inspection frequency from quarterly to annually for a component type, provided the operator meets all the criteria specified in Sections 5.2.8.1 through 5.2.8.3. This approval shall apply to accessible component types, specifically designated by the APCO, except pumps, compressors, and PRDs which shall continue to be inspected on a quarterly basis. [District Rule 4455, 5.2.8] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

101. An annual inspection frequency approved by the APCO shall revert to quarterly inspection frequency for a component type if either the operator inspection or District inspection demonstrates that a violation of the provisions of Sections 5.1, 5.2 and 5.3 of the rule exists for that component type, or the APCO issued a Notice of Violation for violating any of the provisions of Rule 4455 during the annual inspection period for that component type. When the inspection frequency changes from annual to quarterly inspections, the operator shall notify the APCO in writing within five (5) calendar days after changing the inspection frequency, giving the reason(s) and date of change to quarterly inspection frequency. [District Rule 4455, 5.2.9 & 5.2.10] Federally Enforceable Through Title V Permit

102. The operator shall initially inspect a process PRD that releases to the atmosphere as soon as practicable but not later than 24 hours after the time of the release. To insure that the process PRD is operating properly, and is leak-free, the operator shall re-inspect the process PRD not earlier than 24 hours after the initial inspection but not later than 15 calendar days after the date of the release using EPA Method 21. If the process PRD is found to be leaking at either inspection, the PRD leak shall be treated as if the leak was found during quarterly operator inspections. [District Rule 4455, 5.2.11] Federally Enforceable Through Title V Permit

103. Except for process PRD, a component shall be inspected within 15 calendar days after repairing the leak or replacing the component using EPA Method 21. [District Rule 4455, 5.2.12] Federally Enforceable Through Title V Permit

104. Upon detection of a leaking component, the operator shall affix to that component a weatherproof readily visible tag that contains the information specified in Section 5.3.3. The tag shall remain affixed to the component until the leaking component has been repaired or replaced; has been re-inspected using EPA Method 21; and is found to be in compliance with the requirements of Rule 4455. [District Rule 4455, 5.3.1 5.3.2 and 5.3.3] Federally Enforceable Through Title V Permit

105. An operator shall minimize all component leaks immediately to the extent possible, but not later than one (1) hour after detection of leaks in order to stop or reduce leakage to the atmosphere. [District Rule 4455, 5.3.4] Federally Enforceable Through Title V Permit

106. If the leak has been minimized but the leak still exceeds the applicable leak standards of Rule 4455, an operator shall repair or replace the leaking component, vent the leaking component to a closed vent system, or remove the leaking component from operation as soon as practicable but not later than the time period specified in Table 3. For each calendar quarter, the operator may be allowed to extend the repair period as specified in Table 3, for a total number of leaking components, not to exceed 0.05 percent of the number of components inspected, by type, rounded upward to the nearest integer where required. [District Rule 4455, 5.3.5] Federally Enforceable Through Title V Permit

107. If the leaking component is an essential component or a critical component and which cannot be immediately shut down for repairs, the operator shall minimize the leak within one hour after detection of the leak. If the leak has been minimized, but the leak still exceeds any of the applicable leak standards of Rule 4455, the essential component or critical component shall be repaired or replaced to eliminate the leak during the next process unit turnaround, but in no case later than one year from the date of the original leak detection, whichever comes earlier. [District Rule 4455 5.3.6] Federally Enforceable Through Title V Permit

108. For any component that has incurred five repair actions for major gas leaks or major liquid leaks, or any combination of major gas leaks and major liquid leaks within a continuous 12-month period, the operator shall comply with at least one of the requirements specified in Sections 5.3.7.1, 5.3.7.2, 5.3.7.3, or 5.3.7.4 by the applicable deadlines specified in Sections 5.3.7.5 and 5.3.7.6. If the original leaking component is replaced with a new like-in-kind component before incurring five repair actions for major leaks within 12-consecutive months, the repair count shall start over for the new component. An entire compressor or pump need not be replaced provided the compressor part(s) or pump part(s) that have incurred five repair actions as described in Section 5.3.7 are brought into compliance with at least one of the requirements of Sections 5.3.7.1 through 5.3.7.6. [District Rule4455, 5.3.7] Federally Enforceable Through Title V Permit

109. The operator shall monitor process PRD by using electronic process control instrumentation that allows for real time continuous parameter monitoring or by using telltale indicators for the process PRD where parameter monitoring is not feasible. This requirement applies only to any process PRD that is vented to atmosphere. [District Rule 4455, 5.4.1] Federally Enforceable Through Title V Permit

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110. All major components and critical components shall be physically identified clearly and visibly for inspection, repair, and recordkeeping purposes. The physical identification shall consist of labels, tags, manufacturer's nameplate identifier, serial number, or model number, or other system approved by the APCO that enables an operator or District personnel to locate each individual component. The operator shall replace tags or labels that become missing or unreadable as soon as practicable but not later than 24 hours after discovery. The operator shall comply with the requirements of Sections 6.1.4 if there is any change in the description of major components or critical components. [District Rule 4455, 5.5.1 & 5.5.2] Federally Enforceable Through Title V Permit

111. The operator shall keep a copy of the operator management plan at the facility and make it available to the APCO, ARB and US EPA upon request. By January 30 of each year, the operator shall submit to the APCO for approval, in writing, an annual report indicating any changes to the existing, approved operator management plan. [District Rule 4455, 6.1.2 & 6.1.4] Federally Enforceable Through Title V Permit

112. The operator shall maintain an inspection log containing, at a minimum, 1) total number of components inspected, and total number and percentage of leaking components found by component types, 2) location, type, name or description of each leaking component, and description of any unit where the leaking component is found, 3) date of leak detection and method of leak detection, 4) for gaseous leaks, record the leak concentration in ppmv, and for liquid leaks record whether the leak is a major liquid leak or a minor liquid leak, 5) date of repair, replacement, or removal from operation of leaking components, 6) identification and location of essential component and critical components found leaking that cannot be repaired until the next process unit turnaround or not later one year after leak detection, whichever comes earlier, 7) methods used to minimize the leak from essential components and critical components that cannot be repaired until the next process unit turnaround or not later one year after leak detection, whichever comes earlier, 8) after the component is repaired or is replaced, the date of reinspection and the leak concentration in ppmv, 9) inspector's name, business mailing address, and business telephone number, and 10) the facility operator responsible for the inspection and repair program shall sign and date the inspection log certifying the accuracy of the information recorded in the log. [District Rule 4455, 6.2.1] Federally Enforceable Through Title V Permit

113. Records of each calibration of the portable hydrocarbon detection instrument utilized for inspecting components, including a copy of current calibration gas certification from the vendor of said calibration gas cylinder, the date of calibration, concentration of calibration gas, analyzer reading of calibration gas before adjustment, instrument reading of calibration gas after adjustment, calibration gas expiration date, and calibration gas cylinder pressure at the time of calibration. [District Rule 4455, 6.2.3] Federally Enforceable Through Title V Permit

114. The operator shall notify the APCO, by telephone or other methods approved by the APCO, of any process PRD release described in Sections 5.4.4 and 5.4.5, and any release in excess of the reportable quantity limits as stipulated in 40 CFR, Part 117, Part 302 and Part 355, including any release in excess of 100 pounds of VOC, within one hour of such occurrence or within one hour of the time said person knew or reasonably should have known of its occurrence. This requirement applies only to any process PRD that is vented to atmosphere. [District Rule 4455, 6.3.1] Federally Enforceable Through Title V Permit

115. The operator shall submit a written report to the APCO within thirty (30) calendar days following a PRD release subject to 6.3.1. The written report shall include 1) process PRD type, size, and location, 2) date, time and duration of the process PRD release, 3) types of VOC released and individual amounts, in pounds, including supporting calculations, 4) cause of the process PRD release, and 5) corrective actions taken to prevent a subsequent process PRD release. This requirement applies only to any process PRD that is vented to atmosphere. [District Rule 4455 6.3.2] Federally Enforceable Through Title V Permit

116. Copies of all records shall be retained for a minimum of five (5) years after the date of an entry. Such records shall be made available to the APCO, ARB, or US EPA upon request. [District Rule 4455, 6.2.2, 6.2.3 & 6.2.4] Federally Enforceable Through Title V Permit

117. Measurements of gaseous leak concentrations shall be conducted according to US EPA Method 21 using an appropriate portable hydrocarbon detection instrument calibrated with methane. The instrument shall be calibrated in accordance with the procedures specified in US EPA Method 21 or the manufacturer's instruction, as appropriate, not more than 30 days prior to its use. The operator shall record the calibration date of the instrument. [District Rule 4455, 6.4.1] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

118. The VOC content shall be determined using American Society of Testing and Materials (ASTM) D 1945 for gases and South Coast Air Quality Management District (SCAQMD) Method 304-91 for liquids. [District Rule 4455, 6.4.2] Federally Enforceable Through Title V Permit

119. The percent by volume liquid evaporated at 150 C shall be determined using ASTM D 86. [District Rule 4455, 6.4.3] Federally Enforceable Through Title V Permit

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

DRAFT

PERMIT NO: S-33-411-0 **ISSUANCE DATE:** DRAFT

LEGAL OWNER OR OPERATOR: BIG WEST OF CA, LLC
MAILING ADDRESS: 6451 ROSEDALE HWY (AREA 1 & 2)
BAKERSFIELD, CA 93308

LOCATION: 6451 ROSEDALE HWY (AREA 1 & 2)
BAKERSFIELD, CA 93308

EQUIPMENT DESCRIPTION:
LIQUID PETROLEUM GAS (LPG) ALKYLATION UNIT WITH MEROX FEED TREATMENT UNIT AND ISO-STRIPPER REBOILER WITH A MAXIMUM HEAT INPUT RATING OF 215 MM BTU/HR AND EQUIPPED WITH 8 ZEECO MODEL GLSF-14 ULTRA-LOW-NOX BURNERS OR EQUIVALENT AND SELECTIVE CATALYTIC REDUCTION

CONDITIONS

1. {1829} The facility shall submit an application to modify the Title V permit in accordance with the timeframes and procedures of District Rule 2520. [District Rule 2520] Federally Enforceable Through Title V Permit
2. {1830} This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District NSR Rule] Federally Enforceable Through Title V Permit
3. Permittee shall submit to the District final design details for the burners, SCR emissions control system and continuous emission monitors required for this unit, at least 30 days prior to initiation of construction on this unit. [District Rule 2201]
4. Permittee shall obtain APCO approval for the use of any equivalent low-NOx burner not specifically approved by this ATC document prior to installation. Approval of any equivalent low-NOx burner shall be made by the APCO's determination that the submitted design and performance data for alternate burner are equivalent to an approved burner. [District Rule 2201] Federally Enforceable Through Title V Permit
5. Permittee's request for approval of an equivalent low-NOx burner shall include at minimum the following information: burner manufacturer and model number, maximum heat input rating, manufacturer's performance and design specifications, manufacturer's burner drawings, and description of low-NOx operation. [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 326-6900 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director / APCO

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DAVID WARNER, Director of Permit Services

6. At least 30 days prior to initial startup of this unit, the operator shall provide and have approved by the District a startup/shutdown plan. The plan shall provide a description and the expected duration of each planned startup/shutdown activity, and how emissions will be controlled during these periods, consistent with good engineering practices and equipment manufacturer requirements. The startup/shutdown plan shall address the following: preparation; light-off, warm-up and refractory drying-out of the heater; loading of the feed dryers and alumina treaters; HF addition; charging of olefin feed; discontinuing feed, neutralizing HF in the unit, and regenerating dryers at shutdown; and chemical cleaning after shutdown and prior to maintenance. [District Rule 2201] Federally Enforceable Through Title V Permit

7. The duration of each startup period for this unit shall not exceed 12 hours. The duration of each shutdown period for this unit shall not exceed 9 hours. [District Rules 2201, 4305 and 4306] Federally Enforceable Through Title V Permit

8. During each startup and shutdown period, the emission control systems shall be in operation and emissions shall be minimized insofar as is technologically feasible. [District Rules 2201, 4305 and 4306] Federally Enforceable Through Title V Permit

9. The permittee shall maintain records of the duration of each startup period for this unit. [District Rules 2201, 4305 and 4306] Federally Enforceable Through Title V Permit

10. The Alkylation Unit shall use Modified HF which contains an additive to reduce the ability of the catalyst to form an aerosol (vapor cloud) if accidentally released to the atmosphere. The modified HF shall be delivered premixed to the Big West refinery, and no anhydrous HF shall be stored onsite. B. All modified HF acid-containing equipment shall be located within a paved and curbed area in the Alkylation Unit. This paved and curbed area shall include an HF Acid Neutralizing Basin. [CEQA]

11. The Alkylation Unit shall be equipped with a water deluge system capable of covering the Alkylation Unit area with water to capture HF in the event of an atmospheric release of HF from the Alkylation Unit. The deluge system shall include a water fog system capable of delivering 6,000 gallons per minute (gpm), and a water curtain comprised of six overhead distributors capable of delivering 1,000 gpm. [CEQA]

12. Ammonia injection grid shall be equipped with operational ammonia flowmeter and injection pressure indicator. [District Rule 2201] Federally Enforceable Through Title V Permit

13. Permittee shall monitor and record exhaust gas temperature at selective catalytic reduction catalyst inlet. [District Rule 2201] Federally Enforceable Through Title V Permit

14. Total sulfur content of fuel combusted in this unit used shall not exceed 40 ppmv (measured as H2S), based on a 4-hr rolling average . [District Rule 2201] Federally Enforceable Through Title V Permit

15. Except during startup and shutdown periods, emission rates shall not exceed any of the following: NOx (as NO2): 5 ppmv @ 3% O2, PM-10: 0.0076 lb/MMBtu, CO: 10 ppmv @ 3% O2 (3 hour average basis) and 400 ppmv @ 3% O2 (15 minute average basis), VOC: 0.0055 lb/MMBtu or ammonia slip: 10 ppmv @ 3% O2 (3 hour rolling average basis). [District Rules 2201, 4305, 4306 and 4351] Federally Enforceable Through Title V Permit

16. Emission rates shall not exceed any of the following: NOx (as NO2): 31.3 lb/day, SOx (as SO2): 28.9 lb/day, PM10: 38.4 lb/day, CO: 38.1 lb/day, VOC: 27.9 lb/day (non-fugitive) and ammonia: 23.2 lb/day. [District Rule 2201] Federally Enforceable Through Title V Permit

17. Fugitive VOC emissions from components associated with this unit shall not exceed 50.1 lb/day. [District Rule 2201] Federally Enforceable Through Title V Permit

18. Prior to operating equipment under this Authority to Construct, permittee shall surrender emission reduction credits to offset the calendar quarter emissions increases set forth below, at the distance offset ratio specified in Rule 2201 (as amended 12/15/05) Table 4.2 and the interpollutant offset ratio specified in this permit, NOx (as NO2) - Q1: 2,856 lb, Q2: 2,856 lb, Q3: 2,856 lb, and Q4: 2,856 lb; SOx (as SO2) - Q1: 2,637 lb, Q2: 2,637 lb, Q3: 2,637 lb and Q4: 2,637 lb; PM10 - Q1: 3,504 lb, Q2: 3,504 lb, Q3: 3,504 lb and Q4: 3,504 lb; CO - Q1: 3,477 lb, Q2: 3,477 lb, Q3: 3,477 lb and Q4: 3,477 lb, and VOC - Q1: 7,118 lb, Q2: 7,118 lb, Q3: 7,118 lb and Q4: 7,118 lb. [District Rule 2201] Federally Enforceable Through Title V Permit

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19. ERC Certificate Number S-2183-2 (or certificates split from this certificate) shall be used to supply the required NOx and PM10 offsets, ERC Certificate Number S-2178-3 (or a certificate split from this certificate) shall be used to supply the required CO offsets, ERC Certificate Number S-2452-1 (or a certificate split from this certificate) shall be used to supply the required VOC offsets and ERC Certificate Numbers S-2177-5 and/or S-2184-5 (or certificates split from these certificates) shall be used to supply the required SOx, unless a revised offsetting proposal is received and approved by the District, upon which this Authority to Construct shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of this Authority to Construct. [District Rule 2201] Federally Enforceable Through Title V Permit

20. NOx ERCs may be used to offset PM10 emission increases at a ratio of 2.16 lb NOx : 1 lb PM10. [District Rule 2201] Federally Enforceable Through Title V Permit

21. At least once per week for an initial period of six weeks, and thereafter, at least once every six months, permittee shall obtain and analyze a representative sample for total reduced sulfur of the fuel combusted in this unit. Samples shall be analysed using ASTM Test Method D6228-98, D4468-85 or D1072-06, or an alternative analytical method approved in advance by the APCO. [District Rule 2201] Federally Enforceable Through Title V Permit

22. This unit shall be equipped with a continuous monitoring system to measure and record fuel consumption. [District Rules 2201 and 4001] Federally Enforceable Through Title V Permit

23. Exhaust duct downstream of the SCR unit shall be equipped with continuously recording emissions monitors (CEMS) for NOx and O2. All CEMS shall be dedicated to this unit. CEMS shall meet the requirements of 40 CFR Part 60. [District Rule 1080] Federally Enforceable Through Title V Permit

24. The facility shall install and maintain equipment, facilities, and systems compatible with the District's CEM data polling software system and shall make CEM data available to the District's automated polling system on a daily basis. [District Rule 1080] Federally Enforceable Through Title V Permit

25. Upon notice by the District that the facility's CEM system is not providing polling data, the facility may continue to operate without providing automated data for a maximum of 30 days per calendar year provided the CEM data is sent to the District by a District-approved alternative method. [District Rule 1080] Federally Enforceable Through Title V Permit

26. The exhaust stack shall be equipped with permanent provisions to allow collection of stack gas samples consistent with EPA test methods and shall be equipped with safe permanent provisions to sample stack gases with a portable NOx, CO, and O2 analyzer during District inspections. The sampling ports shall be located in accordance with the CARB regulation titled California Air Resources Board Air Monitoring Quality Assurance Volume VI, Standard Operating Procedures for Stationary Emission Monitoring and Testing. [District Rule 1081] Federally Enforceable Through Title V Permit

27. The permittee shall monitor and record the stack concentration of CO at least once every month (in which a source test is not performed) using a portable emission monitor that meets District specifications. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last month. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

28. If the CO concentrations corrected to 3% O2, as measured by the portable analyzer, exceed the allowable emissions concentration, the permittee shall return the emissions to within the acceptable range as soon as possible, but no longer than 1 hour of operation after detection. If the portable analyzer readings continue to exceed the allowable emissions concentration after 1 hour of operation after detection, the permittee shall notify the District within the following 1 hour and conduct a certified source test within 60 days of the first exceedance. In lieu of conducting a source test, the permittee may stipulate a violation has occurred, subject to enforcement action. The permittee must then correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of the performing the notification and testing required by this condition. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

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29. All alternate monitoring parameter emission readings shall be taken with the unit operating either at conditions representative of normal operations or conditions specified in the Permit to Operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Emission readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

30. The permittee shall maintain records of: (1) the date and time of CO measurements, (2) the O2 concentration in percent and the measured CO concentrations corrected to 3% O2, (3) make and model of exhaust gas analyzer, (4) exhaust gas analyzer calibration records, and (5) a description of any corrective action taken to maintain the emissions within the acceptable range. [District Rules 4305 and 4306] Federally Enforceable Through Title V Permit

31. The permittee shall demonstrate continuous compliance with the sulfur content limit of the fuel combusted in this unit by calculation, as the product of the fuel H2S concentration and the ratio of total sulfur to H2S, based on the most recently conducted fuel sample analysis for total sulfur. The total sulfur of the fuel shall be calculated for each one hour H2S monitoring result, and the hourly fuel sulfur values shall be averaged over a rolling three hour period to determine compliance. [District Rule 2201] Federally Enforceable Through Title V Permit

32. Within 90 days of commencement of normal, continuous operation of this unit, operator shall inspect all components for leaks using a portable hydrocarbon detection instrument and the methods specified in Section 6.4.1 of Rule 4455, except for those components that are specifically exempted from the requirements of Rule 4455. [District Rule 2201] Federally Enforceable Through Title V Permit

33. Operator shall demonstrate compliance with fugitive VOC emissions limit of this permit within 60 days after the completion of the initial inspection of components and annually thereafter within 60 days after completion of the annual inspection of components required by Rule 4455. Compliance shall be demonstrated by calculation, using the correlation equations, zero default and 10,000 ppmv pegged factors set forth in the CAPCOA California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities, Table IV-3a, February 1999, and the average emission concentrations of total organic compounds measured for each component during all inspections conducted during the prior 365 day period. [District Rule 2201] Federally Enforceable Through Title V Permit

34. The permittee shall monitor and record the stack concentration of ammonia (NH3) at least once during each month in which a source test is not performed. NH3 monitoring shall be conducted utilizing Draeger tubes or a District approved equivalent method. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within one day of restarting the unit unless monitoring has been performed within the last month. [District Rule 4102]

35. The permittee shall maintain records of: (1) the date and time of ammonia (NH3) measurements, (2) the O2 concentration in percent by volume and the measured NH3 concentrations corrected to 3% O2, (3) the method of determining the NH3 emission concentration, and (4) a description of any corrective action taken to maintain the emissions at or below the acceptable levels. [District Rule 4102]

36. Compliance with NOx, CO, PM and ammonia slip emission limits shall be demonstrated within 120 days of initial operation. Compliance with NOx, CO and ammonia slip emission limits shall be demonstrated once every twelve months thereafter. Compliance demonstration shall be by District authorized in situ sampling of heater vent stack exhaust gases by a qualified independent source test firm at conditions representative of normal operation. [District Rules 2201, 4102, 4305, 4306 and 4351] Federally Enforceable Through Title V Permit

37. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified 30 days prior to any compliance source test, and a source test plan must be submitted for approval 15 days prior to testing. [District Rule 1081] Federally Enforceable Through Title V Permit

38. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081] Federally Enforceable Through Title V Permit

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39. The following test methods shall be used: NOx EPA Method 7E or ARB Method 100; CO EPA method 10, 10B or ARB Method 100; O2 EPA Method 3, 3A or ARB Method 100; VOC EPA method 18 or 25; PM10 EPA Method 5 (front and back half) or EPA Methods 201A and 202, and ammonia BAAQMD ST-1B. EPA approved alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rules 1081, 2201, 4305, 4306 and 4351] Federally Enforceable Through Title V Permit

40. Compliance demonstration shall be based on the arithmetic mean, pursuant to District Rule 1081(amended December 16, 1993), of 3 thirty-minute test runs for NOx and CO. [District Rule 2520, 9.3.2] Federally Enforceable Through Title V Permit

41. All required source testing shall conform to the compliance testing procedures described in District Rule 1081(Last Amended December 19, 1993). [District Rule 1081, and Kern County Rule 108.1] Federally Enforceable Through Title V Permit

42. {588} Particulate matter emissions shall not exceed 0.1 grain/dscf, 0.1 grain/dscf calculated to 12% CO2, nor 10 lb/hr. [District Rules 4201, 3.1 and 4301, 5.1 and 5.2.3] Federally Enforceable Through Title V Permit

43. Emissions of sulfur compounds from this unit shall not exceed 200 lb per hour, calculated as SO2. Compliance with this requirement shall be demonstrated by multiplying the sulfur content (ppmv, as total reduced sulfur) by the hourly volumetric fuel flow (scf/hr) to this unit, and converting to SO2. [District Rule 2520, 9.3.2 and District Rule 4301, 5.2.1] Federally Enforceable Through Title V Permit

44. If fuel analysis is used to demonstrate compliance with the conditions of this permit, the fuel higher heating value for each fuel shall be certified by third party fuel supplier or determined by: ASTM D 1826 or D 1945 in conjunction with ASTM D 3588 for gaseous fuels. [District Rule 2520, 9.3.2; 4305, 6.2.1; and 4351, 6.2.1] Federally Enforceable Through Title V Permit

45. The concentration of sulfur compounds in the exhaust from this unit shall not exceed 0.2% by volume as measured on a dry basis over a 15 minute period (Kern County Rule 407). To demonstrate compliance with this requirement the operator shall test the sulfur content of each fuel source and demonstrate the sulfur content does not exceed 3.3% by weight for gaseous fuels; or determine that the concentration of sulfur compounds in the exhaust does not exceed the concentration limit by a combination of source testing and fuel analysis. [District Rule 4801 and Kern County Rule 407] Federally Enforceable Through Title V Permit

46. Nitrogen oxide (NOx) emissions shall not exceed 140 lb/hr, calculated as NO2. [District Rules 4301, 5.2.2] Federally Enforceable Through Title V Permit

47. Operators shall not depressurize any vessel containing VOCs unless the process unit turnaround is accomplished by employing one of the following operating procedures: The organic vapors shall either be recovered, added to the refinery fuel gas system and combusted; or controlled and piped to an appropriate firebox or incinerated for combustion; or flared, until the pressure within the process vessel is as close to atmospheric pressure as is possible. All process vessels shall be depressurized into the control facilities to less than 1020 mm Hg (5 psig) before venting/opening to atmosphere. All organic compounds which emerge from a refinery process vessel during the purging of said vessel and which otherwise would be emitted to the atmosphere shall be either directed to a flare or incinerator or shall be used for fuel until such disposition of emissions is not technically feasible or is less safe than atmospheric venting. [District Rule 4454, 4.0] Federally Enforceable Through Title V Permit

48. The operator shall not burn in any fuel gas combustion device any fuel that contains hydrogen sulfide (H2S) in excess of 162 ppmv determined hourly on a 3 hour rolling average basis and H2S in excess of 60 ppmv determined daily on a 365 successive calendar day rolling average basis. [40 CFR 60.102a(g)(1)(ii)] Federally Enforceable Through Title V Permit

49. A continuous emissions monitoring system for fuel gas H2S shall be installed, calibrated, operated, and reported according to EPA guidelines as specified under 40 CFR 60.107a(a)(2). CEM results shall be calculated on a rolling three (3) hour basis. [40 CFR 60, 60.107a(a)(2)] Federally Enforceable Through Title V Permit

50. Operator shall report all rolling 3-hour periods during which the average concentration of H2S as measured by the H2S continuous monitoring system exceeds 162 ppmv and all rolling 365-day periods during which the average concentration of H2S as measured by the H2S continuous monitoring system exceeds 60 ppmv. [40 CFR 60.107a(f)] Federally Enforceable Through Title V Permit

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51. Operator shall determine compliance with the H2S standard using EPA Methods 11, 15, 15A, or 16. [40 CFR 60.104a(j)] Federally Enforceable Through Title V Permit

52. Operator shall conduct a root cause analysis of any emission limit exceedance or process start-up, shutdown, upset, or malfunction that causes a discharge to the atmosphere in excess of 500 lb/day of SO2. For any root cause analysis performed, the owner or operator shall record the identification of the affected facility, the date and duration of the discharge, the results of the root cause analysis, and the action taken as a result of the root cause analysis. [40 CFR 60.103a(b)] Federally Enforceable Through Title V Permit

53. The owner or operator shall comply with the requirements 40 CFR 60.482-1 to 40 CFR 60.482-10 as soon as practical, but no later than 180 days after initial start. [40 CFR 60.592(a)] Federally Enforceable Through Title V Permit

54. Each pump in light liquid service (PLLS) shall be monitored monthly to detect leaks by the methods specified in 40 CFR 60.485(b), except as provided in 40 CFR 60.482-1(c) and 40 CFR 60.482-2(d), (e), and (f). Each pump in light liquid service shall be checked by visual inspection each calendar week for indications of liquids dripping from the pump seal. A leak is detected if an instrument reading of 10,000 ppm or greater is measured or if there are indications of liquids dripping from the pump seal. [40 CFR 60.482-2(a) and (b)] Federally Enforceable Through Title V Permit

55. When a leak is detected for each PLLS, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in 40 CFR 60.482-9. A first attempt at repair shall be made no later than 5 calendar days after each leak is detected. [40 CFR 60.482-2(c)] Federally Enforceable Through Title V Permit

56. Each PLLS equipped with a dual mechanical seal system that includes a barrier fluid system is exempt from the requirements of 40 CFR 60.482-2(a) provided the requirements specified in 40 CFR 60.482-2(d)(1) through (6) are met. [40 CFR 60.482(d)] Federally Enforceable Through Title V Permit

57. Any PLLS that is designated, as described in 40 CFR 60.486(e)(1) and (2), for no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, is exempt from the requirements of 40 CFR 60.482-2(a), (c), and (d) if the pump meets the requirements specified in 40 CFR 60.482-2(e)(1), (2), and (3). [40 CFR 60.482-2(e)] Federally Enforceable Through Title V Permit

58. If any PLLS is equipped with a closed vent system capable of capturing and transporting leakage from the seal or seals to a control device that complies with the requirements of 40 CFR 60.482-10, it is exempt from the requirements of 40 CFR 60.482-2(a) through (e). [40 CFR 60.482-2(f)] Federally Enforceable Through Title V Permit

59. Any pump in PLLS that is designated, as described in 40 CFR 60.486(f)(1), as an unsafe-to-monitor pump is exempt from the monitoring and inspection requirements of 40 CFR 60.482-2(a) and 40 CFR 60.482-2(d)(4) through (6) if: 1). The owner or operator of the pump demonstrates that the pump is unsafe-to-monitor because monitoring personnel would be exposed to an immediate danger as a consequence of complying with 40 CFR 60.482-2(a); and 2) The owner or operator of the pump has a written plan that requires monitoring of the pump as frequently as practicable during safe-to-monitor times but not more frequently than the periodic monitoring schedule otherwise applicable, and repair of the equipment according to the procedures in 40 CFR 60.482-2(c) if a leak is detected. [40 CFR 60.482-2(g)] Federally Enforceable Through Title V Permit

60. Pressure relief devices shall be vented to the refinery flare gas recovery system. [40 CFR 60.482-4(c)] Federally Enforceable Through Title V Permit

61. Except for in-situ sampling systems and sampling systems without purges, each sampling connection system shall be equipped with a closed-purge, closed-loop, or closed-vent system, except as provided in 40 CFR 60.482-1(c). Each closed-purge, closed-loop, or closed-vent system shall comply with the requirements specified in 40 CFR 60.482-5(b)(1), (2), (3), and (4). [40 CFR 60.482-5(a), (b), and (c)] Federally Enforceable Through Title V Permit

62. Each open-ended valve or line shall be equipped with a cap, blind flange, plug, or a second valve, except as provided in 40 CFR 60.482-1(c). The cap, blind flange, plug, or second valve shall seal the open end at all times except during operations requiring process fluid flow through the open-ended valve or line. When a double block-and-bleed system is being used, the bleed valve or line may remain open during operations that require venting the line between the block valves but shall comply with this condition at all other times. [40 CFR 60.482-6(a) and (c)] Federally Enforceable Through Title V Permit

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63. Each open-ended valve or line equipped with a second valve shall be operated in a manner such that the valve on the process fluid end is closed before the second valve is closed. [40 CFR 60.482-6(b)] Federally Enforceable Through Title V Permit

64. Each valve in gas/vapor service and in light liquid service shall be monitored monthly to detect leaks by the methods specified in 40 CFR 60.485(b) and shall comply with 40 CFR 60.482-7(b) through (e), except as provided in 40 CFR 60.482-7(f), (g), and (h), 40 CFR 60.483-1, 40 CFR 60.483-2, and 40 CFR 60.482-1(c). A leak is detected if an instrument reading of 10,000 ppm or greater is measured. [40 CFR 60.482-7(a) and (b)] Federally Enforceable Through Title V Permit

65. Any valve in gas/vapor service or in light liquid service for which a leak is not detected for 2 successive months may be monitored the first month of every quarter, beginning with the next quarter, until a leak is detected. If a leak is detected, the valve shall be monitored monthly until a leak is not detected for 2 successive months. [40 CFR 60.482-7(c)] Federally Enforceable Through Title V Permit

66. When a leak is detected for any valve in gas/vapor service or in light liquid service, it shall be repaired as soon as practicable, but no later than 15 calendar days after the leak is detected, except as provided in 40 CFR 60.482-9. A first attempt at repair shall be made no later than 5 calendar days after each leak is detected. First attempts at repair include, but are not limited to, the best practices specified in 40 CFR 60.482-7(e)(1), (2), (3), and (4), where practicable. [40 CFR 60.482-7(d) and (e)] Federally Enforceable Through Title V Permit

67. If evidence of a potential leak is found by visual, audible, olfactory, or any other detection method at pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and connectors, the owner or operator shall follow either one of the following procedures: 1) The owner or operator shall monitor the equipment within 5 days by the method specified in 40 CFR 60.485(b) and shall comply with the requirements of 40 CFR 60.482-8(b) through (d); or 2) The owner or operator shall eliminate the visual, audible, olfactory, or other indication of a potential leak. A leak is detected if an instrument reading of 10,000 ppm or greater is measured. [40 CFR 60.482-8(a) and (b)] Federally Enforceable Through Title V Permit

68. When a leak is detected in pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and connectors, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in 40 CFR 60.482-9. The first attempt at repair shall be made no later than 5 calendar days after each leak is detected. First attempts at repair include, but are not limited to, the best practices described under 40 CFR 60.482-7(e). [40 CFR 60.482-8(c) and (d)] Federally Enforceable Through Title V Permit

69. Except as provided in 40 CFR 60.482-10(i) through (k), each closed vent system used to comply with the provisions of Subpart GGG shall be inspected according to the procedures and schedule specified in 40 CFR 60.482-10(f)(1) and (f)(2). Leaks, as indicated by an instrument reading greater than 500 parts per million by volume above background or by visual inspections, shall be repaired as soon as practicable except as provided in 40 CFR 60.482-10(h). A first attempt at repair shall be made no later than 5 calendar days after the leak is detected. Repair shall be completed no later than 15 calendar days after the leak is detected. [40 CFR 60.482-10(f) and (g)] Federally Enforceable Through Title V Permit

70. Delay of repair of a closed vent system for which leaks have been detected is allowed if the repair is technically infeasible without a process unit shutdown or if the owner or operator determines that emissions resulting from immediate repair would be greater than the fugitive emissions likely to result from delay of repair. Repair of such equipment shall be complete by the end of the next process unit shutdown. [40 CFR 60.482-10(h)] Federally Enforceable Through Title V Permit

71. The owner or operator shall record the following information: 1) Identification of all parts of the closed vent system that are designated as unsafe to inspect, an explanation of why the equipment is unsafe to inspect, and the plan for inspecting the equipment; 2) Identification of all parts of the closed vent system that are designated as difficult to inspect, an explanation of why the equipment is difficult to inspect, and the plan for inspecting the equipment; 3) For each inspection during which a leak is detected, a record of the information specified in 40 CFR 60.486(c); 4) For each inspection conducted in accordance with 40 CFR 60.485(b) during which no leaks are detected, a record that the inspection was performed, the date of the inspection, and a statement that no leaks were detected; and 5) For each visual inspection conducted in accordance with 40 CFR 60.482-10(f)(1)(ii) during which no leaks are detected, a record that the inspection was performed, the date of the inspection, and a statement that no leaks were detected. [40 CFR 60.482-10(l)] Federally Enforceable Through Title V Permit

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72. Closed vent systems and control devices used to comply with provisions Subpart GGG shall be operated at all times when emissions may be vented to them. [40 CFR 60.482-10(m)] Federally Enforceable Through Title V Permit

73. In conducting the performance tests required in 40 CFR 60.8, the owner or operator shall use as reference methods and procedures the test methods in 40 CFR 60, Appendix A or other methods and procedures as specified in 40 CFR 60.485, except as provided in 40 CFR 60.8(b). [40 CFR 60.485(a)] Federally Enforceable Through Title V Permit

74. The owner or operator shall determine compliance with the standards in 40 CFR 60.482, 60.483, and 60.484 as follows: Method 21 shall be used to determine the presence of leaking sources. The instrument shall be calibrated before use each day of its use by the procedures specified in Method 21. The following calibration gases shall be used: (i) Zero air (less than 10 ppm of hydrocarbon in air); and (ii) A mixture of methane or n-hexane and air at a concentration of about, but less than, 10,000 ppm methane or n-hexane. [40 CFR 60.485(b)] Federally Enforceable Through Title V Permit

75. The owner or operator shall determine compliance with the no detectable emission standards in 40 CFR 60.482-2(e), 60.482-3(i), 60.482-4, 60.482-7(f), and 60.482-10(e) as follows: 1) The requirements of 40 CFR 60.485(b) shall apply. 2) Method 21 shall be used to determine the background level. All potential leak interfaces shall be traversed as close to the interface as possible. The arithmetic difference between the maximum concentration indicated by the instrument and the background level is compared with 500 ppm for determining compliance. [40 CFR 60.485(c)] Federally Enforceable Through Title V Permit

76. The owner or operator shall test each piece of equipment unless demonstrated that a process unit is not in VOC service, i.e., that the VOC content would never be reasonably expected to exceed 10 percent by weight. For purposes of this demonstration, the following methods and procedures shall be used: 1) Procedures that conform to the general methods in ASTM E260-73, 91, or 96, E168-67, 77, or 92, E169-63, 77, or 93 (incorporated by reference as seen in 40 CFR 60.17) shall be used to determine the percent VOC content in the process fluid that is contained in or contacts a piece of equipment; 2) Organic compounds that are considered by the Administrator to have negligible photochemical reactivity may be excluded from the total quantity of organic compounds in determining the VOC content of the process fluid; and 3) Engineering judgment may be used to estimate the VOC content, if a piece of equipment had not been shown previously to be in service. If the Administrator disagrees with the judgment, the previous two procedures as specified in 40 CFR 60.485(d)(1) and (2) shall be used to resolve the disagreement. [40 CFR 60.485(d)] Federally Enforceable Through Title V Permit

77. The owner or operator shall demonstrate that an equipment is in light liquid service by showing that all the following conditions apply: 1) The vapor pressure of one or more of the components is greater than 0.3 kPa at 20 °C (1.2 in. H2O at 68 degrees F). Standard reference texts or ASTM D2879-83, 96, or 97 (incorporated by reference as seen in 40 CFR 60.17) shall be used to determine the vapor pressures; 2) The total concentration of the pure components having a vapor pressure greater than 0.3 kPa at 20 degrees Celsius is equal to or greater than 20 percent by weight; and 3) The fluid is a liquid at operating conditions. [40 CFR 60.485(e)] Federally Enforceable Through Title V Permit

78. Samples used in conjunction with 40 CFR 60.485(d), (e), and (g) shall be representative of the process fluid that is contained in or contacts the equipment or the gas being combusted in the flare. [40 CFR 60.485(f)] Federally Enforceable Through Title V Permit

79. An owner or operator of more than one affected facility subject to the provisions Subpart GGG may comply with the recordkeeping requirements for these facilities in one recordkeeping system if the system identifies each record by each facility. [40 CFR 60.486(a)] Federally Enforceable Through Title V Permit

80. When each leak is detected as specified in 40 CFR 60.482-2, 60.482-3, 60.482-7, 60.482-8, and 60.483-2, the following requirements apply: 1) A weatherproof and readily visible identification, marked with the equipment identification number, shall be attached to the leaking equipment; 2) The identification on a valve may be removed after it has been monitored for 2 successive months as specified in 40 CFR 60.482-7(c) and no leak has been detected during those 2 months; and 3) The identification on equipment except on a valve, may be removed after it has been repaired. [40 CFR 60.486(b)] Federally Enforceable Through Title V Permit

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81. When each leak is detected as specified in 40 CFR 60.482-2, 60.482-3, 60.482-7, 60.482-8, and 60.483-2, the following information shall be recorded in a log and shall be kept for 5 years in a readily accessible location: 1) The instrument and operator identification numbers and the equipment identification number; 2) The date the leak was detected and the dates of each attempt to repair the leak; 3) Repair methods applied in each attempt to repair the leak; 4) ``Above 10,000'' if the maximum instrument reading measured by the methods specified in 40 CFR 60.485(a) after each repair attempt is equal to or greater than 10,000 ppm; 5) ``Repair delayed'' and the reason for the delay if a leak is not repaired within 15 calendar days after discovery of the leak; 6) The signature of the owner or operator (or designate) whose decision it was that repair could not be effected without a process shutdown; 7) The expected date of successful repair of the leak if a leak is not repaired within 15 days; 8) Dates of process unit shutdown that occur while the equipment is unrepaired; and 9) The date of successful repair of the leak. [40 CFR 60.486(c) and District Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit

82. The following information pertaining to the design requirements for closed vent systems and control devices described in 40 CFR 60.482-10 shall be recorded and kept in a readily accessible location: 1) Detailed schematics, design specifications, and piping and instrumentation diagrams; 2) The dates and descriptions of any changes in the design specifications; 3) A description of the parameter or parameters monitored, as required in 40 CFR 60.482-10(e), to ensure that control devices are operated and maintained in conformance with their design and an explanation of why that parameter (or parameters) was selected for the monitoring; 4) Periods when the closed vent systems and control devices required in 40 CFR 60.482-2, 60.482-3, 60.482-4, and 60.482-5 are not operated as designed, including periods when a flare pilot light does not have a flame; and 5) Dates of startups and shutdowns of the closed vent systems and control devices required in 40 CFR 60.482-2, 60.482-3, 60.482-4, and 60.482-5. [40 CFR 60.486(d)] Federally Enforceable Through Title V Permit

83. The following information pertaining to all equipment subject to the requirements in 40 CFR 60.482-1 to 60.482-10 shall be recorded in a log that is kept in a readily accessible location: 1) A list of identification numbers for equipment subject to the requirements of Subpart GGG; 2) (i) A list of identification numbers for equipment that are designated for no detectable emissions under the provisions of 40 CFR 60.482-2(e), 60.482-3(i) and 60.482-7(f). (ii) The designation of equipment as subject to the requirements of 40 CFR 60.482-2(e), 60.482-3(i) and 60.482-7(f) shall be signed by the owner or operator; 3) A list of equipment identification numbers for pressure relief devices required to comply with §60.482-4; 4) (i) The dates of each compliance test as required in 40 CFR 60.482-2(e), 60.482-3(i), §60.482-4, and 60.482-7(f). (ii) The background level measured during each compliance test. (iii) The maximum instrument reading measured at the equipment during each compliance test; and 5) A list of identification numbers for equipment in vacuum service. [40 CFR 60.486(e)] Federally Enforceable Through Title V Permit

84. The following information pertaining to all valves subject to the requirements of 40 CFR 60.482-7(g) and (h) and to all pumps subject to the requirements of 40 CFR 60.482-2(g) shall be recorded in a log that is kept in a readily accessible location: 1) A list of identification numbers for valves and pumps that are designated as unsafe-to-monitor, an explanation for each valve or pump stating why the valve or pump is unsafe-to-monitor, and the plan for monitoring each valve or pump; and 2) A list of identification numbers for valves that are designated as difficult-to-monitor, an explanation for each valve stating why the valve is difficult-to-monitor, and the schedule for monitoring each valve. [40 CFR 60.486(f)] Federally Enforceable Through Title V Permit

85. The following information shall be recorded for valves complying with 40 CFR 60.483-2: 1) A schedule of monitoring; 2) The percent of valves found leaking during each monitoring period. [40 CFR 60.486(g)] Federally Enforceable Through Title V Permit

86. The following information shall be recorded in a log that is kept in a readily accessible location: 1) Design criterion required in 40 CFR 60.482-2(d)(5) and 60.482-3(e)(2) and explanation of the design criterion; and 2) Any changes to this criterion and the reasons for the changes. [40 CFR 60.486(h)] Federally Enforceable Through Title V Permit

87. The following information shall be recorded in a log that is kept in a readily accessible location for use in determining exemptions as provided in 40 CFR 60.480(d): 1) An analysis demonstrating the design capacity of the affected facility; 2) A statement listing the feed or raw materials and products from the affected facilities and an analysis demonstrating whether these chemicals are heavy liquids or beverage alcohol; and 3) An analysis demonstrating that equipment is not in VOC service. [40 CFR 60.486(i)] Federally Enforceable Through Title V Permit

88. Information and data used to demonstrate that a piece of equipment is not in VOC service shall be recorded in a log that is kept in a readily accessible location. [40 CFR 60.486(j)] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

89. All semiannual reports to the Administrator shall include the following information, summarized from the information in 40 CFR 60.486: 1) Process unit identification; 2) For each month during the semiannual reporting period, i) Number of valves for which leaks were detected as described in 40 CFR 60.482-7(b) or 40 CFR 60.483-2, (ii) Number of valves for which leaks were not repaired as required in 40 CFR 60.482-7(d)(1), (iii) Number of pumps for which leaks were detected as described in 40 CFR 60.482-2(b) and (d)(6)(i), (iv) Number of pumps for which leaks were not repaired as required in 40 CFR 60.482-2(c)(1) and (d)(6)(ii), (v) Number of compressors for which leaks were detected as described in 40 CFR 60.482-3(f), (vi) Number of compressors for which leaks were not repaired as required in 40 CFR 60.482-3(g)(1), and (vii) The facts that explain each delay of repair and, where appropriate, why a process unit shutdown was technically infeasible; 3) Dates of process unit shutdowns which occurred within the semiannual reporting period; 4) Revisions to items reported in the semiannual report if changes have occurred since the initial report, as required in 40 CFR 60.487 (a) and (b), or subsequent revisions to the initial report. [40 CFR 60.487(c)] Federally Enforceable Through Title V Permit

90. An owner or operator electing to comply with the provisions of 40 CFR 60.483-1 and 60.483-2 shall notify the Administrator of the alternative standard selected 90 days before implementing either of the provisions. [40 CFR 60.487(d)] Federally Enforceable Through Title V Permit

91. An owner or operator shall report the results of all performance tests in accordance with 40 CFR 60.8 of the General Provisions. The provisions of 40 CFR 60.8(d) do not apply to affected facilities subject to the provisions of Subpart GGG except that an owner or operator must notify the Administrator of the schedule for the initial performance tests at least 30 days before the initial performance tests. [40 CFR 60.487(e)] Federally Enforceable Through Title V Permit

92. The operator shall maintain all records of required monitoring data and support information for inspection at any time for a period of five years. [District Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit

93. Each drain receiving refinery wastewater from a process unit shall be equipped with water seal controls. [40 CFR 60.692-2(a)(1)] Federally Enforceable Through Title V Permit

94. Each drain in active service, receiving refinery wastewater from a process unit, shall be checked by visual or physical inspection initially and monthly thereafter for indications of low water levels or other conditions that would reduce the effectiveness of the water seal controls. [40 CFR 60.692-2(a)(2)] Federally Enforceable Through Title V Permit

95. A component shall be considered leaking if one or more of the conditions specified in Sections 5.1.4.1 through 5.1.4.4 of Rule 4455 exist at the facility. For this permit unit, except for pumps and compressors, a minor gas leak shall be defined for any component listed in Rule 4455 Section 3.22 Table 1 in either liquid or gas/vapor service as a reading in excess of 100 ppmv above background up to and including a reading of 10,000 ppmv above background. For pumps, compressors and other component types not specifically listed in Rule 4455 Section 3.22 Table 1 in either liquid or gas/vapor service, a minor gas leak shall be defined as a reading in excess of 500 ppmv above background up to and including a reading of 10,000 ppmv above background. Readings shall be taken as methane using a portable hydrocarbon detection instrument and shall be made in accordance with the methods specified in Section 6.4.1 of Rule 4455. [District Rules 2201 and 4455, 5.1.4] Federally Enforceable Through Title V Permit

96. The operator shall not use any component that leaks in excess of the allowable leak standards of Rule 4455, or is found to be in violation of the provisions specified in Section 5.1.3. A component identified as leaking in excess of an allowable leak standard may be used provided it has been identified with a tag for repair, has been repaired, or is awaiting re-inspection after repair, within the applicable time period specified within the rule. [District Rule Rule 4455, 5.1.1] Federally Enforceable Through Title V Permit

97. Each hatch shall be closed at all times except during sampling or adding of process material through the hatch, or during attended repair, replacement, or maintenance operations, provided such activities are done as expeditiously as possible and with minimal spillage of material and VOC emissions to the atmosphere. [District Rule 4455, 5.1.2] Federally Enforceable Through Title V Permit

98. The operator shall be in violation of Rule 4455 if any District inspection demonstrates that one or more of the conditions in Sections 5.1.4 exist at the facility. [District Rule 4455, 5.1.3.1] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

99. Except for annual operator inspection described in Section 5.1.3.2.3, any operator inspection that demonstrates one or more of the conditions in Section 5.1.4 exist at the facility shall not constitute a violation of Rule 4455 if the leaking components are repaired as soon as practicable but not later than the time frame specified in Rule 4455. Such components shall not be counted towards determination of compliance with the provisions of Section 5.1.4. [District Rule 4455, 5.1.3.2.1] Federally Enforceable Through Title V Permit

100. Leaking components detected during operator inspection pursuant Section 5.1.3.2.1 that are not repaired, replaced, or removed from operation as soon as practicable but not later than the time frame specified in Rule 4455 shall be counted toward determination of compliance with the provisions of Section 5.1.4. [District Rule 4455, 5.1.3.2.2] Federally Enforceable Through Title V Permit

101. Any operator inspection conducted annually for a component type (including operator annual inspections pursuant to Section 5.2.5, 5.2.6, 5.2.7, or 5.2.8) that demonstrates one or more of the conditions in Section 5.1.4 exist at the facility shall constitute a violation of Rule 4455 regardless of whether or not the leaking components are repaired, replaced, or removed from operation within the allowable repair time frame specified in Rule 4455. [District Rule 4455, 5.1.3.2.3] Federally Enforceable Through Title V Permit

102. The operator shall audio-visually inspect for leaks all accessible operating pumps, compressors and Pressure Relief Devices (PRDs) in service at least once every 24 hours, except when operators do not report to the facility for that given 24 hours. Any identified leak that cannot be immediately repaired shall be reinspected within 24 hours using a portable analyzer. If a leak is found, it shall be repaired as soon as practical but not later than the time frame specified in Table 3. [District Rule 4455, 5.2.1 & 5.2.2] Federally Enforceable Through Title V Permit

103. The operator shall inspect all components at least once every calendar quarter, except for inaccessible components, unsafe-to-monitor components and pipes. Inaccessible components, unsafe-to-monitor components and pipes shall be inspected in accordance with the requirements set forth in Sections 5.2.5, 5.2.6, and 5.2.7. New, replaced, or repaired fittings, flanges and threaded connections shall be inspected immediately after being placed into service. Components shall be inspected using EPA Method 21. [District Rule 4455, 5.2.3, 5.2.4, 5.2.5, 5.2.6 & 5.2.7] Federally Enforceable Through Title V Permit

104. The operator may apply for a written approval from the APCO to change the inspection frequency from quarterly to annually for a component type, provided the operator meets all the criteria specified in Sections 5.2.8.1 through 5.2.8.3. This approval shall apply to accessible component types, specifically designated by the APCO, except pumps, compressors, and PRDs which shall continue to be inspected on a quarterly basis. [District Rule 4455, 5.2.8] Federally Enforceable Through Title V Permit

105. An annual inspection frequency approved by the APCO shall revert to quarterly inspection frequency for a component type if either the operator inspection or District inspection demonstrates that a violation of the provisions of Sections 5.1, 5.2 and 5.3 of the rule exists for that component type, or the APCO issued a Notice of Violation for violating any of the provisions of Rule 4455 during the annual inspection period for that component type. When the inspection frequency changes from annual to quarterly inspections, the operator shall notify the APCO in writing within five (5) calendar days after changing the inspection frequency, giving the reason(s) and date of change to quarterly inspection frequency. [District Rule 4455, 5.2.9 & 5.2.10] Federally Enforceable Through Title V Permit

106. The operator shall initially inspect a process PRD that releases to the atmosphere as soon as practicable but not later than 24 hours after the time of the release. To insure that the process PRD is operating properly, and is leak-free, the operator shall re-inspect the process PRD not earlier than 24 hours after the initial inspection but not later than 15 calendar days after the date of the release using EPA Method 21. If the process PRD is found to be leaking at either inspection, the PRD leak shall be treated as if the leak was found during quarterly operator inspections. [District Rule 4455, 5.2.11] Federally Enforceable Through Title V Permit

107. Except for process PRD, a component shall be inspected within 15 calendar days after repairing the leak or replacing the component using EPA Method 21. [District Rule 4455, 5.2.12] Federally Enforceable Through Title V Permit

108. Upon detection of a leaking component, the operator shall affix to that component a weatherproof readily visible tag that contains the information specified in Section 5.3.3. The tag shall remain affixed to the component until the leaking component has been repaired or replaced; has been re-inspected using EPA Method 21; and is found to be in compliance with the requirements of Rule 4455. [District Rule 4455, 5.3.1 5.3.2 and 5.3.3] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

109. An operator shall minimize all component leaks immediately to the extent possible, but not later than one (1) hour after detection of leaks in order to stop or reduce leakage to the atmosphere. [District Rule 4455, 5.3.4] Federally Enforceable Through Title V Permit

110. If the leak has been minimized but the leak still exceeds the applicable leak standards of Rule 4455, an operator shall repair or replace the leaking component, vent the leaking component to a closed vent system, or remove the leaking component from operation as soon as practicable but not later than the time period specified in Table 3. For each calendar quarter, the operator may be allowed to extend the repair period as specified in Table 3, for a total number of leaking components, not to exceed 0.05 percent of the number of components inspected, by type, rounded upward to the nearest integer where required. [District Rule 4455, 5.3.5] Federally Enforceable Through Title V Permit

111. If the leaking component is an essential component or a critical component and which cannot be immediately shut down for repairs, the operator shall minimize the leak within one hour after detection of the leak. If the leak has been minimized, but the leak still exceeds any of the applicable leak standards of Rule 4455, the essential component or critical component shall be repaired or replaced to eliminate the leak during the next process unit turnaround, but in no case later than one year from the date of the original leak detection, whichever comes earlier. [District Rule 4455 5.3.6] Federally Enforceable Through Title V Permit

112. For any component that has incurred five repair actions for major gas leaks or major liquid leaks, or any combination of major gas leaks and major liquid leaks within a continuous 12-month period, the operator shall comply with at least one of the requirements specified in Sections 5.3.7.1, 5.3.7.2, 5.3.7.3, or 5.3.7.4 by the applicable deadlines specified in Sections 5.3.7.5 and 5.3.7.6. If the original leaking component is replaced with a new like-in-kind component before incurring five repair actions for major leaks within 12-consecutive months, the repair count shall start over for the new component. An entire compressor or pump need not be replaced provided the compressor part(s) or pump part(s) that have incurred five repair actions as described in Section 5.3.7 are brought into compliance with at least one of the requirements of Sections 5.3.7.1 through 5.3.7.6. [District Rule4455, 5.3.7] Federally Enforceable Through Title V Permit

113. The operator shall monitor process PRD by using electronic process control instrumentation that allows for real time continuous parameter monitoring or by using telltale indicators for the process PRD where parameter monitoring is not feasible. This requirement applies only to any process PRD that is vented to atmosphere. [District Rule 4455, 5.4.1] Federally Enforceable Through Title V Permit

114. All major components and critical components shall be physically identified clearly and visibly for inspection, repair, and recordkeeping purposes. The physical identification shall consist of labels, tags, manufacturer's nameplate identifier, serial number, or model number, or other system approved by the APCO that enables an operator or District personnel to locate each individual component. The operator shall replace tags or labels that become missing or unreadable as soon as practicable but not later than 24 hours after discovery. The operator shall comply with the requirements of Sections 6.1.4 if there is any change in the description of major components or critical components. [District Rule 4455, 5.5.1 & 5.5.2] Federally Enforceable Through Title V Permit

115. The operator shall keep a copy of the operator management plan at the facility and make it available to the APCO, ARB and US EPA upon request. By January 30 of each year, the operator shall submit to the APCO for approval, in writing, an annual report indicating any changes to the existing, approved operator management plan. [District Rule 4455, 6.1.2 & 6.1.4] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

116. The operator shall maintain an inspection log containing, at a minimum, 1) total number of components inspected, and total number and percentage of leaking components found by component types, 2) location, type, name or description of each leaking component, and description of any unit where the leaking component is found, 3) date of leak detection and method of leak detection, 4) for gaseous leaks, record the leak concentration in ppmv, and for liquid leaks record whether the leak is a major liquid leak or a minor liquid leak, 5) date of repair, replacement, or removal from operation of leaking components, 6) identification and location of essential component and critical components found leaking that cannot be repaired until the next process unit turnaround or not later one year after leak detection, whichever comes earlier, 7) methods used to minimize the leak from essential components and critical components that cannot be repaired until the next process unit turnaround or not later one year after leak detection, whichever comes earlier, 8) after the component is repaired or is replaced, the date of reinspection and the leak concentration in ppmv, 9) inspector's name, business mailing address, and business telephone number, and 10) the facility operator responsible for the inspection and repair program shall sign and date the inspection log certifying the accuracy of the information recorded in the log. [District Rule 4455, 6.2.1] Federally Enforceable Through Title V Permit

117. Records of each calibration of the portable hydrocarbon detection instrument utilized for inspecting components, including a copy of current calibration gas certification from the vendor of said calibration gas cylinder, the date of calibration, concentration of calibration gas, analyzer reading of calibration gas before adjustment, instrument reading of calibration gas after adjustment, calibration gas expiration date, and calibration gas cylinder pressure at the time of calibration. [District Rule 4455, 6.2.3] Federally Enforceable Through Title V Permit

118. The operator shall notify the APCO, by telephone or other methods approved by the APCO, of any process PRD release described in Sections 5.4.4 and 5.4.5, and any release in excess of the reportable quantity limits as stipulated in 40 CFR, Part 117, Part 302 and Part 355, including any release in excess of 100 pounds of VOC, within one hour of such occurrence or within one hour of the time said person knew or reasonably should have known of its occurrence. This requirement applies only to any process PRD that is vented to atmosphere. [District Rule 4455, 6.3.1] Federally Enforceable Through Title V Permit

119. The operator shall submit a written report to the APCO within thirty (30) calendar days following a PRD release subject to 6.3.1. The written report shall include 1) process PRD type, size, and location, 2) date, time and duration of the process PRD release, 3) types of VOC released and individual amounts, in pounds, including supporting calculations, 4) cause of the process PRD release, and 5) corrective actions taken to prevent a subsequent process PRD release. This requirement applies only to any process PRD that is vented to atmosphere. [District Rule4455 6.3.2] Federally Enforceable Through Title V Permit

120. Copies of all records shall be retained for a minimum of five (5) years after the date of an entry. Such records shall be made available to the APCO, ARB, or US EPA upon request. [District Rule 4455, 6.2.2, 6.2.3 & 6.2.4] Federally Enforceable Through Title V Permit

121. Measurements of gaseous leak concentrations shall be conducted according to US EPA Method 21 using an appropriate portable hydrocarbon detection instrument calibrated with methane. The instrument shall be calibrated in accordance with the procedures specified in US EPA Method 21 or the manufacturer's instruction, as appropriate, not more than 30 days prior to its use. The operator shall record the calibration date of the instrument. [District Rule 4455, 6.4.1] Federally Enforceable Through Title V Permit

122. The VOC content shall be determined using American Society of Testing and Materials (ASTM) D 1945 for gases and South Coast Air Quality Management District (SCAQMD) Method 304-91 for liquids. [District Rule 4455, 6.4.2] Federally Enforceable Through Title V Permit

123. The percent by volume liquid evaporated at 150 C shall be determined using ASTM D 86. [District Rule 4455, 6.4.3] Federally Enforceable Through Title V Permit

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

DRAFT

PERMIT NO: S-33-413-0 **ISSUANCE DATE:** DRAFT

LEGAL OWNER OR OPERATOR: BIG WEST OF CA, LLC
MAILING ADDRESS: 6451 ROSEDALE HWY (AREA 1 & 2)
BAKERSFIELD, CA 93308

LOCATION: 6451 ROSEDALE HWY (AREA 1 & 2)
BAKERSFIELD, CA 93308

EQUIPMENT DESCRIPTION:
GROUND LEVEL FLARE WITH LOW PRESSURE SECTION WITH AIR-ASSIST, MULTIPLE CALLIDUS MODEL BTZ-MP BURNERS (OR EQUIVALENT) AND A MAXIMUM GAS THROUGHPUT RATING OF 21 MM ACF/HR, MULTI-STAGE HIGH PRESSURE SECTION WITH MULTIPLE CALLIDUS MODEL BTZ-MP BURNERS (OR EQUIVALENT) AND A MAXIMUM GAS THROUGHPUT RATING OF 1.4 MM ACF/HR AND FLARE GAS RECOVERY SYSTEM

CONDITIONS

1. {1829} The facility shall submit an application to modify the Title V permit in accordance with the timeframes and procedures of District Rule 2520. [District Rule 2520] Federally Enforceable Through Title V Permit
2. This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District Rule 2201] Federally Enforceable Through Title V Permit
3. Flare shall be equipped with a flare gas recovery system that continuously recovers all gases except gases released during emergencies, as defined below, and gases released during the startup/shutdown of the process equipment connected to this device. Flare gas recovery system shall include two electric compressors having a total nominal design capacity of at least 500 cfm. At least one compressor shall be operating whenever vapors are present in the flare gas recovery system. Compressors shall discharge to the low pressure amine absorber listed in S-33-408. [District Rule 2201] Federally Enforceable Through Title V Permit
4. Permittee shall obtain APCO approval for the use of any equivalent burner not specifically approved by this ATC document prior to installation. Approval of any equivalent burner shall be made by the APCO's determination that the submitted design and performance data for alternate burner are equivalent to an approved burner. [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 326-6900 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director / APCO

DRAFT

DAVID WARNER, Director of Permit Services

5. Permittee's request for approval of an equivalent burner shall include at minimum the following information: burner manufacturer and model number, maximum heat input rating, manufacturer's performance and design specifications and manufacturer's burner drawings. [District Rule 2201] Federally Enforceable Through Title V Permit

6. Permittee shall submit to the District final design details for flare, flare gas recovery system and continuous emission monitors required for this unit, at least 30 days prior to initiation of construction on this unit. [District Rule 2201] Federally Enforceable Through Title V Permit

7. Flare shall serve the following process units: S-33-407 (HGU2), S-33-408 (VGO-HDS), S-33-409 (SWAATS), S-33-410 (FCCU) and S-33-411 (LPG-Merox and Alkylation Units). [District Rule 2201] Federally Enforceable Through Title V Permit

8. Flare shall only be used during emergencies, as defined below, and during the startup/shutdown of process equipment listed above. [District Rule 2201] Federally Enforceable Through Title V Permit

9. Emergency shall be defined as an unforeseeable failure or malfunction of operating equipment that 1) does not exceed 24 hours duration; 2) is not due to neglect or disregard of air pollution laws or rules; 3) is not intentional or the result of negligence; 4) is not due to improper maintenance; 5) does not constitute a nuisance; and 6) is not a recurrent breakdown of the same equipment. [District Rule 2201] Federally Enforceable Through Title V Permit

10. Permittee shall report to the District in writing within ten days following the emergency use of the flare. The report shall include 1) a statement that the failure or malfunction has been corrected, the date corrected, and proof of correction; 2) a specific statement of the reason or cause for the occurrence; 3) a description of the corrective measures undertaken and/or to be undertaken to avoid such an occurrence in the future; and 4) an estimate of the emissions caused by the emergency use. [District Rule 1100] Federally Enforceable Through Title V Permit

11. Permittee shall notify the District of any emergency use of the flare as soon as reasonably possible, but no later than one hour after initiation of its use unless the owner or operator demonstrates to the District's satisfaction that a longer notification period was necessary. [District Rule 1100] Federally Enforceable Through Title V Permit

12. Heat input of the pilot gas combusted in this flare shall not exceed 72 MM Btu/day. [District Rule 2201] Federally Enforceable Through Title V Permit

13. Heat input of gas combusted in this flare during planned startup and shutdowns shall not exceed 2,268.6 MM Btu/day and 2,268.6 MM Btu/yr. [District 2201 Rule] Federally Enforceable Through Title V Permit

14. Sulfur content of pilot gas combusted in this unit used shall not exceed 40 ppmv (measured as H2S), based on a 4-hour rolling average basis. [District Rule 2201] Federally Enforceable Through Title V Permit

15. The operator shall not burn in any fuel gas combustion device any fuel that contains hydrogen sulfide (H2S) in excess of 162 ppmv determined hourly on a 3 hour rolling average basis and H2S in excess of 60 ppmv determined daily on a 365 successive calendar day rolling average basis. The combustion in this flare of process upset gases (as defined in 40 CFR Part 60 Subpart Ja) or fuel gas that is released during an emergency is exempt from these limits. [40 CFR 60.102a(g)(1)(ii)] Federally Enforceable Through Title V Permit

16. A continuous emissions monitoring system for fuel gas (pilot gas) H2S shall be installed, calibrated, operated, and reported according to EPA guidelines as specified under 40 CFR 60.107a(a)(2). CEM results shall be calculated on a rolling three (3) hour basis. Continuous monitoring for pilot gas H2S concentration is not required if the pilot is supplied with natural gas from a regulated source. [40 CFR 60, 60.107a(a)(2)] Federally Enforceable Through Title V Permit

17. Sulfur oxide emissions (as SO2) from the gas combusted in this unit shall not exceed any of the following: 100 lb/hr, 100 lb/day or 396 lb/yr. The combustion in this flare of process upset gases (as defined in 40 CFR Part 60 Subpart Ja) or fuel gas that is released during an emergency is exempt from these limits. [District Rule 2201]

18. The operator shall install, operate, calibrate and maintain an instrument for continuously monitoring and recording the concentration of reduced sulfur in the flare gas. Instrument shall be installed, operated and maintained in accordance with Performance Specification 5 of Appendix B to Part 60. [40 CFR Part 60.107a(d)] Federally Enforceable Through Title V Permit

19. Emission rates shall not exceed any of the following: NOx (as NO2): 0.068 lb/MM Btu, PM-10: 0.008 lb/MMBtu, CO: 0.370 lb/MMBtu or VOC: 0.063 lb/MMBtu [District Rule 2201] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

20. Fugitive VOC emissions from components associated with this unit shall not exceed 6.9 lb/day. [District Rule 2201] Federally Enforceable Through Title V Permit

21. Prior to operating equipment under this Authority to Construct, permittee shall surrender emission reduction credits to offset the calendar quarter emissions increases set forth below, at the distance offset ratio specified in Rule 2201 (as amended 12/15/05) Table 4.2 and the interpollutant offset ratio specified in this permit, NOx - Q1: 485 lb, Q2: 485 lb, Q3: 485 lb and Q4: 485 lb; SOx (as SO2) - Q1: 99 lb, Q2: 99 lb, Q3: 99 lb and Q4: 99 lb; PM10 - Q1: 57 lb, Q2: 57 lb, Q3: 57 lb, and Q4: 57 lb; CO - Q1: 2,641 lb, Q2: 2,641 lb, Q3: 2,641 lb and Q4: 2,641 lb, and VOC - Q1: 1080 lb, Q2: 1080 lb, Q3: 1080 lb and Q4: 1080 lb. [District Rule 2201] Federally Enforceable Through Title V Permit

22. ERC Certificate Number S-2183-2 (or certificates split from this certificate) shall be used to supply the required NOx and PM10 offsets, ERC Certificate Number S-2178-3 (or a certificate split from this certificate) shall be used to supply the required CO offsets, ERC Certificate Number S-2452-1 (or a certificate split from this certificate) shall be used to supply the required VOC offsets and ERC Certificate Numbers S-2177-5 and/or S-2184-5 (or certificates split from these certificates) shall be used to supply the required SOx, unless a revised offsetting proposal is received and approved by the District, upon which this Authority to Construct shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of this Authority to Construct. [District Rule 2201] Federally Enforceable Through Title V Permit

23. NOx ERCs may be used to offset PM10 emission increases at a ratio of 2.16 lb NOx : 1 lb PM10. [District Rule 2201] Federally Enforceable Through Title V Permit

24. Mass or volumetric fuel flow meters to measure the amounts of flare gas and pilot gas combusted shall be installed, utilized and maintained. A fuel flow meter is not required to measure the pilot gas provided the pilot gas is from a regulated source and an alternate method for determining the amount of pilot gas combusted is approved by the APCO. [District Rules 2201 and 40 CFR 60.107a(e)] Federally Enforceable Through Title V Permit

25. Unless supplied with natural gas from a regulated source, permittee shall obtain and analyze a representative sample for total reduced sulfur of the pilot fuel combusted in this unit, at least once per week for an initial period of six weeks and at least once every six months thereafter. Samples shall be analysed using ASTM Test Method D6228-98, D4468-85 or D1072-06, or an alternative analytical method approved in advance by the APCO. [District Rule 2201] Federally Enforceable Through Title V Permit

26. Within 90 days of commencement of normal, continuous operation of this unit, operator shall inspect all components for leaks using a portable hydrocarbon detection instrument and the methods specified in Section 6.4.1 of Rule 4455, except for those components that are specifically exempted from the requirements of Rule 4455. [District Rule 2201] Federally Enforceable Through Title V Permit

27. Operator shall demonstrate compliance with fugitive VOC emissions limit of this permit within 60 days after the completion of the initial inspection of components and annually thereafter within 60 days after completion of the annual inspection of components required by Rule 4455. Compliance shall be demonstrated by calculation, using the correlation equations, zero default and 10,000 ppmv pegged factors set forth in the CAPCOA California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities, Table IV-3a, February 1999, and the average emission concentrations of total organic compounds measured for each component during all inspections conducted during the prior 365 day period. [District Rule 2201] Federally Enforceable Through Title V Permit

28. The flare shall be operated according to the manufacturer's specifications, a copy of which shall be maintained on site. [District Rule 40CFR 60.18(d)] Federally Enforceable Through Title V Permit

29. Visible emissions monitoring shall be conducted at least annually, using EPA Method 22. [40CFR 60.18(f)(1)] Federally Enforceable Through Title V Permit

30. Each flare outlet shall operate with a pilot flame present at all times when combustible gases are vented through that flare outlet. [District Rule 4311, 5.3 and 40CFR 60.18(f)(2)] Federally Enforceable Through Title V Permit

31. At each flare outlet, a heat sensing device such as a thermocouple, ultraviolet beam sensor, infrared sensor, or an equivalent device, capable of continuously detecting if at least one pilot flame or the flare flame is present, shall be installed and operated. [District Rule 4311, 5.4 and 40CFR 60.18(f)(2)] Federally Enforceable Through Title V Permit

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32. Operator shall report all rolling 3-hour periods during which the average concentration of H2S as measured by the H2S continuous monitoring system exceeds 162 ppmv and all rolling 365-day periods during which the average concentration of H2S as measured by the H2S continuous monitoring system exceeds 60 ppmv. [40 CFR 60.107a(f)] Federally Enforceable Through Title V Permit

33. Operator shall determine compliance with the H2S standard using EPA Methods 11, 15, 15A, or 16. [40 CFR 60.106(e)] Federally Enforceable Through Title V Permit

34. Operator shall maintain records of the heating values (Btu/scf) and total heat inputs (MM Btu/yr) to the flare of pilot gas and gases combusted during startup/shutdown events. Records of the heating value and total heat input of pilot gas are not required if the pilot gas is from a regulated source and an alternate method of determining the quantity of pilot gas has been approved by the APCO. Records shall be maintained for a period of 5 years and shall be made available to the District upon request. [District Rule 2201]

35. Operator shall develop and implement a written flare management plan prior to first operation of this device. The plan shall include at a minimum, the items listed in 40 CFR 60.103a(a)(1) through (6). [40 CFR 60.103a(a)]

36. Operator shall conduct a root cause analysis of any emission limit exceedance or process start-up, shutdown, upset, or malfunction that causes a discharge to the atmosphere in excess of 500 lb/day of SO2. For any root cause analysis performed, the owner or operator shall record the identification of the affected facility, the date and duration of the discharge, the results of the root cause analysis, and the action taken as a result of the root cause analysis. [40 CFR 60.103a(b)] Federally Enforceable Through Title V Permit

37. The owner or operator shall comply with the requirements 40 CFR 60.482-1 to 40 CFR 60.482-10 as soon as practical, but no later than 180 days after initial start. [40 CFR 60.592(a)] Federally Enforceable Through Title V Permit

38. Each pump in light liquid service (PLLS) shall be monitored monthly to detect leaks by the methods specified in 40 CFR 60.485(b), except as provided in 40 CFR 60.482-1(c) and 40 CFR 60.482-2(d), (e), and (f). Each pump in light liquid service shall be checked by visual inspection each calendar week for indications of liquids dripping from the pump seal. A leak is detected if an instrument reading of 10,000 ppm or greater is measured or if there are indications of liquids dripping from the pump seal. [40 CFR 60.482-2(a) and (b)] Federally Enforceable Through Title V Permit

39. When a leak is detected for each PLLS, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in 40 CFR 60.482-9. A first attempt at repair shall be made no later than 5 calendar days after each leak is detected. [40 CFR 60.482-2(c)] Federally Enforceable Through Title V Permit

40. Each PLLS equipped with a dual mechanical seal system that includes a barrier fluid system is exempt from the requirements of 40 CFR 60.482-2(a) provided the requirements specified in 40 CFR 60.482-2(d)(1) through (6) are met. [40 CFR 60.482(d)] Federally Enforceable Through Title V Permit

41. Any PLLS that is designated, as described in 40 CFR 60.486(e)(1) and (2), for no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, is exempt from the requirements of 40 CFR 60.482-2(a), (c), and (d) if the pump meets the requirements specified in 40 CFR 60.482-2(e)(1), (2), and (3). [40 CFR 60.482-2(e)] Federally Enforceable Through Title V Permit

42. If any PLLS is equipped with a closed vent system capable of capturing and transporting leakage from the seal or seals to a control device that complies with the requirements of 40 CFR 60.482-10, it is exempt from the requirements of 40 CFR 60.482-2(a) through (e). [40 CFR 60.482-2(f)] Federally Enforceable Through Title V Permit

43. Any pump in PLLS that is designated, as described in 40 CFR 60.486(f)(1), as an unsafe-to-monitor pump is exempt from the monitoring and inspection requirements of 40 CFR 60.482-2(a) and 40 CFR 60.482-2(d)(4) through (6) if: 1). The owner or operator of the pump demonstrates that the pump is unsafe-to-monitor because monitoring personnel would be exposed to an immediate danger as a consequence of complying with 40 CFR 60.482-2(a); and 2) The owner or operator of the pump has a written plan that requires monitoring of the pump as frequently as practicable during safe-to-monitor times but not more frequently than the periodic monitoring schedule otherwise applicable, and repair of the equipment according to the procedures in 40 CFR 60.482-2(c) if a leak is detected. [40 CFR 60.482-2(g)] Federally Enforceable Through Title V Permit

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44. Except for in-situ sampling systems and sampling systems without purges, each sampling connection system shall be equipped with a closed-purge, closed-loop, or closed-vent system, except as provided in 40 CFR 60.482-1(c). Each closed-purge, closed-loop, or closed-vent system shall comply with the requirements specified in 40 CFR 60.482-5(b)(1), (2), (3), and (4). [40 CFR 60.482-5(a), (b), and (c)] Federally Enforceable Through Title V Permit

45. Each open-ended valve or line shall be equipped with a cap, blind flange, plug, or a second valve, except as provided in 40 CFR 60.482-1(c). The cap, blind flange, plug, or second valve shall seal the open end at all times except during operations requiring process fluid flow through the open-ended valve or line. When a double block-and-bleed system is being used, the bleed valve or line may remain open during operations that require venting the line between the block valves but shall comply with this condition at all other times. [40 CFR 60.482-6(a) and (c)] Federally Enforceable Through Title V Permit

46. Each open-ended valve or line equipped with a second valve shall be operated in a manner such that the valve on the process fluid end is closed before the second valve is closed. [40 CFR 60.482-6(b)] Federally Enforceable Through Title V Permit

47. Each valve in gas/vapor service and in light liquid service shall be monitored monthly to detect leaks by the methods specified in 40 CFR 60.485(b) and shall comply with 40 CFR 60.482-7(b) through (e), except as provided in 40 CFR 60.482-7(f), (g), and (h), 40 CFR 60.483-1, 40 CFR 60.483-2, and 40 CFR 60.482-1(c). A leak is detected if an instrument reading of 10,000 ppm or greater is measured. [40 CFR 60.482-7(a) and (b)] Federally Enforceable Through Title V Permit

48. Any valve in gas/vapor service or in light liquid service for which a leak is not detected for 2 successive months may be monitored the first month of every quarter, beginning with the next quarter, until a leak is detected. If a leak is detected, the valve shall be monitored monthly until a leak is not detected for 2 successive months. [40 CFR 60.482-7(c)] Federally Enforceable Through Title V Permit

49. When a leak is detected for any valve in gas/vapor service or in light liquid service, it shall be repaired as soon as practicable, but no later than 15 calendar days after the leak is detected, except as provided in 40 CFR 60.482-9. A first attempt at repair shall be made no later than 5 calendar days after each leak is detected. First attempts at repair include, but are not limited to, the best practices specified in 40 CFR 60.482-7(e)(1), (2), (3), and (4), where practicable. [40 CFR 60.482-7(d) and (e)] Federally Enforceable Through Title V Permit

50. If evidence of a potential leak is found by visual, audible, olfactory, or any other detection method at pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and connectors, the owner or operator shall follow either one of the following procedures: 1) The owner or operator shall monitor the equipment within 5 days by the method specified in 40 CFR 60.485(b) and shall comply with the requirements of 40 CFR 60.482-8(b) through (d); or 2) The owner or operator shall eliminate the visual, audible, olfactory, or other indication of a potential leak. A leak is detected if an instrument reading of 10,000 ppm or greater is measured. [40 CFR 60.482-8(a) and (b)] Federally Enforceable Through Title V Permit

51. When a leak is detected in pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and connectors, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in 40 CFR 60.482-9. The first attempt at repair shall be made no later than 5 calendar days after each leak is detected. First attempts at repair include, but are not limited to, the best practices described under 40 CFR 60.482-7(e). [40 CFR 60.482-8(c) and (d)] Federally Enforceable Through Title V Permit

52. Except as provided in 40 CFR 60.482-10(i) through (k), each closed vent system used to comply with the provisions of Subpart GGG shall be inspected according to the procedures and schedule specified in 40 CFR 60.482-10(f)(1) and (f)(2). Leaks, as indicated by an instrument reading greater than 500 parts per million by volume above background or by visual inspections, shall be repaired as soon as practicable except as provided in 40 CFR 60.482-10(h). A first attempt at repair shall be made no later than 5 calendar days after the leak is detected. Repair shall be completed no later than 15 calendar days after the leak is detected. [40 CFR 60.482-10(f) and (g)] Federally Enforceable Through Title V Permit

53. Delay of repair of a closed vent system for which leaks have been detected is allowed if the repair is technically infeasible without a process unit shutdown or if the owner or operator determines that emissions resulting from immediate repair would be greater than the fugitive emissions likely to result from delay of repair. Repair of such equipment shall be complete by the end of the next process unit shutdown. [40 CFR 60.482-10(h)] Federally Enforceable Through Title V Permit

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54. The owner or operator shall record the following information: 1) Identification of all parts of the closed vent system that are designated as unsafe to inspect, an explanation of why the equipment is unsafe to inspect, and the plan for inspecting the equipment; 2) Identification of all parts of the closed vent system that are designated as difficult to inspect, an explanation of why the equipment is difficult to inspect, and the plan for inspecting the equipment; 3) For each inspection during which a leak is detected, a record of the information specified in 40 CFR 60.486(c); 4) For each inspection conducted in accordance with 40 CFR 60.485(b) during which no leaks are detected, a record that the inspection was performed, the date of the inspection, and a statement that no leaks were detected; and 5) For each visual inspection conducted in accordance with 40 CFR 60.482-10(f)(1)(ii) during which no leaks are detected, a record that the inspection was performed, the date of the inspection, and a statement that no leaks were detected. [40 CFR 60.482-10(l)] Federally Enforceable Through Title V Permit

55. Closed vent systems and control devices used to comply with provisions Subpart GGG shall be operated at all times when emissions may be vented to them. [40 CFR 60.482-10(m)] Federally Enforceable Through Title V Permit

56. In conducting the performance tests required in 40 CFR 60.8, the owner or operator shall use as reference methods and procedures the test methods in 40 CFR 60, Appendix A or other methods and procedures as specified in 40 CFR 60.485, except as provided in 40 CFR 60.8(b). [40 CFR 60.485(a)] Federally Enforceable Through Title V Permit

57. The owner or operator shall determine compliance with the standards in 40 CFR 60.482, 60.483, and 60.484 as follows: Method 21 shall be used to determine the presence of leaking sources. The instrument shall be calibrated before use each day of its use by the procedures specified in Method 21. The following calibration gases shall be used: (i) Zero air (less than 10 ppm of hydrocarbon in air); and (ii) A mixture of methane or n-hexane and air at a concentration of about, but less than, 10,000 ppm methane or n-hexane. [40 CFR 60.485(b)] Federally Enforceable Through Title V Permit

58. The owner or operator shall determine compliance with the no detectable emission standards in 40 CFR 60.482-2(e), 60.482-3(i), 60.482-4, 60.482-7(f), and 60.482-10(e) as follows: 1) The requirements of 40 CFR 60.485(b) shall apply. 2) Method 21 shall be used to determine the background level. All potential leak interfaces shall be traversed as close to the interface as possible. The arithmetic difference between the maximum concentration indicated by the instrument and the background level is compared with 500 ppm for determining compliance. [40 CFR 60.485(c)] Federally Enforceable Through Title V Permit

59. The owner or operator shall test each piece of equipment unless demonstrated that a process unit is not in VOC service, i.e., that the VOC content would never be reasonably expected to exceed 10 percent by weight. For purposes of this demonstration, the following methods and procedures shall be used: 1) Procedures that conform to the general methods in ASTM E260-73, 91, or 96, E168-67, 77, or 92, E169-63, 77, or 93 (incorporated by reference as seen in 40 CFR 60.17) shall be used to determine the percent VOC content in the process fluid that is contained in or contacts a piece of equipment; 2) Organic compounds that are considered by the Administrator to have negligible photochemical reactivity may be excluded from the total quantity of organic compounds in determining the VOC content of the process fluid; and 3) Engineering judgment may be used to estimate the VOC content, if a piece of equipment had not been shown previously to be in service. If the Administrator disagrees with the judgment, the previous two procedures as specified in 40 CFR 60.485(d)(1) and (2) shall be used to resolve the disagreement. [40 CFR 60.485(d)] Federally Enforceable Through Title V Permit

60. The owner or operator shall demonstrate that an equipment is in light liquid service by showing that all the following conditions apply: 1) The vapor pressure of one or more of the components is greater than 0.3 kPa at 20 °C (1.2 in. H2O at 68 degrees F). Standard reference texts or ASTM D2879-83, 96, or 97 (incorporated by reference as seen in 40 CFR 60.17) shall be used to determine the vapor pressures; 2) The total concentration of the pure components having a vapor pressure greater than 0.3 kPa at 20 degrees Celsius is equal to or greater than 20 percent by weight; and 3) The fluid is a liquid at operating conditions. [40 CFR 60.485(e)] Federally Enforceable Through Title V Permit

61. Samples used in conjunction with 40 CFR 60.485(d), (e), and (g) shall be representative of the process fluid that is contained in or contacts the equipment or the gas being combusted in the flare. [40 CFR 60.485(f)] Federally Enforceable Through Title V Permit

62. An owner or operator of more than one affected facility subject to the provisions Subpart GGG may comply with the recordkeeping requirements for these facilities in one recordkeeping system if the system identifies each record by each facility. [40 CFR 60.486(a)] Federally Enforceable Through Title V Permit

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63. When each leak is detected as specified in 40 CFR 60.482-2, 60.482-3, 60.482-7, 60.482-8, and 60.483-2, the following requirements apply: 1) A weatherproof and readily visible identification, marked with the equipment identification number, shall be attached to the leaking equipment; 2) The identification on a valve may be removed after it has been monitored for 2 successive months as specified in 40 CFR 60.482-7(c) and no leak has been detected during those 2 months; and 3) The identification on equipment except on a valve, may be removed after it has been repaired. [40 CFR 60.486(b)] Federally Enforceable Through Title V Permit

64. When each leak is detected as specified in 40 CFR 60.482-2, 60.482-3, 60.482-7, 60.482-8, and 60.483-2, the following information shall be recorded in a log and shall be kept for 5 years in a readily accessible location: 1) The instrument and operator identification numbers and the equipment identification number; 2) The date the leak was detected and the dates of each attempt to repair the leak; 3) Repair methods applied in each attempt to repair the leak; 4) ``Above 10,000'' if the maximum instrument reading measured by the methods specified in 40 CFR 60.485(a) after each repair attempt is equal to or greater than 10,000 ppm; 5) ``Repair delayed'' and the reason for the delay if a leak is not repaired within 15 calendar days after discovery of the leak; 6) The signature of the owner or operator (or designate) whose decision it was that repair could not be effected without a process shutdown; 7) The expected date of successful repair of the leak if a leak is not repaired within 15 days; 8) Dates of process unit shutdown that occur while the equipment is unrepaired; and 9) The date of successful repair of the leak. [40 CFR 60.486(c) and District Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit

65. The following information pertaining to the design requirements for closed vent systems and control devices described in 40 CFR 60.482-10 shall be recorded and kept in a readily accessible location: 1) Detailed schematics, design specifications, and piping and instrumentation diagrams; 2) The dates and descriptions of any changes in the design specifications; 3) A description of the parameter or parameters monitored, as required in 40 CFR 60.482-10(e), to ensure that control devices are operated and maintained in conformance with their design and an explanation of why that parameter (or parameters) was selected for the monitoring; 4) Periods when the closed vent systems and control devices required in 40 CFR 60.482-2, 60.482-3, 60.482-4, and 60.482-5 are not operated as designed, including periods when a flare pilot light does not have a flame; and 5) Dates of startups and shutdowns of the closed vent systems and control devices required in 40 CFR 60.482-2, 60.482-3, 60.482-4, and 60.482-5. [40 CFR 60.486(d)] Federally Enforceable Through Title V Permit

66. The following information pertaining to all equipment subject to the requirements in 40 CFR 60.482-1 to 60.482-10 shall be recorded in a log that is kept in a readily accessible location: 1) A list of identification numbers for equipment subject to the requirements of Subpart GGG; 2) (i) A list of identification numbers for equipment that are designated for no detectable emissions under the provisions of 40 CFR 60.482-2(e), 60.482-3(i) and 60.482-7(f). (ii) The designation of equipment as subject to the requirements of 40 CFR 60.482-2(e), 60.482-3(i) and 60.482-7(f) shall be signed by the owner or operator; 3) A list of equipment identification numbers for pressure relief devices required to comply with §60.482-4; 4) (i) The dates of each compliance test as required in 40 CFR 60.482-2(e), 60.482-3(i), §60.482-4, and 60.482-7(f). (ii) The background level measured during each compliance test. (iii) The maximum instrument reading measured at the equipment during each compliance test; and 5) A list of identification numbers for equipment in vacuum service. [40 CFR 60.486(e)] Federally Enforceable Through Title V Permit

67. The following information pertaining to all valves subject to the requirements of 40 CFR 60.482-7(g) and (h) and to all pumps subject to the requirements of 40 CFR 60.482-2(g) shall be recorded in a log that is kept in a readily accessible location: 1) A list of identification numbers for valves and pumps that are designated as unsafe-to-monitor, an explanation for each valve or pump stating why the valve or pump is unsafe-to-monitor, and the plan for monitoring each valve or pump; and 2) A list of identification numbers for valves that are designated as difficult-to-monitor, an explanation for each valve stating why the valve is difficult-to-monitor, and the schedule for monitoring each valve. [40 CFR 60.486(f)] Federally Enforceable Through Title V Permit

68. The following information shall be recorded for valves complying with 40 CFR 60.483-2: 1) A schedule of monitoring; 2) The percent of valves found leaking during each monitoring period. [40 CFR 60.486(g)] Federally Enforceable Through Title V Permit

69. The following information shall be recorded in a log that is kept in a readily accessible location: 1) Design criterion required in 40 CFR 60.482-2(d)(5) and 60.482-3(e)(2) and explanation of the design criterion; and 2) Any changes to this criterion and the reasons for the changes. [40 CFR 60.486(h)] Federally Enforceable Through Title V Permit

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70. The following information shall be recorded in a log that is kept in a readily accessible location for use in determining exemptions as provided in 40 CFR 60.480(d): 1) An analysis demonstrating the design capacity of the affected facility; 2) A statement listing the feed or raw materials and products from the affected facilities and an analysis demonstrating whether these chemicals are heavy liquids or beverage alcohol; and 3) An analysis demonstrating that equipment is not in VOC service. [40 CFR 60.486(i)] Federally Enforceable Through Title V Permit

71. Information and data used to demonstrate that a piece of equipment is not in VOC service shall be recorded in a log that is kept in a readily accessible location. [40 CFR 60.486(j)] Federally Enforceable Through Title V Permit

72. All semiannual reports to the Administrator shall include the following information, summarized from the information in 40 CFR 60.486: 1) Process unit identification; 2) For each month during the semiannual reporting period, i) Number of valves for which leaks were detected as described in 40 CFR 60.482-7(b) or 40 CFR 60.483-2, (ii) Number of valves for which leaks were not repaired as required in 40 CFR 60.482-7(d)(1), (iii) Number of pumps for which leaks were detected as described in 40 CFR 60.482-2(b) and (d)(6)(i), (iv) Number of pumps for which leaks were not repaired as required in 40 CFR 60.482-2(c)(1) and (d)(6)(ii), (v) Number of compressors for which leaks were detected as described in 40 CFR 60.482-3(f), (vi) Number of compressors for which leaks were not repaired as required in 40 CFR 60.482-3(g)(1), and (vii) The facts that explain each delay of repair and, where appropriate, why a process unit shutdown was technically infeasible; 3) Dates of process unit shutdowns which occurred within the semiannual reporting period; 4) Revisions to items reported in the semiannual report if changes have occurred since the initial report, as required in 40 CFR 60.487 (a) and (b), or subsequent revisions to the initial report. [40 CFR 60.487(c)] Federally Enforceable Through Title V Permit

73. An owner or operator electing to comply with the provisions of 40 CFR 60.483-1 and 60.483-2 shall notify the Administrator of the alternative standard selected 90 days before implementing either of the provisions. [40 CFR 60.487(d)] Federally Enforceable Through Title V Permit

74. An owner or operator shall report the results of all performance tests in accordance with 40 CFR 60.8 of the General Provisions. The provisions of 40 CFR 60.8(d) do not apply to affected facilities subject to the provisions of Subpart GGG except that an owner or operator must notify the Administrator of the schedule for the initial performance tests at least 30 days before the initial performance tests. [40 CFR 60.487(e)] Federally Enforceable Through Title V Permit

75. The operator shall maintain all records of required monitoring data and support information for inspection at any time for a period of five years. [District Rule 2520, 9.4.2] Federally Enforceable Through Title V Permit

76. A component shall be considered leaking if one or more of the conditions specified in Sections 5.1.4.1 through 5.1.4.4 of Rule 4455 exist at the facility. For this permit unit, except for pumps and compressors, a minor gas leak shall be defined for any component listed in Rule 4455 Section 3.22 Table 1 in either liquid or gas/vapor service as a reading in excess of 100 ppmv above background up to and including a reading of 10,000 ppmv above background. For pumps, compressors and other component types not specifically listed in Rule 4455 Section 3.22 Table 1 in either liquid or gas/vapor service, a minor gas leak shall be defined as a reading in excess of 500 ppmv above background up to and including a reading of 10,000 ppmv above background. Readings shall be taken as methane using a portable hydrocarbon detection instrument and shall be made in accordance with the methods specified in Section 6.4.1 of Rule 4455. [District Rules 2201 and 4455, 5.1.4] Federally Enforceable Through Title V Permit

77. The operator shall not use any component that leaks in excess of the allowable leak standards of Rule 4455, or is found to be in violation of the provisions specified in Section 5.1.3. A component identified as leaking in excess of an allowable leak standard may be used provided it has been identified with a tag for repair, has been repaired, or is awaiting re-inspection after repair, within the applicable time period specified within the rule. [District Rule Rule 4455, 5.1.1] Federally Enforceable Through Title V Permit

78. Each hatch shall be closed at all times except during sampling or adding of process material through the hatch, or during attended repair, replacement, or maintenance operations, provided such activities are done as expeditiously as possible and with minimal spillage of material and VOC emissions to the atmosphere. [District Rule 4455, 5.1.2] Federally Enforceable Through Title V Permit

79. The operator shall be in violation of Rule 4455 if any District inspection demonstrates that one or more of the conditions in Sections 5.1.4 exist at the facility. [District Rule 4455, 5.1.3.1] Federally Enforceable Through Title V Permit

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80. Except for annual operator inspection described in Section 5.1.3.2.3, any operator inspection that demonstrates that one or more of the conditions in Section 5.1.4 exist at the facility shall not constitute a violation of Rule 4455 if the leaking components are repaired as soon as practicable but not later than the time frame specified in Rule 4455. Such components shall not be counted towards determination of compliance with the provisions of Section 5.1.4. [District Rule 4455, 5.1.3.2.1] Federally Enforceable Through Title V Permit

81. Leaking components detected during operator inspection pursuant Section 5.1.3.2.1 that are not repaired, replaced, or removed from operation as soon as practicable but not later than the time frame specified in Rule 4455 shall be counted toward determination of compliance with the provisions of Section 5.1.4. [District Rule 4455, 5.1.3.2.2] Federally Enforceable Through Title V Permit

82. Any operator inspection conducted annually for a component type (including operator annual inspections pursuant to Section 5.2.5, 5.2.6, 5.2.7, or 5.2.8) that demonstrates one or more of the conditions in Section 5.1.4 exist at the facility shall constitute a violation of Rule 4455 regardless of whether or not the leaking components are repaired, replaced, or removed from operation within the allowable repair time frame specified in Rule 4455. [District Rule 4455, 5.1.3.2.3] Federally Enforceable Through Title V Permit

83. The operator shall audio-visually inspect for leaks all accessible operating pumps, compressors and Pressure Relief Devices (PRDs) in service at least once every 24 hours, except when operators do not report to the facility for that given 24 hours. Any identified leak that cannot be immediately repaired shall be reinspected within 24 hours using a portable analyzer. If a leak is found, it shall be repaired as soon as practical but not later than the time frame specified in Table 3. [District Rule 4455, 5.2.1 & 5.2.2] Federally Enforceable Through Title V Permit

84. The operator shall inspect all components at least once every calendar quarter, except for inaccessible components, unsafe-to-monitor components and pipes. Inaccessible components, unsafe-to-monitor components and pipes shall be inspected in accordance with the requirements set forth in Sections 5.2.5, 5.2.6, and 5.2.7. New, replaced, or repaired fittings, flanges and threaded connections shall be inspected immediately after being placed into service. Components shall be inspected using EPA Method 21. [District Rule 4455, 5.2.3, 5.2.4, 5.2.5, 5.2.6 & 5.2.7] Federally Enforceable Through Title V Permit

85. The operator may apply for a written approval from the APCO to change the inspection frequency from quarterly to annually for a component type, provided the operator meets all the criteria specified in Sections 5.2.8.1 through 5.2.8.3. This approval shall apply to accessible component types, specifically designated by the APCO, except pumps, compressors, and PRDs which shall continue to be inspected on a quarterly basis. [District Rule 4455, 5.2.8] Federally Enforceable Through Title V Permit

86. An annual inspection frequency approved by the APCO shall revert to quarterly inspection frequency for a component type if either the operator inspection or District inspection demonstrates that a violation of the provisions of Sections 5.1, 5.2 and 5.3 of the rule exists for that component type, or the APCO issued a Notice of Violation for violating any of the provisions of Rule 4455 during the annual inspection period for that component type. When the inspection frequency changes from annual to quarterly inspections, the operator shall notify the APCO in writing within five (5) calendar days after changing the inspection frequency, giving the reason(s) and date of change to quarterly inspection frequency. [District Rule 4455, 5.2.9 & 5.2.10] Federally Enforceable Through Title V Permit

87. The operator shall initially inspect a process PRD that releases to the atmosphere as soon as practicable but not later than 24 hours after the time of the release. To insure that the process PRD is operating properly, and is leak-free, the operator shall re-inspect the process PRD not earlier than 24 hours after the initial inspection but not later than 15 calendar days after the date of the release using EPA Method 21. If the process PRD is found to be leaking at either inspection, the PRD leak shall be treated as if the leak was found during quarterly operator inspections. [District Rule 4455, 5.2.11] Federally Enforceable Through Title V Permit

88. Except for process PRD, a component shall be inspected within 15 calendar days after repairing the leak or replacing the component using EPA Method 21. [District Rule 4455, 5.2.12] Federally Enforceable Through Title V Permit

89. Upon detection of a leaking component, the operator shall affix to that component a weatherproof readily visible tag that contains the information specified in Section 5.3.3. The tag shall remain affixed to the component until the leaking component has been repaired or replaced; has been re-inspected using EPA Method 21; and is found to be in compliance with the requirements of Rule 4455. [District Rule 4455, 5.3.1 5.3.2 and 5.3.3] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

90. An operator shall minimize all component leaks immediately to the extent possible, but not later than one (1) hour after detection of leaks in order to stop or reduce leakage to the atmosphere. [District Rule 4455, 5.3.4] Federally Enforceable Through Title V Permit

91. If the leak has been minimized but the leak still exceeds the applicable leak standards of Rule 4455, an operator shall repair or replace the leaking component, vent the leaking component to a closed vent system, or remove the leaking component from operation as soon as practicable but not later than the time period specified in Table 3. For each calendar quarter, the operator may be allowed to extend the repair period as specified in Table 3, for a total number of leaking components, not to exceed 0.05 percent of the number of components inspected, by type, rounded upward to the nearest integer where required. [District Rule 4455, 5.3.5] Federally Enforceable Through Title V Permit

92. If the leaking component is an essential component or a critical component and which cannot be immediately shut down for repairs, the operator shall minimize the leak within one hour after detection of the leak. If the leak has been minimized, but the leak still exceeds any of the applicable leak standards of Rule 4455, the essential component or critical component shall be repaired or replaced to eliminate the leak during the next process unit turnaround, but in no case later than one year from the date of the original leak detection, whichever comes earlier. [District Rule 4455 5.3.6] Federally Enforceable Through Title V Permit

93. For any component that has incurred five repair actions for major gas leaks or major liquid leaks, or any combination of major gas leaks and major liquid leaks within a continuous 12-month period, the operator shall comply with at least one of the requirements specified in Sections 5.3.7.1, 5.3.7.2, 5.3.7.3, or 5.3.7.4 by the applicable deadlines specified in Sections 5.3.7.5 and 5.3.7.6. If the original leaking component is replaced with a new like-in-kind component before incurring five repair actions for major leaks within 12-consecutive months, the repair count shall start over for the new component. An entire compressor or pump need not be replaced provided the compressor part(s) or pump part(s) that have incurred five repair actions as described in Section 5.3.7 are brought into compliance with at least one of the requirements of Sections 5.3.7.1 through 5.3.7.6. [District Rule4455, 5.3.7] Federally Enforceable Through Title V Permit

94. The operator shall monitor process PRD by using electronic process control instrumentation that allows for real time continuous parameter monitoring or by using telltale indicators for the process PRD where parameter monitoring is not feasible. This requirement applies only to any process PRD that is vented to atmosphere. [District Rule 4455, 5.4.1] Federally Enforceable Through Title V Permit

95. All major components and critical components shall be physically identified clearly and visibly for inspection, repair, and recordkeeping purposes. The physical identification shall consist of labels, tags, manufacturer's nameplate identifier, serial number, or model number, or other system approved by the APCO that enables an operator or District personnel to locate each individual component. The operator shall replace tags or labels that become missing or unreadable as soon as practicable but not later than 24 hours after discovery. The operator shall comply with the requirements of Sections 6.1.4 if there is any change in the description of major components or critical components. [District Rule 4455, 5.5.1 & 5.5.2] Federally Enforceable Through Title V Permit

96. The operator shall keep a copy of the operator management plan at the facility and make it available to the APCO, ARB and US EPA upon request. By January 30 of each year, the operator shall submit to the APCO for approval, in writing, an annual report indicating any changes to the existing, approved operator management plan. [District Rule 4455, 6.1.2 & 6.1.4] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

97. The operator shall maintain an inspection log containing, at a minimum, 1) total number of components inspected, and total number and percentage of leaking components found by component types, 2) location, type, name or description of each leaking component, and description of any unit where the leaking component is found, 3) date of leak detection and method of leak detection, 4) for gaseous leaks, record the leak concentration in ppmv, and for liquid leaks record whether the leak is a major liquid leak or a minor liquid leak, 5) date of repair, replacement, or removal from operation of leaking components, 6) identification and location of essential component and critical components found leaking that cannot be repaired until the next process unit turnaround or not later one year after leak detection, whichever comes earlier, 7) methods used to minimize the leak from essential components and critical components that cannot be repaired until the next process unit turnaround or not later one year after leak detection, whichever comes earlier, 8) after the component is repaired or is replaced, the date of reinspection and the leak concentration in ppmv, 9) inspector's name, business mailing address, and business telephone number, and 10) the facility operator responsible for the inspection and repair program shall sign and date the inspection log certifying the accuracy of the information recorded in the log. [District Rule 4455, 6.2.1] Federally Enforceable Through Title V Permit

98. Records of each calibration of the portable hydrocarbon detection instrument utilized for inspecting components, including a copy of current calibration gas certification from the vendor of said calibration gas cylinder, the date of calibration, concentration of calibration gas, analyzer reading of calibration gas before adjustment, instrument reading of calibration gas after adjustment, calibration gas expiration date, and calibration gas cylinder pressure at the time of calibration. [District Rule 4455, 6.2.3] Federally Enforceable Through Title V Permit

99. The operator shall notify the APCO, by telephone or other methods approved by the APCO, of any process PRD release described in Sections 5.4.4 and 5.4.5, and any release in excess of the reportable quantity limits as stipulated in 40 CFR, Part 117, Part 302 and Part 355, including any release in excess of 100 pounds of VOC, within one hour of such occurrence or within one hour of the time said person knew or reasonably should have known of its occurrence. This requirement applies only to any process PRD that is vented to atmosphere. [District Rule 4455, 6.3.1] Federally Enforceable Through Title V Permit

100. The operator shall submit a written report to the APCO within thirty (30) calendar days following a PRD release subject to 6.3.1. The written report shall include 1) process PRD type, size, and location, 2) date, time and duration of the process PRD release, 3) types of VOC released and individual amounts, in pounds, including supporting calculations, 4) cause of the process PRD release, and 5) corrective actions taken to prevent a subsequent process PRD release. This requirement applies only to any process PRD that is vented to atmosphere. [District Rule4455 6.3.2] Federally Enforceable Through Title V Permit

101. Copies of all records shall be retained for a minimum of five (5) years after the date of an entry. Such records shall be made available to the APCO, ARB, or US EPA upon request. [District Rule 4455, 6.2.2, 6.2.3 & 6.2.4] Federally Enforceable Through Title V Permit

102. Measurements of gaseous leak concentrations shall be conducted according to US EPA Method 21 using an appropriate portable hydrocarbon detection instrument calibrated with methane. The instrument shall be calibrated in accordance with the procedures specified in US EPA Method 21 or the manufacturer's instruction, as appropriate, not more than 30 days prior to its use. The operator shall record the calibration date of the instrument. [District Rule 4455, 6.4.1] Federally Enforceable Through Title V Permit

103. The VOC content shall be determined using American Society of Testing and Materials (ASTM) D 1945 for gases and South Coast Air Quality Management District (SCAQMD) Method 304-91 for liquids. [District Rule 4455, 6.4.2] Federally Enforceable Through Title V Permit

104. The percent by volume liquid evaporated at 150 C shall be determined using ASTM D 86. [District Rule 4455, 6.4.3] Federally Enforceable Through Title V Permit

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

PERMIT NO: S-33-415-0 **ISSUANCE DATE:** DRAFT

LEGAL OWNER OR OPERATOR: BIG WEST OF CA, LLC
MAILING ADDRESS: 6451 ROSEDALE HWY (AREA 1 & 2)
BAKERSFIELD, CA 93308

LOCATION: 6451 ROSEDALE HWY (AREA 1 & 2)
BAKERSFIELD, CA 93308

EQUIPMENT DESCRIPTION:
FORCED DRAFT COOLING TOWER WITH A CIRCULATION RATE OF UPTO 15,000 GPM AND HIGH EFFICIENCY DRIFT ELIMINATOR, SERVING FCCU, VGO-HDS UNIT, MEROX UNIT, HGU2 AND OTHER ASSOCIATED PROCESS EQUIPMENT

CONDITIONS

1. {1829} The facility shall submit an application to modify the Title V permit in accordance with the timeframes and procedures of District Rule 2520. [District Rule 2520] Federally Enforceable Through Title V Permit
2. {1830} This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District NSR Rule] Federally Enforceable Through Title V Permit
3. At least 30 days prior to initiation of construction of this unit, permittee shall submit to the District final design details, vendor guaranteed maximum total liquid drift, maximum design pumping capacity of each of the water pumps serving this unit, total electric motor horsepower (pumps, fans, blowers, etc.), and the details of the design, placement and operation of the VOC monitoring equipment selected. [District Rule 2201]
4. No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
5. Particulate matter emissions shall not exceed 0.1 grain/dscf of gas at operating conditions. [District Rule 4201,3.1] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (661) 326-6900 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director / APCO

DRAFT

DAVID WARNER, Director of Permit Services

6. Permittee shall install, operate and maintain a monitoring system to identify the presence of hydrocarbon leaks into the cooling water. This monitoring system shall consist of either a LEL/VOC monitor, a monitor of oxidation reduction potential of the cooling water, or other monitoring as approved by the District. For any continuous reading over 10% LEL or over 100 ppm VOC as methane, or any continuous reading of the oxidation reduction potential (ORP) less than 200 mV, the permittee shall immediately inspect the upstream heat exchanger/water coolers for leaks. All leaks shall be repaired within 15 days of detection. If the leaking component is an essential component or critical component and cannot be immediately shut down for repairs, the operator shall minimize the leak within one hour after detection of the leak. If the leak has been minimized, but the LEL or ORP readings still indicate a leak into the cooling tower, the essential component or critical component shall be repaired or replaced at the next process unit turnaround, or within one year of the original leak detection, whichever comes earlier. [District Rule 2201] Federally Enforceable Through Title V Permit

7. No hexavalent chromium containing compounds shall be added to cooling tower circulating water. [District Rules 4201and 7012] Federally Enforceable Through Title V Permit

8. Permittee shall maintain monthly records of TDS (mg/liter) in the circulating water. All record shall be retained for a minimum period of 5 years and shall be made available for District inspection upon request. [District Rule 2201] Federally Enforceable Through Title V Permit

9. Permittee shall maintain a record of the operation of the hydrocarbon leak detection system, including all continuous LEL/VOC monitor readings and all continuous ORP readings, the date and description of all inspections undertaken, all components identified as leaking and their respective leak rates, and the date and description of all leak minimization, repair or replacement actions taken. All records shall retained for a minimum period of 5 years and be made available for District inspection upon request. [District Rule 2201] Federally Enforceable Through Title V Permit

10. Drift eliminator drift rate shall not exceed 0.0005% of the circulated water. [District Rule 2201] Federally Enforceable Through Title V Permit

11. PM10 emission rate shall not exceed 1.8 lb/day. [District Rule 2201] Federally Enforceable Through Title V Permit

12. VOC emission rate shall not exceed 15.1 lb/day. [District Rule 2201] Federally Enforceable Through Title V Permit

13. Compliance with the PM10 daily emission limit shall be demonstrated as follows: PM10 lb/day = circulating water recirculation rate x total dissolved solids concentration in the circulating water x manufacturer's design drift rate. [District Rule 2201] Federally Enforceable Through Title V Permit

14. Prior to operating equipment under this Authority to Construct, permittee shall surrender emission reduction credits to offset the calendar quarter emissions increases set forth below, at the distance offset ratio specified in Rule 2201 (4/20/05 version) Table 4.2 and the interpollutant offset ratio specified in this permit, PM10 - Q1: 164 lb, Q2: 164 lb, Q3: 164 lb and Q4: 164 lb and VOC - Q1: 1,378 lb, Q2: 1,378 lb, Q3: 1,378 lb and Q4: 1,378 lb. [District Rule 2201] Federally Enforceable Through Title V Permit

15. ERC Certificate Number S-2183-2 (or certificates split from this certificate) shall be used to supply the required PM10 offsets and ERC Certificate Number S-2452-1 (or a certificate split from this certificate) shall be used to supply the required VOC offsets, unless a revised offsetting proposal is received and approved by the District, upon which this Authority to Construct shall be reissued, administratively specifying the new offsetting proposal. Original public noticing requirements, if any, shall be duplicated prior to reissuance of this Authority to Construct. [District Rule 2201] Federally Enforceable Through Title V Permit

16. NOx ERCs may be used to offset PM10 emission increases at a ratio of 2.16 lb NOx : 1 lb PM10. [District Rule 2201] Federally Enforceable Through Title V Permit

DRAFT

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

PERMIT NO: S-33-416-0 **ISSUANCE DATE:** DRAFT

DRAFT

LEGAL OWNER OR OPERATOR: BIG WEST OF CA, LLC
MAILING ADDRESS: 6451 ROSEDALE HWY (AREA 1 & 2)
BAKERSFIELD, CA 93308

LOCATION: 6451 ROSEDALE HWY (AREA 1 & 2)
BAKERSFIELD, CA 93308

EQUIPMENT DESCRIPTION:
FORCED DRAFT COOLING TOWER WITH A CIRCULATION RATE OF UPTO 15,000 GPM AND HIGH EFFICIENCY DRIFT ELIMINATOR, SERVING THE ALKYLATION UNIT

CONDITIONS

1. {1829} The facility shall submit an application to modify the Title V permit in accordance with the timeframes and procedures of District Rule 2520. [District Rule 2520] Federally Enforceable Through Title V Permit
2. {1830} This Authority to Construct serves as a written certificate of conformity with the procedural requirements of 40 CFR 70.7 and 70.8 and with the compliance requirements of 40 CFR 70.6(c). [District NSR Rule] Federally Enforceable Through Title V Permit
3. At least 30 days prior to initiation of construction of this unit, permittee shall submit to the District final design details, vendor guaranteed maximum total liquid drift, maximum design pumping capacity of each of the water pumps serving this unit, total electric motor horsepower (pumps, fans, blowers, etc.), and the details of the design, placement and operation of the VOC monitoring equipment selected. [District Rule 2201]
4. No air contaminant shall be released into the atmosphere which causes a public nuisance. [District Rule 4102]
5. Particulate matter emissions shall not exceed 0.1 grain/dscf of gas at operating conditions. [District Rule 4201,3.1] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

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Seyed Sadredin, Executive Director / APCO

DRAFT

DAVID WARNER, Director of Permit Services

S-33-416-0 : Sep 3 2008 9:25AM – KARRSR : Joint Inspection Required with KARRSR

6. Permittee shall install, operate and maintain a monitoring system to identify the presence of hydrocarbon leaks into the cooling water. This monitoring system shall consist of either a LEL/VOC monitor, a monitor of oxidation reduction potential of the cooling water, or other monitoring as approved by the District. For any continuous reading over 10% LEL or over 100 ppm VOC as methane, or any continuous reading of the oxidation reduction potential (ORP) less than 200 mV, the permittee shall immediately inspect the upstream heat exchanger/water coolers for leaks. All leaks shall be repaired within 15 days of detection. If the leaking component is an essential component or critical component and cannot be immediately shut down for repairs, the operator shall minimize the leak within one hour after detection of the leak. If the leak has been minimized, but the LEL or ORP readings still indicate a leak into the cooling tower, the essential component or critical component shall be repaired or replaced at the next process unit turnaround, or within one year of the original leak detection, whichever comes earlier. [District Rule 2201] Federally Enforceable Through Title V Permit
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