

## ENGINEERING EVALUATION

Phillips 66 – San Francisco Refinery, Plant: 21359  
1380 San Pablo Avenue, Rodeo, CA 94572  
Application 31157

### 1.0 - Background

Phillips 66 San Francisco Refinery (Phillips 66), located in Rodeo, has proposed the Rodeo Renewed Project to modify the existing Rodeo Refinery into a repurposed facility that would process renewable feedstocks into renewable diesel, renewable gasoline, renewable naphtha, and renewable jet fuel. The Rodeo Renewed Project as a whole was approved by the Contra Costa Board of Supervisors on May 3, 2022. However, the proposed changes also require permits from the Bay Area Air Quality Management District (Air District). Accordingly, through Application 31157 (the “project”), Phillips 66 has applied to the Air District for Authorities to Construct, Permits to Operate, and Certificates of Exemption for the sources shown in the table below. This Engineering Evaluation describes the changes proposed by the project; discusses the applicable air quality regulations and how the Project will apply with them; and includes permit conditions that will be imposed to ensure compliance.

As shown in the table below, many of the sources included in the project will either be alterations (meaning the project will not increase their potential to emit criteria pollutants<sup>1</sup>) or will be exempt from Air District regulations as a result of the project. The project also includes two modified sources plus numerous new sources, and numerous sources will be shut down. Modified and new sources are subject to New Source Review permitting requirements under Regulation 2-2, including offsetting new emissions and applying Best Available Control Technology (BACT) or Reasonably Available Control Technology (RACT) where applicable. Compliance with offsetting requirements and BACT/RACT requirements are discussed in sections 3.0 and 5.0, respectively. Of note, section 3.0 shows that emission reductions from equipment to be shut down will exceed emission increases due to the project for all criteria pollutants except POCs. Phillips 66 will provide banking certificates to offset the excess POC emissions. Regarding Toxic Air Contaminants (TACs), a Health Risk Assessment (HRA) was prepared for the project, and as discussed in section 4.0, demonstrates that health risks comply with risk limitations set by Regulation 2-5-302. The project’s cancer risk is 0.065 in one million, its chronic hazard index is 0.13, and its acute hazard index is 0.21. The Air District has made a preliminary determination that the project will comply with all applicable regulatory requirements, and the Air District’s preliminary recommendation is to issue the requested authorities to construct. However, the Air District will consider all timely submitted comments prior to making its final determination on the permit application.

### Existing Sources

Source/ Abatement Device No.	Source/Abatement Device Description/capacity	Pre-project Status	Permit Exemption (if applicable)	Post-Project Status
S-11	U240_B-201 Heater, 108 MMBtu/hr	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-12	U240 B-202 Heater, 42 MMBtu/hr	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-13	U240_B-301 Heater, 194 MMBtu/hr, abated by A-113 U240 B-301 Heater SCR Unit	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-22	U248_B-606 HEATER, 31 MMBtu/hr	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-45	Heavy Gas Oil Feed Heater U246, B-801 A/B Heater, 85 MMBtu/hr, abated by A-47 Selective Catalytic Reduction Unit for U240 HGO Feed Heater	Permitted, NSR	NA	Permitted, Alteration: no increased PTE

<sup>1</sup> Air quality regulations divide air pollutants into two groups: criteria pollutants and toxic air contaminants (TACs). Criteria air pollutants are pollutants for which health-based ambient air quality standards have been established. The principal criteria pollutants addressed by Air District regulations are ozone (which is addressed by controlling emissions of the precursor pollutants that combine to form ozone, Precursor Organic Compounds (POC) and nitrogen oxides (NOx)); fine particulate matter smaller than 10 microns in diameter (PM<sub>10</sub>); fine particulate matter smaller than 2.5 microns in diameter (PM<sub>2.5</sub>); carbon monoxide (CO); and sulfur dioxide (SO<sub>2</sub>). TACs are a subset of air pollutants for which ambient air quality standards have not been established, but which can be harmful to health and the environment even in very small amounts. The TACs addressed by Air District regulations are listed in Table 2-5-1 of District Regulation 2, Rule 5.

Source/ Abatement Device No.	Source/Abatement Device Description/capacity	Pre-project Status	Permit Exemption (if applicable)	Post-Project Status
S-70	Rail Renewable Feedstock Unloading Rack (formerly Butane Loading Rack), abated by A-7 Vapor Recovery System	Exempt	Regulation 2-1-123.3.2 (IBP <sup>1</sup> > 302 °F) Regulation 2-1-123.3.6 (tallow, vegetable oil)	Exempt
S-90	TANK NO. 67, 2100 thousand gallons	Exempt	Regulation 2-1-123.3.2 Regulation 2-1-123.3.6	Exempt
S-97	TANK NO. 100, 12474 thousand gallons, abated by A-626 Activated Carbon Vessel	Permitted, NSR	Regulation 2-1-123.3.2 Regulation 2-1-123.3.6	Exempt (issuance of Certificate of Exemption upon startup of Rodeo Renewed Project)  Change external floating to cone roof; add 1 carbon vessel
S-99	TANK NO. 102, 7140 thousand gallons	Exempt	Regulation 2-1-123.3.2 (no change)	Exempt
S-101	Tank 104 Storm Water Equalization, 5500 thousand gallons	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-102	Tank 105 Storm Water Equalization, 5500 thousand gallons	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-103	TANK NO. 106, 3276 thousand gallons	Exempt	Regulation 2-1-123.3.2 (no change)	Exempt
S-105	TANK NO. 129, 3066 thousand gallons	Exempt	Regulation 2-1-123.3.2 (no change)	Exempt
S-106	Tank 130 Stormwater Equalization, 10600 thousand gallons	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-108	TANK NO. 153, 5586 thousand gallons	Exempt	Regulation 2-1-123.3.2 Regulation 2-1-123.3.6	Exempt
S-110	TANK NO. 155, 47,000 bbls	Permitted, Grandfathered	Regulation 2-1-123.3.2 Regulation 2-1-123.3.6	Exempt (issuance of Certificate of Exemption upon startup of Rodeo Renewed Project)
S-111	TANK NO. 156, 100,000 bbls	Permitted, Grandfathered	Regulation 2-1-123.3.2 Regulation 2-1-123.3.6	Exempt (issuance of Certificate of Exemption upon completion of tank cleaning)

Source/ Abatement Device No.	Source/Abatement Device Description/capacity	Pre-project Status	Permit Exemption (if applicable)	Post-Project Status
S-112	TANK NO. 157, 100,000 bbls	Permitted, Grandfathered	Regulation 2- 1-123.3.2 Regulation 2- 1-123.3.6	Exempt (issuance of Certificate of Exemption upon completion of tank cleaning)
S-113	TANK NO. 158, 101,000 bbls	Permitted, Grandfathered	Regulation 2- 1-123.3.2 Regulation 2- 1-123.3.6	Exempt (issuance of Certificate of Exemption upon completion of tank cleaning)
S-114	TANK NO. 159, 136,000 bbls	Permitted, Grandfathered	Regulation 2- 1-123.3.2 Regulation 2- 1-123.3.6	Exempt (issuance of Certificate of Exemption upon startup of Rodeo Renewed Project)
S-122	TANK 167, 3.1 MM gallons	Permitted, NSR	NA	Permitted, Alteration
S-125	Tank 170, 3024 thousand gallons	Permitted, Grandfathered	NA	Permitted, Alteration
S-126	Tank No. 172, 75,000 bbls	Permitted, NSR	NA	Permitted, Alteration
S-127	TANK NO. 173, 3024 thousand gallons	Exempt	Regulation 2- 1-123.3.2 (no change)	Exempt
S-135	Tank #200, 79,000 bbls, abated by A-7 Vapor Recovery System	Permitted, NSR	Regulation 2- 1-123.3.2 Regulation 2- 1-123.3.6	Exempt (issuance of Certificate of Exemption upon completion of tank cleaning)  [odor abatement control]
S-137	TANK NO. 202, 88,000 bbls, abated by A-7 Vapor Recovery System	Permitted, NSR	Regulation 2- 1-123.3.2 Regulation 2- 1-123.3.6	Exempt (issuance of Certificate of Exemption upon completion of tank cleaning)  [odor abatement control]
S-139	TANK NO. 204, 81,000 bbls, abated by A-7 Vapor Recovery System	Permitted, NSR	NA	Permitted, Alteration: no increased PTE [odor abatement control]
S-140	TANK #205, 54,000 bbls, abated by A-7 Vapor Recovery System	Permitted, NSR	NA	Permitted, Alteration: no increased PTE [odor abatement control]

Source/ Abatement Device No.	Source/Abatement Device Description/capacity	Pre-project Status	Permit Exemption (if applicable)	Post-Project Status
S-150	TANK NO. 241, 79,000 bbls	Permitted, NSR	NA	Permitted, Alteration
S-173	TANK #280, 134,000 bbls, abated by A-7, Vapor Recovery System,	Permitted, Grandfathered	Regulation 2-1-123.3.2 Regulation 2-1-123.3.6	Exempt (issuance of Certificate of Exemption upon completion of tank cleaning) [odor abatement control]
S-174	TANK #281, 134,000 bbls, abated by A-7, Vapor Recovery System	Permitted, Grandfathered	Regulation 2-1-123.3.2 Regulation 2-1-123.3.6	Exempt [odor abatement control] (issuance of Certificate of Exemption upon startup of Rodeo Renewed Project)
S-175	TANK #284, 134,000 bbls, abated by A-7, Vapor Recovery System	Permitted, Grandfathered	Regulation 2-1-123.3.2 Regulation 2-1-123.3.6	Exempt [odor abatement control] (issuance of Certificate of Exemption upon startup of Rodeo Renewed Project)
S-188	TANK NO. 300, 378 thousand gallons, abated by A-7 Vapor Recovery System	Exempt	Regulation 2-1-123.3.1 (No Change)	EXEMPT (sphere)
S-189	TANK NO. 301, 189 thousand gallons, abated by A-7 Vapor Recovery System	Exempt	Regulation 2-1-123.3.1 (No Change)	EXEMPT (sphere)
S-190	TANK NO. 302, 756 thousand gallons, abated by A-7 Vapor Recovery System	Exempt	Regulation 2-1-123.3.1 (No Change)	EXEMPT (sphere)
S-195	Tank 501, Sludge (API sediment, DAF float & sediment), 2,500 bbls	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-204	TANK NO. 528, 1806 thousand gallons	Exempt	Regulation 2-1-123.3.2 Regulation 2-1-123.3.6	EXEMPT
S-205	TANK NO. 529, 1806 thousand gallons	Exempt	Regulation 2.1.123.3.2 Regulation 2-1-123.3.2 Regulation 2-1-123.3.6	Exempt
S-253	TANK NO. 833, 189 thousand gallons, abated by A-7 Vapor Recovery System	Exempt	Regulation 2-1-123.3.1 (No Change)	Exempt (sphere)
S-254	TANK NO. 1001, 104,000 bbls	Permitted, Grandfathered	NA	Permitted, Alteration with established

Source/ Abatement Device No.	Source/Abatement Device Description/capacity	Pre-project Status	Permit Exemption (if applicable)	Post-Project Status
				condition limits: no increased PTE
S-256	Tank No. 1003 , 104,000 bbls	Permitted, Grandfathered	NA	Permitted, Alteration with established condition limits: no increased PTE
S-257	Tank No. 1004 , 104,000 bbls	Permitted, Grandfathered	NA	Permitted, Alteration with established condition limits: no increased PTE
S-261	TANK NO. 1010, 104,000 bbls	Permitted, NSR	Regulation 2- 1-123.3.2	Exempt (issuance of Certificate of Exemption upon startup of Rodeo Renewed Project)
S-262	TANK NO. 1011, 4368 thousand gallons	Exempt	Regulation 2- 1-123.3.2 (no change)	Exempt
S-263	Tank 1012, , 4200 thousand gallons	Exempt	Regulation 2- 1-123.3.2	Exempt
S-296	C-1 FLARE, 6.6 MMBtu/hr pilot	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-307	U240 UNICRACKING UNIT 240	Permitted, NSR	NA	Modification; Replace two existing reactor vessels at end of life. Replace and modify existing heat exchangers. Add new process surge vessel, charge pump, minor chemical storage tanks and feed filters. Retray four existing distillation towers.
S-309	U248_UNISAR UNIT 248	Permitted, NSR	NA	Permitted, Alteration (convert to isomerization unit): no increased PTE
S-318	Unit 76	Permitted, NSR	NA	Permitted, Alteration
S-322	U40_RAW MATERIALS RECEIVING	Permitted, NSR	NA	Permitted, Alteration
S-324	324 U100_API OIL WASTEWATER SEPARATOR (with outlet channel cover), abated by A-53 Thermal Oxidizer for S-324	Permitted, NSR	NA	Permitted, Alteration: no increased PTE

Source/ Abatement Device No.	Source/Abatement Device Description/capacity	Pre-project Status	Permit Exemption (if applicable)	Post-Project Status
S-334	Tank #107, 180,000 bbls	Permitted, NSR	Regulation 2-1-123.3.2 Regulation 2-1-123.3.6	Exempt (issuance of Certificate of Exemption upon startup of Rodeo Renewed Project)
S-338	U233 FUEL GAS CENTER, 7.5E6 cubic feet/hr	Permitted, Grandfathered	NA	Permitted, Alteration with established condition limits: no increased PTE
S-339	U80_REFINED OIL SHIPPING UNIT	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-340	TANK #108, 200,000 bbls	Permitted, NSR	Regulation 2-1-123.3.2 Regulation 2-1-123.3.6	Exempt (issuance of Certificate of Exemption upon completion of tank cleaning)
S-341	TANK #208, 103,000 bbls	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-342	TANK #209, 103,000 bbls	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-352	Combustion Turbine (16.6 MW), 291 MMBtu/hr, abated by S-355 Supplemental Firing Duct Burners	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-353	Combustion Turbine (16.6 MW), 291 MMBtu/hr, abated by S-356 Supplemental Firing Duct Burners	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-354	Combustion Turbine (16.6 MW), 291 MMBtu/hr, abated by S-357 Supplemental Firing Duct Burners	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-355	Supplemental Firing Duct Burners, 175 MMBtu/hr, abated by A-13 SCR/CO Converter Unit	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-356	Supplemental Firing Duct Burners, 175 MMBtu/hr, abated by A-14 SCR/CO Converter Unit	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-357	Supplemental Firing Duct Burners, 175 MMBtu/hr, abated by A-15 SCR/CO Converter Unit	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-360	Mid-Barrel Tank 223, 110,000 bbls, abated by A-7 Vapor Recovery System	Permitted, NSR	Regulation 2-1-123.3.2 Regulation 2-1-123.3.6	Exempt (issuance of Certificate of Exemption upon startup of Rodeo Renewed Project)
S-381	Aeration Tank, Pact (F-201), 1.2 MM gallons	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-382	Aeration Tank, Pact (F-202), 1.2 MM gallons	Permitted, NSR	NA	Permitted, Alteration: no increased PTE

Source/ Abatement Device No.	Source/Abatement Device Description/capacity	Pre-project Status	Permit Exemption (if applicable)	Post-Project Status
S-383	Clarifier, F-203, 0.69 MM gallons	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-384	Clarifier (F-204), 0.69 MM gallons	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-385	Media Filter (F-271 to F-278), 420,000 gallons/hr	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-386	PAC Regeneration Sludge Thickener (F-211), 44,000 gallons	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-387	Wet Air Regeneration (P-202), 15 gpm	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-390	F-248 Thickened Sludge Storage, 26.5 thousand gallons	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-398	MP-30 Flare, 3.1 MMBtu/hr pilot	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-400	Wet Weather Wastewater Sump, abated by A- 40 Wet Weather Sump Vented Cover	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-401	Dry Weather Wastewater Sump, abated by A-41 Dry Weather Sump Vented Cover	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-425	Marine Terminal Berth M1, 2 permitted arms, abated by A-420 Thermal Oxidizer	Permitted, NSR	NA	Permitted, Alteration
S-426	Marine Terminal Berth M2, 4 permitted arms, abated by A-420 Thermal Oxidizer	Permitted, NSR	NA	Permitted, Alteration
S-434	U246 High Pressure Reactor Train	Permitted, NSR	NA	Modification. Replace and modify existing heat exchangers. Add new chemical storage tanks and feed filters. Retray two existing distillation towers
S-437	Hydrogen Manufacturing Unit, abated by S-438 U110_H-1 Furnace (H2 Plant Reforming)	Permitted, NSR	NA	Permitted, Alteration
S-438	U110_H-1 Furnace (H2 Plant Reforming), 250 MMBtu/hr, abated by A-46 Selective Catalytic Reduction Unit	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-445	Tank 271 , 189,000 bbls, abated A-7 Vapor Recovery System	Permitted, NSR	Regulation 2- 1-123.3.2 Regulation 2- 1-123.3.6	Exempt (issuance of Certificate of Exemption upon completion of tank cleaning)
S-446	Tank 310 (ISOPENTANE), 1722 thousand gallons, abated by A-7 Vapor Recovery System	Permitted, NSR	NA	Administrative Change of Conditions <sup>2</sup>

Source/ Abatement Device No.	Source/Abatement Device Description/capacity	Pre-project Status	Permit Exemption (if applicable)	Post-Project Status
S-447	Tank 311 (Isopentane), 1722 thousand gallons, abated by A-7 Vapor Recovery System	Permitted, NSR	NA	Administrative Change of Conditions <sup>2</sup>
S-448	Tank 1007 (Blendstock Receiving), 243,000 bbls	Permitted, NSR	Regulation 2-1-123.3.2	Exempt (issuance of Certificate of Exemption upon startup of Rodeo Renewed Project)
S-449	TANK #285, 189,000 bbls, abated by A-7, Vapor Recovery System	Permitted, NSR	Regulation 2-1-123.3.2 Regulation 2-1-123.3.6	Exempt (issuance of Certificate of Exemption upon startup of Rodeo Renewed Project)
S-453	U236 Cooling Tower, 13,500 gpm	Permitted, Grandfathered	NA	Permitted, Alteration with established condition limits: no increased PTE
S-455	U240 Cooling Tower, 33,000 gpm	Permitted, Grandfathered	NA	Permitted, Alteration with established condition limits: no increased PTE
S-456	U110 Cooling Tower, 750 gpm	Exempt	Regulation 2-1-128.4 (No Change)	Exempt
S-465	Unit 235 Sulfur Pit-Tank, 200 long ton/day, abated by S-1010 U235 Sulfur Recovery Unit	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-500	ULSD Cooling Tower, 7639 gpm	Exempt	Regulation 2-1-128.4 (No Change)	Exempt
S-503	Sulfur Storage Tank, 471 long ton/day, abated by S-1010 Sulfur Plant Unit 235	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-504	Sulfur Degassing Unit, 400 long ton/day, abated by S-1010 Sulfur Plant Unit 235	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-505	Sulfur Truck Loading Rack, 200 gpm sulfur, abated by S-1010 Sulfur Plant Unit 235	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-506	Fixed Roof Tank 257, 80,000 bbls, abated by A-7, Vapor Recovery System,	Permitted, NSR	Regulation 2-1-123.3.2 Regulation 2-1-123.3.6	Exempt (issuance of Certificate of Exemption upon startup of Rodeo Renewed Project)
S-1007	U100-Dissolved Air Flotation Unit (with fixed roof), abated by: A-49 Thermal Oxidizer A-51 DAF Carbon Bed A-53 Thermal Oxidizer for S-324	Permitted, NSR	NA	Permitted, Alteration: no increased PTE



Source/ Abatement Device No.	Source/Abatement Device Description/capacity	Pre-project Status	Permit Exemption (if applicable)	Post-Project Status
S-1008	U100_Primary Stormwater Basin	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-1009	U100_Main Stormwater Basin	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-1010	U235 Sulfur Recovery Unit, 200 long ton/day, abated by A-48 Sulfur Plant Tail Gas Treatment Plant	Permitted, NSR	NA	Permitted, Alteration: no increased PTE
S-32120	Tank 224, 110,000 bbls	Exempt	Regulation 2- 1-123.3.2 Regulation 2- 1-123.3.6	Exempt

#### New Sources

Source/ Abatement No.	Source/Abatement Description	Requested Permit Action	Permit Exemption (if applicable)	Status of Source
S-599	<p>S-599 Sour Water Strippers and Amine Gas Treatment System, abated by Unit 237 Sulfur Treatment Unit (2 Trains), consisting of:</p> <p>Train #1: A-598 Thermal Oxidizer (B-201 Main Burner, B-202 Reduction Furnace, B-203 Oxidation Furnace, B-204 Auxiliary Burner, and E-205 Waste Heat Boiler, 7.4 MMBtu/hr) and A-599 SO2 Scrubber (D-211 Venturi, D-212 Caustic Scrubber, D-213 Cold Stack)</p> <p>Train #2: A-600 Thermal Oxidizer (B-201 Main Burner, B-202 Reduction Furnace, B-203 Oxidation Furnace, B-204 Auxiliary Burner, and E-205 Waste Heat Boiler, 7.4 MMBtu/hr) and A-601 SO2 Scrubber (D-211 Venturi, D-212 Caustic Scrubber, D-213 Cold Stack)</p>	Authority to Construct/ Permit to Operate	NA	New Source
S-600	Pretreatment Unit (PTU), consisting of 3 trains, 80,000 bbls/day, abated by A-622 and A-624 Biofilters and A-623 and A-625 Carbon Adsorption Systems	Authority to Construct/ Permit to Operate	NA	New Source
S-601	Bleaching Earth Storage Silos (12), each abated by A-627 through A-638 Pulse Jet Dust Houses (12), 1,600 dscfm maximum each	Certificate of Exemption	Regulation 2-1-115.1.4.4 (Operating, loading and unloading the following	New Source Exempt

Source/ Abatement No.	Source/Abatement Description	Requested Permit Action	Permit Exemption (if applicable)	Status of Source
			sources which process exclusively material with a moisture content greater than or equal to 5 percent by weight for storage silos)	
S-602	Filter Aid Storage Silos (9) and Truck Loading/Traffic, each abated by A-606 through A-614 Pulse Jet Dust Houses (9), 1,600 dscfm maximum each	Authority to Construct/ Permit to Operate	NA	New Source
S-603	Polyethylene Removal Filter Aid Day Hoppers (4), abated by A-615 and A-618 Dust Filters (4), 665 dscfm maximum each	Authority to Construct/ Permit to Operate	NA	New Source
S-604	Bleaching Earth Adsorption Day Hoppers (6), 665 dscfm maximum each, abated by A-639 through A-644 Dust Filters (6), 665 dscfm maximum each	Certificate of Exemption	Regulation 2-1-115.1.4.5 (Operating, loading and unloading the following sources which process exclusively material with a moisture content greater than or equal to 5 percent by weight for storage or weigh hopper/bin system)	New Source Exempt
S-605	Filter Aid Adsorption Day Hoppers (3), abated by A-619 and A-621 Dust Filters (3), 665 dscfm maximum each	Authority to Construct/ Permit to Operate	NA	New Source
S-606	Spent Water Tank (at S-600 Pretreatment Unit), 98,100 gallons, abated by abated by A-598, Biofilter and A-599 Carbon Adsorption System	Authority to Construct/ Permit to Operate	NA	New Source
S-607	Sulfuric Acid Tank (at S-600 Pretreatment Unit), 400 gallons	Certificate of Exemption	Regulation 2-1-123.2.1 (Sulfuric acid with an acid strength of less than or equal to 99.0% by weight)	New Source Exempt

Source/ Abatement No.	Source/Abatement Description	Requested Permit Action	Permit Exemption (if applicable)	Status of Source
S-608	Citric Acid Tank (at S-600 Pretreatment Unit), 16,100 gallons	Certificate of Exemption	Regulation 2-1- 123.2 (Tanks, vessels and pumping equipment used exclusively for the storage or dispensing of any aqueous solution which contains less than 1 percent (wt) organic compounds)	New Source Exempt
S-609	Sodium Hydroxide Tank (at S-600 Pretreatment Unit), 5160 gallons	Certificate of Exemption	Regulation 2-1- 123.2	New Source Exempt
S-610	Coagulant Tank (at S-600 Pretreatment Unit), 400 gallons	Certificate of Exemption	Regulation 2-1- 123.2	New Source Exempt
S-611	Polymer Tank (at S-600 Pretreatment Unit), 400 gallons	Certificate of Exemption	Regulation 2-1- 123.2	New Source Exempt
S-612	DAFs (2), 17,000 gallons each (at S-600 Pretreatment Unit), abated by A-622 and A-624 Biofilters and A-623 and A-625 Carbon Adsorption Systems	Authority to Construct/ Permit to Operate	NA	New Source
S-613	Process Tanks (3), 4,700 gallons, 128,388 gallons and 528 gallons (at S-600 Pretreatment Unit), abated by A-622 and A-624 Biofilters and A-623 and A-625 Carbon Adsorption Systems	Authority to Construct/ Permit to Operate	NA	New Source
S-614	Wet Surface Air Cooler (at S-600 Pretreatment Unit)	Certificate of Exemption	Regulation 2-1- 128.4 (Water cooling towers and water cooling ponds not used for evaporative cooling of process water, or not used for evaporative cooling of water from barometric jets or from barometric condensers)	New Source Exempt

Source/ Abatement No.	Source/Abatement Description	Requested Permit Action	Permit Exemption (if applicable)	Status of Source
S-615	Evaporator (at S-600 Pretreatment Unit), abated by A-622 and A-624 Biofilters and A-623 and A-625 Carbon Adsorption Systems	Certificate of Exemption	Regulation 2-1-103 (Source not Subject to any District Rule and criteria pollutant emissions less than 10 lbs/highest day)	New Source Exempt
S-616	Collection Tanks (2), 21,134 gallons each (at S-600 Pretreatment Unit)	Authority to Construct/ Permit to Operate	NA	New Source
S-617	Renewable Feedstock Truck Unloading Operation	Certificate of Exemption	Regulation 2-1-123.3.6	New Source Exempt
S-618	Sulfuric Acid Tank (at S-600 Pretreatment Unit), 400 gallons	Certificate of Exemption	Regulation 2-1-123.2.1	New Source Exempt
S-619	Sulfiding Agent Vessel (at S-307 U240 UNICRACKING UNIT 240), 12,850 gallons	Certificate of Exemption	Regulation 2-1-123.2	New Source Exempt
S-620	Sulfiding Agent Vessel (at S-307 U240 UNICRACKING UNIT 240), 12,850 gallons	Certificate of Exemption	Regulation 2-1-123.2	New Source Exempt
S-621	Sulfiding Agent Vessel (at S-434 U246 High Pressure Reactor Train), 12,850 gallons	Certificate of Exemption	Regulation 2-1-123.2	New Source Exempt
A-598	Thermal Oxidizer (B-201 Main Burner, B-202 Reduction Furnace, B-203 Oxidation Furnace, B-204 Auxiliary Burner, and E-205 Waste Heat Boiler, 7.4 MMBtu/hr)	Authority to Construct/ Permit to Operate	NA	New Source
A-599	SO2 Scrubber (D-211 Venturi, D-212 Caustic Scrubber, D-213 Cold Stack)	Authority to Construct/ Permit to Operate	NA	New Source
A-600	Thermal Oxidizer (B-201 Main Burner, B-202 Reduction Furnace, B-203 Oxidation Furnace, B-204 Auxiliary Burner, and E-205 Waste Heat Boiler, 7.4 MMBtu/hr)	Authority to Construct/ Permit to Operate	NA	New Source
A-601	SO2 Scrubber (D-211 Venturi, D-212 Caustic Scrubber, D-213 Cold Stack)	Authority to Construct/ Permit to Operate	NA	New Source
A-606	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate	NA	New Source
A-607	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate	NA	New Source
A-608	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate	NA	New Source

Source/ Abatement No.	Source/Abatement Description	Requested Permit Action	Permit Exemption (if applicable)	Status of Source
A-609	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate	NA	New Source
A-610	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate	NA	New Source
A-611	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate	NA	New Source
A-612	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate	NA	New Source
A-613	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate	NA	New Source
A-614	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate	NA	New Source
A-615	Venturi-Jet Dust Filter, Kice Model VR16-6H, 665 scfm or equivalent, 0.002 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate	NA	New Source
A-616	Venturi-Jet Dust Filter, Kice Model VR16-6H, 665 scfm or equivalent, 0.002 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate	NA	New Source
A-617	Venturi-Jet Dust Filter, Kice Model VR16-6H, 665 scfm or equivalent, 0.002 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate	NA	New Source
A-618	Venturi-Jet Dust Filter, Kice Model VR16-6H, 665 scfm or equivalent, 0.002 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate	NA	New Source
A-619	Venturi-Jet Dust Filter, Kice Model VR16-6H, 665 scfm or equivalent, 0.002 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate	NA	New Source
A-620	Venturi-Jet Dust Filter, Kice Model VR16-6H, 665 scfm or equivalent, 0.002 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate	NA	New Source
A-621	Venturi-Jet Dust Filter, Kice Model VR16-6H, 665 scfm or equivalent, 0.002 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate	NA	New Source
A-622	Biofilter	Authority to Construct/	NA	New Source

Source/ Abatement No.	Source/Abatement Description	Requested Permit Action	Permit Exemption (if applicable)	Status of Source
		Permit to Operate		
A-623	PTU FOG Carbon Adsorption, 2,200 scfm maximum	Authority to Construct/ Permit to Operate	NA	New Source
A-624	Biofilter	Authority to Construct/ Permit to Operate	NA	New Source
A-625	PTU FOG Carbon Adsorption, 2,200 scfm maximum	Authority to Construct/ Permit to Operate	NA	New Source
A-626	Activated Carbon Vessel, 2 in parallel, while 2 are connected on standby	Authority to Construct/ Permit to Operate	NA	New Source
A-627	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum, abating S-601 Bleaching Earth Storage Silos (12) (exempt per 2-1-115.1.4.4, loading/unloading material with moisture content greater than or equal to 5% wt)	Certificate of Exemption	2-1-113.2.4 Any abatement device which is used solely to abate equipment that does not require an Authority to Construct or Permit to Operate	New Source
A-628	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Certificate of Exemption	2-1-113.2.4	New Source
A-629	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Certificate of Exemption	2-1-113.2.4	New Source
A-630	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Certificate of Exemption	2-1-113.2.4	New Source
A-631	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Certificate of Exemption	2-1-113.2.4	New Source
A-632	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Certificate of Exemption	2-1-113.2.4	New Source
A-633	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Certificate of Exemption	2-1-113.2.4	New Source
A-634	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Certificate of Exemption	2-1-113.2.4	New Source
A-635	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Certificate of Exemption	2-1-113.2.4	New Source
A-636	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Certificate of Exemption	2-1-113.2.4	New Source

Source/ Abatement No.	Source/Abatement Description	Requested Permit Action	Permit Exemption (if applicable)	Status of Source
A-637	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Certificate of Exemption	2-1-113.2.4	New Source
A-638	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Certificate of Exemption	2-1-113.2.4	New Source
A-639	Venturi-Jet Dust Filter, Kice Model VR16-6H, 665 scfm or equivalent, 0.002 gr/dscf PM10 maximum	Certificate of Exemption	NA	New Source
A-640	Venturi-Jet Dust Filter, Kice Model VR16-6H, 665 scfm or equivalent, 0.002 gr/dscf PM10 maximum	Certificate of Exemption	NA	New Source
A-641	Venturi-Jet Dust Filter, Kice Model VR16-6H, 665 scfm or equivalent, 0.002 gr/dscf PM10 maximum	Certificate of Exemption	NA	New Source
A-642	Venturi-Jet Dust Filter, Kice Model VR16-6H, 665 scfm or equivalent, 0.002 gr/dscf PM10 maximum	Certificate of Exemption	NA	New Source
A-643	Venturi-Jet Dust Filter, Kice Model VR16-6H, 665 scfm or equivalent, 0.002 gr/dscf PM10 maximum	Certificate of Exemption	NA	New Source
A-644	Venturi-Jet Dust Filter, Kice Model VR16-6H, 665 scfm or equivalent, 0.002 gr/dscf PM10 maximum	Certificate of Exemption	NA	New Source

1. IBP = Initial Boiling Point

2. S-446 and S-447 tanks are existing tanks that are not part of the Rodeo Renewed Project (no changes are proposed for these tanks). However, in accordance with Regulation 1-107 (Combination of Emissions), the required abatement efficiencies in Conditions #12131 and 12132 have been administratively revised from 95% to 98% to be consistent with the required abatement efficiency for A-7 Vapor Recovery System, which abates S-446 and S-447.

The facility currently has the capacity to produce approximately 120,000 barrels of petroleum-based products per day (bbls/day on a 12-month rolling average basis). Once the project is operational, no petroleum crude oil would be processed at the Rodeo Facility. Permit Condition #27646 will prohibit the processing of crude oil at this facility post-project. Upon project completion, this facility will produce a maximum of 67,000 bbls/day on a 12-month rolling average basis of renewable fuels. The following table summarizes the post-project production (renewable fuels) and throughput (renewable feedstocks) limits.

**Table 1 – Phillips 66 San Francisco Refinery Throughput Limits**

Source	Limit (Daily)	Limit (Annual)	Type of Limit	New Permit Condition #
Facility-wide (S-307 U240 Unicracking Unit, S- 434 U246 High Pressure Reactor Train, and S-460 U250 Ultra-Low Sulfur Diesel Hydrotreater)	N/A See below for individual source limits	67,000 bbls per day produced in any consecutive 12- month period	Renewable Fuels Production Limit	Condition #27647
S-307	42,000 bbls per calendar day	15,330,000 bbls in any consecutive 12-month period	Renewable Feedstocks Throughput Limit	Condition #27647

Source	Limit (Daily)	Limit (Annual)	Type of Limit	New Permit Condition #
S-309	16,740 bbls per calendar day	6,110,100 bbls in any consecutive 12-month period	Renewable Jet Throughput Limit	Condition #27647
S-434	30,000 bbls per calendar day	9,855,000 bbls in any consecutive 12-month period	Renewable Feedstocks Throughput Limit	Condition #27647
S-307 and S-434 (combined)	69,000 bbls processed per calendar day	25,185,000 bbls in any consecutive 12-month period	Renewable Feedstocks Throughput Limit	Condition #27647

To maintain current facility capacity to supply regional market demand for transportation fuels, including renewable and conventional fuels, Phillips 66 could receive, blend, and ship up to 40,000 bbls/day on a 12-month rolling average of gasoline and gasoline blend stocks, but the daily maximum throughput limit of 113,150 bbls/day per Condition #22549 will remain the same.

Project construction will take approximately 21 months. Phillips 66 is planning to utilize as much existing equipment and infrastructure as possible for receiving, transferring, and storing future feedstocks and products. The renewable feedstocks may include, but are not limited to soybean oil, tallow, used cooking oil, inedible corn oil, canola oil, fats, oils, and grease (FOG) and other vegetable-based oils. However, palm oil will not be used. As part of the project, the facility will be updating its Source Industrial Classification Code from 2911 (Petroleum Refining) to 2869 (Industrial Organic Chemicals, Not Elsewhere Classified).

#### *Project & Process Overview*

The proposed project consists primarily of a change in production processes rather than a change in facilities (i.e., construction), as it will mostly use existing refining equipment and transportation facilities. The major change will be the elimination of crude oil processing and the use of renewable feedstocks to manufacture renewable fuels. The renewable fuels are expected to include renewable diesel, renewable gasoline, renewable naphtha, renewable jet.

Many existing sources will be repurposed and new sources such as the pretreatment unit, wastewater treatment equipment, and a sour water stripper thermal oxidizer will be added to the process to accommodate the renewable feedstocks. In addition, various existing refinery units will be shut down as part of this project. Detailed descriptions and changes for various sources and processes are discussed below. See Figure 1 for a block flow diagram of Phillips 66 San Francisco Refinery Rodeo Renewed Project.



# Rodeo Facility Post Project Block Flow diagram

## Drawing Symbol Legend

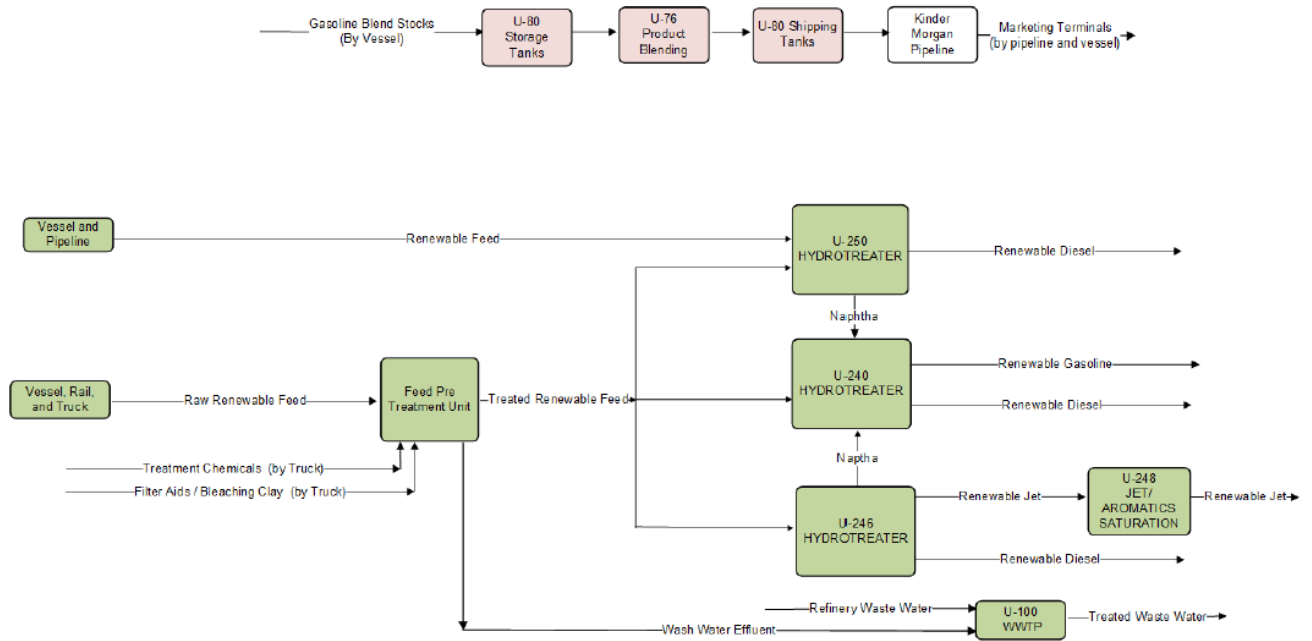


Figure 1 – Phillips 66 San Francisco Refinery Renewable Fuels Block Flow Diagram

### *Feedstock Receiving*

Raw renewable feedstocks will be received via truck (at the existing but currently unpermitted Truck Unloading Operation<sup>2</sup>, which will now be assigned S-617 and will be named Renewable Feedstock Truck Unloading Operation), rail (at the existing S-70 Butane Loading Rack, which will be renamed S-70 Rail Renewable Feedstock Unloading Rack), and vessels at the Marine Terminal Loading Berths M1 and M2 (S-425 and S-426, respectively). Pretreated renewable feedstocks will also be received from vessels at S-425 and S-426 and via pipeline. Gasoline blend components will be received by vessel, and finished gasoline will be shipped by pipeline and vessel. The project will result in increased rail and marine traffic due to the renewable feeds and products. Truck traffic will decrease because coke product will no longer be trucked out and sulfur production will be significantly reduced. Phillips 66 is proposing to receive renewable feedstocks as well as finished petroleum products at Marine Terminal Loading Berths M1 and M2 (S-425 and S-426, respectively). Finished petroleum product will not be processed at the facility, but will be blended and distributed locally. See Figure 3 for a block flow diagram of the facility's product distribution operation.

The only feedstock receiving source that will undergo physical changes will be S-70. The existing butane rail loading stations will be repurposed for the unloading of renewable feedstocks into feed tanks, and new steam piping connections will be installed to warm up and liquify renewable feedstocks in rail cars prior to unloading. S-70 is currently exempt for unloading liquefied gases under Regulation 2-1-123.3.1 and will be exempt under Regulation 2-1-123.3.2 for unloading organic liquids with an initial boiling point that is greater than 302 degrees F and exceeds the actual storage temperature by at least 180 degrees F. It will also meet the backstop provisions in Regulation 2-1-319 as required under this exemption, including the 5 tons/yr backstop provision in Regulation 2-1-319.1 and the Regulation 2-1-319.2 requirement to meet Section 2-1-316, 317, or 318, as demonstrated in Appendix D.

### *Feedstock Storage*

Two existing storage tanks (S-97 and S-108), discussed further below, will be repurposed to store renewable feedstocks. Changes include adding odor management best practices (carbon canisters and nitrogen blanket) and insulating the wall. New jet mixers will be installed on tank side walls and an epoxy coating will be applied to the floors, walls, roof, and internals.

S-90, S-108, S-204, and S-205 are currently exempt from permitting pursuant to Regulation 2-1-123.3.2 and will additionally meet new exemption requirements pursuant to Regulation 2-1-123.3.6 (storage of tallow and vegetable oil). S-32120 is currently exempt from permitting pursuant to Regulation 2-1-123.3.2 and will continue to meet the same exemption, as well as Regulation 2-1-123.3.6. All of these sources will also meet the backstop provisions in Regulation 2-1-319 as required under these exemptions, including the 5 tons/yr backstop provision in Regulation 2-1-319.1 and the Regulation 2-1-319.2 requirement to meet Section 2-1-316, 317, or 318, as demonstrated in Appendix C.

S-139 is a permitted source and Phillips 66 is proposing to add renewable feedstock as a storage material. This change does not result in an increased PTE; therefore, S-139 is an altered source. To ensure that S-139 is an altered, not modified, source and to allow for operational flexibility (the ability to store both petroleum-based and renewable-based materials), permit conditions will limit daily and annual throughputs and PTE to S-139's pre-project levels. More details are provided in the Emissions Calculation section below.

S-110 will store both raw and pretreated feedstocks. S-110 will also serve as an off-spec tank, where pretreated feedstocks will be tested to determine whether they meet specifications.

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<sup>2</sup> The existing Truck Unloading Operation is currently not permitted because emissions from unloading are attributed to the respective storage tanks downstream. A source number and a Certificate of Exemption will be issued for this source.

S-97, S-110, S-111, S-112, S-113, S-114, S-135, S-137, S-173, S-174, S-175, S-334, S-340, S-360, S-445, S-449, and S-506 are permitted sources. Post-project, Phillips 66 is proposing exclusively exempt service (storage of renewable feedstocks and other exempt materials only) for these tanks. Therefore, these tanks will meet the exemption in Regulations 2-1-123.3.2 and 2-1-123.3.6 (storage of tallow and vegetable oil). These sources will also meet the backstop provisions in Regulation 2-1-319 as required under these exemptions, including the 5 tons/yr backstop provision in Regulation 2-1-319.1 and the Regulation 2-1-319.2 requirement to meet Section 2-1-316, 317, or 318, as demonstrated in Appendix C.

A subset of these exempt tanks (referred to as “Subset #1” below) — specifically, S-97, S-110, S-114, S-174, S-175, S-334, S-360, S-449, and S-506 — will be operated in exempt service upon start-up of Rodeo Renewed under Application 31157. Start-up of Rodeo Renewed is when S-307 and/or S-434 begin processing renewable feedstock. After issuance of the Authorities to Construct, and prior to start-up of Rodeo Renewed under Application 31157, Phillips 66 plans to clean these tanks (to remove residual petroleum-based organics prior to their transition to exclusively exempt service) concurrently with the conversion of S-307 and S-434 during the facility’s turnaround. These tanks will retain their existing permits until start-up of Rodeo Renewed.

The other exempt tanks (referred to as “Subset #2” below) — specifically, S-111, S-112, S-113, S-135, S-137, S-173, S-340, and S-445— will not be operated in exempt service immediately upon start-up of Rodeo Renewed (as defined above). Instead, they will be transitioned to exempt service at a later time. At some later time (for each tank) after start-up of Rodeo Renewed, Phillips 66 will clean the tank (to remove residual petroleum-based organics prior to their transition to exclusively exempt service) and then operate it in exempt service. After start-up of Rodeo Renewed, these tanks will be prohibited (per Permit Condition #27646) from loading petroleum-based organic materials though they may continue to store and unload such materials. These tanks will retain their existing permits until start-up of Rodeo Renewed, at which time new Permit Condition #27646 will be effective until they switch to exempt material.

The distinction between Subset #1 and Subset #2 is that Subset #1 will immediately operate in exempt service upon startup of the Rodeo Renewed Project, while Subset #2 will operate in exempt service at a later time.

For both Subsets #1 and #2, Phillips 66 will be required under the aforementioned permit condition to notify the Air District after the service change of each of these tanks from permitted organic petroleum materials to exempt material, at which point Phillips 66 will relinquish the permit for each given tank and the Air District will issue the Certificates of Exemption.

The table below summarizes the physical changes proposed for these tanks. The tanks listed in the table below are the only feedstock storage tanks that will be physically changed. The other feedstock storage tanks will store renewable feedstock but will not be physically changed.

**Table 2 – Feedstock Storage Tanks with Physical Changes**

Source No.	Description	Physical Changes
S-97 [exempt per 2-1-123.3.2 and 2-1-123.3.6]	Tank 100, Renewable Feedstock (raw)	<ul style="list-style-type: none"> <li>- Convert external floating roof to cone roof with vapor control (abated via carbon adsorption system)</li> <li>- Vapor space will be nitrogen blanketed</li> </ul>

Source No.	Description	Physical Changes
		<ul style="list-style-type: none"> <li>- steam coil added for emergency if heat exchanger is down;</li> <li>- Add insulation; Tank temperature: 130 degrees F</li> </ul>
S-108 [exempt per 2-1-123.3.2 and 123.3.6]	Tank 153, FRT, Distillate Oil, Gas Oil, Renewable Feedstock (after pretreatment)	<ul style="list-style-type: none"> <li>- Convert internal floating roof to cone roof with vapor control (abated via carbon adsorption system)</li> <li>- Vapor space will be nitrogen blanketed</li> <li>- steam coil added for emergency if heat exchanger is down;</li> <li>- Add insulation; Tank temperature: 130 degrees F</li> </ul>
S-334 [exempt per 2-1-123.3.2 and 123.3.6]	Tank 107, EFRT, Crude Oil, Renewable Feedstock (after pretreatment)	<ul style="list-style-type: none"> <li>- Minor floor repairs and new coating of floor and shell</li> </ul>

*Pretreatment Unit (PTU) and Material Handling*

A new feed PTU (S-600) will remove impurities from the raw renewable feedstocks before processing at the existing Unit 240 (S-307) and Unit 246 (S-434). Impurities such as solids may harm the reactor catalysts. The process includes a combination of vacuum drying, adsorption, filtration, centrifugal separation, and fats/oils/grease (FOG) recovery. The proposed maximum daily and annual throughput of S-600 will be 80,000 barrels per day and 29,200,000 barrels in any consecutive 12-month period for all three trains combined.

The PTU (S-600) will consist of three parallel processing trains to pretreat the raw feedstocks. Two of the trains will have a polyethylene removal section. All three trains will have acid washing/special degumming section and an adsorption section. As described below, supporting processes include closed loop systems (to collect, control, and discharge all vapors and gases from the process to a vapor treatment system, A-622 through A-625, as described below), a Clean in Place (CIP) System, and a wastewater conditioning system. Wastewater from the PTU will be processed at the existing Wastewater Treatment Plant. The removed metals and phosphorus will end up in waste products (sludge) and be properly disposed. Two trains will be built now and the third one will be built later depending on the market.

New equipment includes a Wet Surface Air Cooler (WSAC), tanks, material feed hoppers and bulk silos, a dissolved air flotation unit, filters mixers, heat exchangers and centrifuges.

The PTU includes a FOG (fats, oils, and grease) recovery process that consists of tanks, vessels, and evaporator units to remove organic material from process wastewater before treatment at the existing facility wastewater treatment plant. Removed organic matter is concentrated to remove excess moisture before being loaded onto trucks for shipment outside of the facility. All tanks, process vessels, and the dissolved air flotation unit (DAF) are connected to a Closed Loop Vapor Collection System, similarly to the PTU trains. All collected vapors from the

Closed Loop Vapor Collection Systems are sent to the Vapor Treatment System (A-622 through A-625) . Each Closed Loop Vapor Collection System/Treatment System will be a source of emissions.

The Vapor Treatment System's collected vapors are treated for VOC removal using 2-stage treatment technology before being released to atmosphere. The proposed 1<sup>st</sup> stage treatment is a fully enclosed biofilter (A-622 and A-624) and the 2<sup>nd</sup> stage unit is activated carbon adsorption (A-623 and A-625).

The biofilter uses microorganisms to degrade organic constituents in the vapor to carbon dioxide and water. The biofilter reactor consists of three major sections: the lower section, the middle section, and the upper section.

Vapors collected from the PTU enter the lower section of the biofilter. The lower section is an empty space allowing the collected vapor to flow upward and equally distribute through the media. The middle section is filled with media allowing microorganisms growth on it. The media can be compost peat, wood chips, tree bark, or proprietary materials supplied by the biofilter provider. The media provides a large surface area, nutrients, and moisture for microbial activities and adsorption of organic molecules. The treated vapor is discharged from a nozzle located at the upper section of the biofilter to the downstream activated carbon bed for polishing. The upper section is also an empty space allowing the spray water to equally distribute to the media to maintain bed moisture level under the suitable level for bacteria growth. The excess water sprayed from the upper section through the media will cascade down to the lower section, and then drain to the existing Unit 100 Wastewater Treatment Plant for treatment. A water seal design on the biofilter drain prevents the vapor from releasing the biofilter without being treated through the system. A bypass line bypasses the biofilter to the activated carbon bed. This allows operations to temporarily shut down the biofilter system during maintenance periods without shutting down the complete treatment system. Permit Condition #27649 requires several parametric levels to be monitored, maintained, and recorded on a daily basis, including average pH, pressure drop across the biofilter bed, and a minimum water spray rate, and an alarm system that alerts the owner/operator prior to any exceedances.

The activated carbon adsorption unit is a proven technology for removing volatile organic compounds from the inlet air stream. The activated carbon is replaced and disposed periodically when the bed reaches its breakthrough point. A two-canister system in parallel is implemented to ensure there is no breakthrough to atmosphere. Two additional spare vessels are also connected and on standby. A line bypassing the activated carbon beds will allow operations personnel to continue to use the biofilter during replacement of the spent activated carbon. Because there are two biofilters (A-622, A-624), one biofilter will always be in operation, even if the other one is undergoing maintenance. During periodic maintenance, only one biofilter will be taken out of service. The other biofilter and both of the carbon beds will still be in operation. Permit Condition 27649 requires that the PTU system be controlled with at least one biofilter and one carbon vessel when S-600 is in operation.

Materials used in the pretreatment process (such as bleached earth and filter aid) are delivered to S-600 Pretreatment Unit via bulk silos (S-601 and S-602) and material feed hoppers (S-603 through S-605).

The following is a discussion of the exempt sources at S-600 PTU. All of the exempt sources described below will meet the backstop provisions in Regulation 2-1-319 as required under this exemption, including the 5 tons/yr backstop provision in Regulation 2-1-319.1 and the Regulation 2-1-319.2 requirement to meet Section 2-1-316, 317, or 318, as demonstrated in Appendix H.

S-601 Bleaching Earth Storage Silos will be exempt per Regulation 2-1-115.1.4.4 (Operating, loading and unloading the following sources which process exclusively material with a moisture content greater than or equal to 5 percent by weight for storage silos). S-604 Bleaching Earth Adsorption Day Hoppers will be exempt per Regulation 2-1-115.1.4.5 (Operating, loading and unloading the following sources which process exclusively material with a moisture content greater than or equal to 5 percent by weight for storage or weigh hopper/bin system). S-607 and S-618 Sulfuric Acid Tanks will be exempt per Regulation 2-1-123.2.1 (Sulfuric acid with an acid strength of less than or equal to 99.0% by weight). S-608 Citric Acid Tank, S-609 Sodium Hydroxide Tank, S-610 Coagulant Tank, and S-611 Polymer Tank are exempt per Regulation 2-1-123.2 (Tanks, vessels and pumping equipment used exclusively

for the storage or dispensing of any aqueous solution which contains less than 1 percent (wt) organic compounds). S-614 Wet Surface Air Cooler will be exempt per Regulation 2-1-128.4 (Water cooling towers and water cooling ponds not used for evaporative cooling of process water, or not used for evaporative cooling of water from barometric jets or from barometric condensers). S-615 Evaporator will be exempt Regulation 2-1-103 (Source not Subject to any District Rule and criteria pollutant emissions less than 10 lbs/highest day). The proposed pulse jet dust houses (A-627 through A-638) will be exempt per Regulation 2-1-113.2.4 (Any abatement device which is used solely to abate equipment that does not require an Authority to Construct or Permit to Operate).

#### *Hydrodeoxygenation (HDO) Process*

Unit 240 Unicracking Unit/Hydrotreater (S-307) and Unit 246 Hydrocracking Unit/Hydrotreater (S-434) will undergo physical changes to operate as HDO units, the principal process in creating renewable fuels. S-307 and S-434 will be capable of processing renewable feed to produce renewable diesel, renewable jet fuel and renewable naphtha.

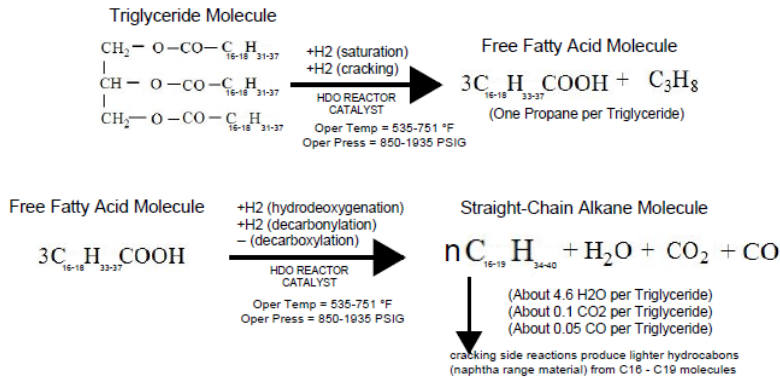
At S-307, two existing reactor vessels that are at the end of their useful life will be replaced. The renewable feed is much lower in sulfur than petroleum feedstock feed. It is necessary to use a sulfiding agent on the catalyst and amine for stabilization. Two new chemical tanks and injection pumps will be installed. The existing heat exchangers will be replaced and/or adapted for new process conditions. A new process surge vessel and charge pump and feed filters will also be added. Four distillation towers will be retrayed.

After the project the Unit 246 Hydrocracker (S-434) will process renewable feed to produce renewable diesel, renewable jet fuel, and renewable naphtha. As part of the project, existing heat exchangers would likely be replaced and exempt minor chemical storage tanks (the permit exemption is discussed below), and feed filters will be added. Two distillation towers will be retrayed.

The equipment changes mentioned above at U240 and U246 are required to accommodate the processing of renewable fuels, which involves changing the process flow and re-routing materials to sources upstream and downstream of U240 and U246, which will thereby necessitate additional and replacement fugitive components and piping. Emissions associated with changes are all fugitive in nature and are less than 10 lbs/day at each unit which fits within the exemption in Regulation 2-1-128.21. The fugitive components are subject to BACT and offsets consistent with Regulation 2-1-128.21.5. Based on the aforementioned changes in the method of operation (to process renewable fuels, to convert these units to HDO units, to re-route materials to both upstream and downstream sources, and to add or replace fugitive components and piping), the Air District determined that S-307 and S-434 will be modified sources. The post-project toxicity-weighted emissions are lower than pre-project, an HRA is not required for S-307 and S-434, as shown in Appendix J.

Permit Condition 27647 (which replaces the existing Condition 22965 with same daily throughput limit) limits the combined throughput of S-307 and S-434 to 69,000 barrels/day. No changes are proposed to this limit other than incorporating the processing of renewable feedstocks. Since this grouped limit is not changing, the corresponding debottlenecking analysis which was previously performed under Application 27954 remains valid and applicable to all existing upstream and downstream sources. Additionally, Permit Condition 27647 (which replaces existing Condition 22969) will be imposed to limit the individual throughput at S-434 to 30,000 barrels/day and/or 9,855,000 barrels in any consecutive 12-month period.

The hydrodeoxygenation process consists of two steps shown below:



**Figure 2 – Hydrodeoxygenation Process**

In the first step, the triglyceride molecule reacts with hydrogen to form free fatty acid molecule and propane. In the second step, hydrodeoxygenation and decarbonylation take place to convert free fatty acid molecule to straight-chain alkane molecule and light hydrocarbons (naphtha). The HDO processes are expected to produce ammonia (NH<sub>3</sub>) from organo-nitrogen compounds in the feedstocks undergoing a denitrification reaction, which converts nitrogen to ammonia, and hydrogen sulfide (H<sub>2</sub>S) from catalyst sulfiding agent decomposition.

**Table 3 – Hydrodeoxygenation Sources with Physical Changes**

Source No.	Description	Physical Changes
S-307 [Modified]	U240 Unicracking Unit 240	<ul style="list-style-type: none"> <li>- Replace two existing reactor vessels at end of life.</li> <li>- Replace and modify existing heat exchangers.</li> <li>- Add new process surge vessel, charge pump, minor chemical storage vessel* and feed filters.</li> <li>- Retray four existing distillation towers.</li> </ul>
S-434 [Modified]	U246 High Pressure Reactor Train at Hydrocracking/Hydro treater U246	<ul style="list-style-type: none"> <li>- Replace heat exchanger</li> <li>- Add minor chemical storage vessels*, feed filters</li> <li>- Retray two existing distillation towers</li> </ul>

\*The proposed minor chemical storage vessels at S-307 and S-434 store a sulfiding agent, Di-tert-butyl polysulfide (CAS No 68937-96-2), and will be assigned source numbers S-619 (at S-307), S-620 (at S-307), and S-621 (at S-434). Each vessel is approximately 12,850 gallons. The vessels are exempt from permitting per Reg 2-1-123.3.2 because the initial boiling point of the chemical is 249 C (480 F) and exceeds the actual storage temperature by more than 180F. Also, minimal POC and TAC emissions are expected from these vessels during normal operation, as shown in Appendix C.

Existing process heaters (S-11, S-12, and S-13 (which serve S-307) and S-45 (which serves S-434)) permitted to fire natural gas and refinery fuel gas will undergo a change in method of operation to fire natural gas and renewable fuel gas for the HDO units. No physical changes are proposed to these existing process heaters. The properties of the fuel gas will change from the production of renewable fuels, but the renewable fuel gas combusted in the heaters will have a similar or lower heat content on a volumetric basis (Btu/scf) and less sulfur due to changes in facility operations. See Appendix A for more detail on the Phillips 66 fuel gas system and renewable fuel gas properties. The Air District has confirmed (as shown in Appendix A) that firing renewable fuel gas will not exceed the pre-project PTE from firing refinery fuel gas). Therefore, these sources are considered altered, and not modified. The Air District will require Phillips 66 to confirm that the post-project emissions will not exceed pre-project levels per Condition #27646.

#### *Isomerization Process*

U248 Unisar Unit 248 (S-309) will serve as a renewable jet isomerization unit. S-309 will continue to operate in a similar manner as the existing unit, processing stripped product from the upstream S-434. No physical changes to S-309 will be made to accommodate the processing of renewable feedstocks. However, the processing of renewable feedstocks constitutes a change in the method of operation. Therefore S-309 will be an altered source. Emissions from S-309 are solely from fugitive emissions from equipment leaks. Since there are no new or replacement components proposed for S-309, there will be no increase in fugitive emissions.

An existing process heater (S-22) permitted to fire natural gas and refinery fuel gas will undergo a change in method of operation to fire natural gas and renewable fuel gas for S-309. No physical changes are proposed to S-22. The properties of the fuel gas will change from the production of renewable fuels, but the renewable fuel gas combusted in S-22 will have a similar or lower heat content on a volumetric basis (Btu/scf) and less sulfur due to changes in facility operations. See Appendix A for more detail on the Phillips 66 fuel gas system and renewable fuel gas properties. The Air District has confirmed (as shown in Appendix A) that firing renewable fuel gas will not exceed the pre-project PTE (from firing refinery fuel gas). Therefore, S-22 is considered altered, and not modified. The Air District will require Phillips 66 to confirm that the post-project emissions will not exceed pre-project levels per Condition #27646.

#### *Renewable Diesel/Renewable Jet Storage*

After undergoing the HDO process at S-307 or S-434 and/or isomerization (in the case of renewable jet fuel) at S-309, the renewable diesel and renewable jet product will then be pumped into existing storage tanks, as described below.

S-99, S-103, S-105, S-127, S-262, and S-263 are currently exempt and will continue to meet the exemption requirements pursuant to Regulation 2-1-123.3.2, storage of organic liquids with an initial boiling point that is greater than 302°F and exceeds storage temperature by at least 180°F, and will also meet the backstop provisions in Regulation 2-1-319 as required under this exemption, including the 5 tons/yr backstop provision in Regulation 2-1-319.1 and the Regulation 2-1-319.2 requirement to meet Section 2-1-316, 317, or 318, as demonstrated in Appendix C. S-254, S-256, S-257, , S-341, and S-342 are currently permitted to store a variety of petroleum-based fuels. Phillips 66 is proposing to repurpose these tanks to store renewable diesel and renewable jet and maintain the ability to store petroleum-based fuels. The proposed changes do not result in an increased PTE; therefore, these tanks are altered sources. Permit conditions will limit daily and annual throughputs to the pre-project levels to ensure that these tanks are altered, not modified, sources and to allow for operational flexibility. More details are provided in the Emissions Calculation section below.

S-261 and S-448 are currently permitted to store a variety of petroleum-based fuels. Phillips 66 is proposing to repurpose these tanks to exclusively store renewable diesel and other exempt products. These materials meet the exemption requirements pursuant to Regulation 2-1-123.3.2, storage of organic liquids with an initial boiling point that is greater than 302°F and exceeds storage temperature by at least 180°F, and will also meet the backstop provisions in Regulation 2-1-319 as required under this exemption, including the 5 tons/yr backstop provision in Regulation 2-1-319.1 and the Regulation 2-1-319.2 requirement to meet Section 2-1-316, 317, or 318, as demonstrated in Appendix C.

S-261 and S-448 will continue to be operated in petroleum-based service, as allowed under the existing permits. After issuance of the Authorities to Construct under Application 31157, and prior to start-up of Rodeo Renewed, Phillips 66 plans to clean these tanks (to remove residual petroleum-based organics prior to their transition to



exclusively exempt service) concurrently with the conversion of S-307 and S-434 during the facility's turnaround. Therefore, these tanks will retain their existing permits until such time that these tanks transition to exclusively exempt service. These tanks will immediately operate in exempt service upon startup of the Rodeo Renewed Project. Phillips 66 will be required under Permit Condition #27646 to notify the Air District after the service change of each of these tanks from permitted organic petroleum materials to exempt feedstocks, at which point Phillips 66 will relinquish the permit for each given tank and the Air District will issue the Certificates of Exemption.

#### *Renewable Gasoline/Naphtha Storage*

Products from Unicracking Unit 240 (S-307) will be stored in existing storage tanks. S-122, S-125, S-126, S-137 (phased in), S-139, S-140, S-150, and S-506 are permitted sources, and Phillips 66 is proposing to add renewable gasoline and/or renewable naphtha as a storage material. This change does not result in an increase in PTE therefore, these tanks are altered sources. Permit conditions will limit daily and annual throughputs to the pre-project levels to ensure that these tanks are altered, not modified, sources and to allow for operational flexibility. More details are provided in the Emissions Calculation section below.

#### *Finished Product Loading and Distribution*

Renewable products will be transported and distributed primarily via pipeline and using marine vessels at S-425 and S-426. Finished gasoline will be transported and distributed via pipeline. Truck traffic is expected to decrease because coke product will no longer be trucked out and sulfur production will be significantly reduced.

As stated above, no physical changes are proposed for S-425 and S-426. Also, there will be no increase in any criteria pollutant PTE, so these sources will be altered sources.

#### *Wastewater Treatment Plant*

Existing wastewater treatment equipment will operate in a similar manner after the project, but piping will be added to route wastewater from the Pretreatment Unit (S-600) to the Wastewater Treatment Plant, immediately upstream of Aeration Tank, PACT (F-201) and Aeration Tank, PACT (F-202) (S-381 and S-382, respectively). The wastewater composition and flow rates will reflect the wastewater that is generated from these upstream operating units. The wastewater composition will change as a result of the aforementioned new piping connection, but it will not result in any increased PTE.

See Table 4 below for a list of wastewater treatment sources upstream and downstream of the aforementioned new piping connection.

The sources upstream of the tie-in at the wastewater treatment plant will change as a result of changing compositions due to operating in renewable-based mode – sour water and process water that will be processed at these sources. However, these sources will remain subject to the existing wastewater throughput limit of 3.68 E+09 gal/year in Permit Condition 20989 Part A and there will be no increased PTE. Thus, all of these upstream sources will be altered and not modified sources.

The downstream sources will also remain subject to the existing wastewater throughput limit of 3.68 E 9 gallons/year in Permit Condition 20989. Thus, all sources downstream of the new piping connection will also be altered and not modified sources.

**Table 4 – Wastewater Treatment Plant Sources**

<b>Wastewater Treatment Plant Sources <u>Upstream</u> of New Piping Connection</b>	
S-101	Tank 104 Storm Water Equalization
S-102	Tank 105 Storm Water Equalization
S-106	Tank 130 Stormwater Equalization
S-400	Wet Weather Wastewater Sump (with vented cover A-40 Wet Weather Sump Vented Cover)
S-401	Dry Weather Wastewater Sump (with vented cover, A-41 Dry Weather Sump Vented Cover)
S-1008	U100_Primary Stormwater Basin
S-1009	U100_Main Stormwater Basin
<b>Wastewater Treatment Plant Sources <u>Downstream</u> of New Piping Connection</b>	
S-381	Aeration Tank, Pact (F-201), 1.2 MM gallons
S-382	Aeration Tank, Pact (F-202), 1.2 MM gallons
S-383	Clarifier, F-203, 0.69 MM gallons
S-384	Clarifier (F-204), 0.69 MM gallons
S-385	Media Filter (F-271 to F-278), 420,000 gallons/hr
S-386	PAC Regeneration Sludge Thickener (F-211), 44,000 gallons
S-387	Wet Air Regeneration (P-202), 15 gpm
S-390	F-248 Thickened Sludge Storage, 38,00 gallons

*Sour Water Stripper and Amine Gas Treatment System*

Sour water contains sulfur compounds or ammonia and is produced whenever steam is condensed in the presence of gases containing these compounds, including hydrotreating and sulfur plant tail gas treatment. Sour water is odorous and must be treated to remove sulfur compounds and ammonia prior to discharge into the Wastewater Treatment Plant.

During petroleum refining operations, H<sub>2</sub>S and NH<sub>3</sub> are processed at Unit 236 Sulfur Plant (S-1002), Unit 238 Sulfur Plant (S-1003), and Unit 235 Sulfur Recovery Unit (S-1010).

The existing Sour Water Strippers and Amine Gas Treatment Systems are considered part of existing S-1002 Unit 236 Sulfur Recovery Unit and were not assigned a source number. Since S-1002 will be demolished as part of this project, the associated Sour Water Strippers and Amine Gas Treatment Systems will be assigned a new source number, S-599.

The project will result in less amine acid gas and sour water acid gas to process. Two of the three existing Sulfur Recovery Units (S-1002 and S-1003) will be shut down. S-1010 will remain operational and be used primarily as a backup to the new Unit 237 Sulfur Treatment Unit (STU) that will be abating S-599 during normal operations. S-1010 will be used as necessary during planned (expected to occur once every 3 years) and unplanned outages (emergencies) of the thermal oxidizers and/or scrubbers at the new sulfur treatment unit, as indicated in Condition #27648. Unit 237 STU is a new abatement package consisting of two trains. Each train will have a thermal oxidizer (A-598 for Train #1 and A-600 for Train #2) followed by an SO<sub>2</sub> caustic scrubber (A-599 for Train #1 and A-601 for Train #2). The oxidizer converts H<sub>2</sub>S to SO<sub>2</sub> and converts the ammonia primarily to nitrogen, with some residual NO<sub>x</sub> formation. The caustic scrubber removes the SO<sub>2</sub>. The treated exhaust gas from the scrubber will be vented to atmosphere through a cold stack.

S-1010 will serve as a backup unit for Unit 237 STU for planned (expected once every 3 years) and unplanned outages (emergencies). When S-1010 is used as a backup for Unit 237 STU during an outage, Condition #27818 will require the owner/operator to meet the most stringent emissions limits of either Conditions #27818 (for S-1010)

and/or #27648 (for S-599 and Unit 237 Sulfur Treatment Unit). This requirement ensures that there will not be an increase in PTE at S-1010.

At each thermal oxidizer, acid gas is combusted in the oxygen deficient reduction furnace to destroy virtually all NH<sub>3</sub> while minimizing NO<sub>x</sub> formation. As required under Condition #27648, reduction furnace temperature is designed to be operated at a minimum of 2100°F for stable combustion and near-complete NH<sub>3</sub> destruction. Because ammonia is being directly combusted, there is more nitrogen present than typical thermal oxidizer combustion where the only source of nitrogen is combustion air. Therefore, there is opportunity for NO<sub>x</sub> formation. Combustion products are subsequently quenched with air for thermal oxidation of residual combustibles in the oxidation furnace.

At each of the two SO<sub>2</sub> caustic scrubbers, SO<sub>2</sub> will be quenched and scrubbed with a circulating caustic stream through a packed bed for SO<sub>2</sub> absorption. A continuous caustic stream will be added to the scrubbers to maintain a sufficient pH to prevent equipment corrosion and ensure high SO<sub>2</sub> absorption. The exhaust gas from the scrubbers is vented to atmosphere via a new stack supported by the column.

Equipment associated with Unit 235 (S-1010), including Unit 235 Sulfur Pit Tank (S-465) and Sulfur Storage Tank (S-503, which is located within Unit 235), and S-504 Sulfur Degassing Unit, will remain operational and the permits for this equipment will be retained. There will not be any increases in PTE above permitted levels at these sources. Therefore, these sources are considered altered.

Condition #27648 exempts S-599 from the requirement to meet the NO<sub>x</sub> concentration of 150 ppm @ 3% O<sub>2</sub> specified in Condition #27648 during startup/shutdown (not to exceed 36 hours per startup/shutdown event) and refractory changeout (not to exceed 60 hours per changeout event). The enforceable permit condition annual emissions limits already account for and include emissions that occur during startups, shutdowns, and refractory changeouts.

Air District-approved continuous emissions monitoring systems (CEMS) for NO<sub>x</sub> and SO<sub>2</sub> emissions will be required to be installed and operated at S-599 per Condition #27648, respectively, because:

- 1) Regulation 1-520.4 requires and will continue to require that the existing S-1010 (which, as mentioned above, will serve as a backup unit to Unit 237 STU) to have a CEMS, and this will ensure that the monitoring requirements at Unit 237 STU will remain as stringent as those for S-1010;
- 2) Emissions, although lower than for S-1010, will still trigger BACT requirements, which warrants inclusion of a CEMS; and
- 3) Continuous monitoring ensures that compliance can be demonstrated on a continuous basis and that the vendor-guaranteed emissions levels are accurately estimated for this new process (sulfur treatment).

#### *Hydrogen Plant (S-437 Hydrogen Manufacturing Unit)*

The Hydrogen Plant (S-437) produces hydrogen and steam for use in hydrotreaters and other refinery processes within the Rodeo Refinery. The Hydrogen Plant includes a steam methane reformer furnace (S-438), associated stack, and other equipment, including a compressor, cooler, and associated piping. Hydrogen is generated by reacting a petroleum liquid or gas, such as butane or natural gas, with steam in the presence of a catalyst. The steam methane reformer furnace is a process furnace that is used to maintain the reactants at a temperature that favors the production of hydrogen. The exhaust gases from the steam methane reformer furnace are passed through a selective catalytic reduction gas treatment unit to reduce the emissions of oxides of nitrogen created from the combustion that takes place in the furnace. The hydrogen formed in this equipment is purified by a process called pressure swing adsorption and then is delivered to the units that use hydrogen gas.

These processes will remain the same post-project, and there will be no increased PTE at S-438. In order to accommodate the processing of renewable feedstocks, the following physical changes will be made to S-437: Install new piping, fuel gas cooler, and control valve station to process renewable fuel gas at Unit 110 to produce renewable hydrogen. These changes will result in increased fugitive emissions, which were included in the Air

District's analysis. S-437 is altered, and not modified, because the increase in fugitive emissions fits within the Regulation 2-1-128.21 exemption.

#### *Cooling Towers*

Phillips 66 has 7 permitted cooling towers at the facility, of which three (3) will be idled (S-452, S-457, and S-458) as part of this project. However, Phillips 66 will retain permits for all of these cooling towers. The remaining four (4) cooling towers (S-453, S-455, S-456, and S-500) will serve the repurposed process units and will continue to operate. The proposed changes will not result in increased PTE. Therefore, the cooling towers will be altered, not modified.

#### *Flares*

The existing flare system that will be kept online includes the C-1 Flare (S-296) and MP-30 Flare (S-398). The facility plans to retain the permits for both of these flares.

There will be no increase in flare capacity requirements or in actual flaring rates compared to historical operations as a petroleum refinery; therefore the PTE will not increase post-project. In fact, flaring at the facility is expected to be reduced due to the reduction in overall production rates from 120,000 bbl/day of petroleum products to 67,000 bbl/day of renewable products, the processing of lower volatility materials, and the shutdown of large process units that would typically rely on and contribute to flaring, such as the Crude Unit and its preheater (S-350, S-351), Vacuum Tower Feed Heater (S-36), U215-Gasoline Fractionating Unit (S-319), Sulfur Pits (S-301 through S-303), and the Calcining Kilns (S-1 and S-2 at the Carbon Plant, Plant 21360).

#### *Gasoline Blending*

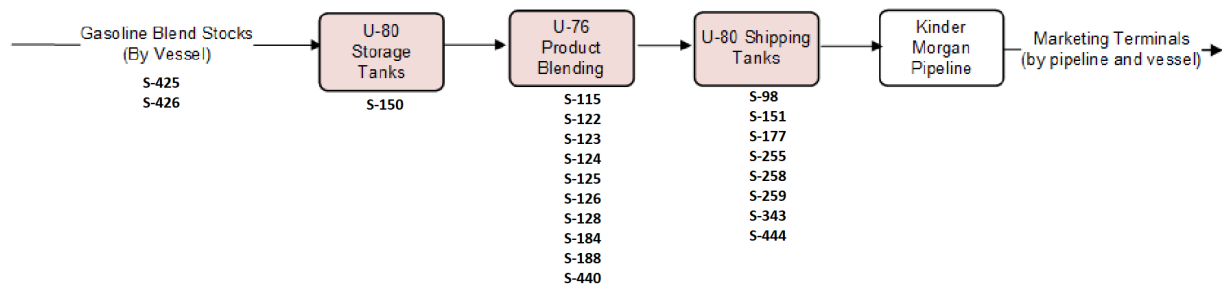
Gasoline blending operations will continue post-project, at Unit 76 Gasoline/Mid Barrel Blending Unit (S-318) and Unit 80 Refined Oil Shipping Unit (S-339). Post project, these blending operations will include renewable materials.

In addition to the change in materials at S-318, S-318 will also have a change in fugitive component counts. However, the corresponding emissions will decrease since there will be a net decrease in component counts. Since there will not be any physical changes to S-318, S-318 will be altered, and not modified.

Emissions from S-339 are solely from fugitive emissions from equipment leaks. Since there are no new or replacement components proposed for S-339, there will be no increase in fugitive emissions. Therefore, S-339 will be an altered, and not modified, source.

Tank 170 (S-125) currently stores petroleum-based naphtha and will be used to store renewable naphtha. Other than the marine terminal berths M1 and M2 (S-425 and S-426, respectively), S-125 is the only source in the figure below that will handle a new material. The handling of renewable naphtha constitutes a change in the method of operation. There are no increases in PTE for criteria pollutants, and the only increase in TAC PTE is for n-hexane. However, as discussed below, the TAC emissions are not subject to an HRA per Regulation 2-5-114. Therefore S-125 will be an altered, not modified source. The alteration status of S-425 and S-426 was discussed previously in the sections above.

All other sources listed in the figure below are storage tanks that will continue to store the same material, without any additional materials stored. S-188 is an exempt tank that will continue to store butane, and the other tanks below are permitted tanks that will continue to store gasoline. No changes are proposed for these storage tanks at Unit 76 (S-318) and Unit 80 (S-339).



**Figure 3 – Gasoline Blending Block Flow Diagram**

*Turbines and Duct Burners*

Phillips 66 has 3 permitted turbines (S-352 through S-354) and 3 associated duct burners (S-355 through S-357) to provide electricity and steam to the facility. All of these sources will remain operational. Post project, these sources may use renewable-based fuels as their combustion fuel. However, there will be no increased PTE due to the change in fuel, as shown in Appendix A. Therefore, the sources will be altered, not modified.

*Implementation Schedule*

This project will involve construction and demolition activities at this facility that will occur in phases over a period of approximately 21 months and are assumed to begin as early as the Authority to Construct for this application is issued. All demolition and construction will occur within this facility boundaries (except for one laydown area). The existing Phillips 66 Carbon Plant (Plant 21360) will also be demolished.

The following existing sources will be demolished or shut down after startup of the Rodeo Renewed Project. Condition 27646 requires Phillips 66 to submit a Device Data Update Form (Form DDU) within 90 days of startup of any source included in the Rodeo Renewed Project to ensure that all sources used for contemporaneous onsite emission reduction credits (CERCs) to offset emissions increase for this project are permanently shut down and their permits surrendered.

**Table 5: Sources to be demolished or shut down after startup of Rodeo Renewed Project**

Source/ Abatement No.	Source/Abatement Description	Status of Source	Condition # to be archived
S-29	U200 B-5 Heater	Shutdown	1694 (delete S-29 references only) 20989 (delete S-29 references only) 21235 (delete S-29 references only)
S-30	U200 B-101 Heater	Shutdown	1694 (delete S-30 references only) 20989 (delete S-30 references only) 21235 (delete S-30 references only)
S-36	Vacuum Tower Feed Heater U200, B-102 Heater	Shutdown	21097
S-109	Tank 154	Shutdown; demolished to make space for S-600 Pretreatment Unit	N/A

Source/ Abatement No.	Source/Abatement Description	Status of Source	Condition # to be archived
S-301	MOLTEN SULFUR PIT 234	Shutdown	22964 (delete S-301 references only)
S-302	MOLTEN SULFUR PIT 236	Shutdown	22964 (delete S-302 references only)
S-303	MOLTEN SULFUR PIT 238	Shutdown	22964 (delete S-303 references only)
S-350	U267_Crude Distillation Unit 267	Shutdown	383 1694 (delete S-350 references only)
S-351	U267_B-601/602 Tower Preheaters	Shutdown	1694 (delete S-351 references only) 20989 (delete S-351 references only) 21235 (delete S-351 references only)
S-439	Tank (T109)	Shutdown	12124
S-442	TK 112 (U244 Reformate)	Shutdown; demolished to make space for S-600 Pretreatment Unit	12127
S-1002	Sulfur Plant - Unit 236	Shutdown	19278 25963
S-1003	Sulfur Plant Unit 238	Shutdown	19278 25963
S-1	Calcining Kiln #1 (Plant 21360)	Shutdown	136
S-2	Calcining Kiln #2 (Plant 21360)	Shutdown	136 3752
S-5	Storage and Elevators (Plant 21360)	Shutdown	10438 10439
S-6	Rail and Truck Loadout (Plant 21360)	Shutdown	17539
S-7	Stockpile Fugitives (Plant 21360)	Shutdown	17540
S-22	Crossover Conveyor (Plant 21360)	Shutdown	10438 10439
S-23	Portable Conveyor (Plant 21360)	Shutdown	17540
S-25	Coke Pulverizer (Plant 21360)	Shutdown	N/A
S-30	Portable Conveyor (Plant 21360)	Shutdown	17540
S-31	Portable Conveyor (Plant 21360)	Shutdown	17540
S-41	K1 Sodium Carbonate Silo-bicarbonate (Plant 21360)	Shutdown	17820
S-42	K2 Sodium Carbonate Silo – carbonate (Plant 21360)	Shutdown	17820
S-43	K1 Sorbent Storage Silo – bicarbonate (Plant 21360)	Shutdown	26772
S-44	K2 Sorbent Storage Silo – bicarbonate (Plant 21360)	Shutdown	26772

The additional sources listed below will continue to be operational but are not included in this engineering evaluation. The Air District has determined that these sources are not part of the Rodeo Renewed Project, as no physical, operational, or permit condition changes will be made to these sources as a result of this project. Permit

Condition 27646 prohibits the processing of renewable materials at these sources and requires the facility to submit a permit application to request Air District authorization to do so.

**Table 6: Sources that will remain operational and are not included in Application 31157**

Source/ Abatement No.	Source/Abatement Description	Requested Permit Action	Permit Exemption (if applicable)	Status of Source
S-98	TANK NO. 101	None	NA	Will be operational; not included in engineering evaluation
S-100	TANK NO. 103	None	NA	Will be operational; not included in engineering evaluation
S-107	TANK NO. 150	None	NA	Will be operational; not included in engineering evaluation
S-115	TANK NO. 160	None	NA	Will be operational; not included in engineering evaluation
S-123	TANK NO. 168	None	NA	Will be operational; not included in engineering evaluation
S-124	TANK NO. 169	None	NA	Will be operational; not included in engineering evaluation
S-128	TANK NO. 174	None	NA	Will be operational; not included in engineering evaluation
S-129	TANK #180	None	NA	Will be operational; not included in engineering evaluation
S-134	API Waste Oil Tank T-194	None	NA	Will be operational; not included in engineering evaluation
S-136	TANK #201	None	2-1-123.3.2	Will be operational; not included in engineering evaluation
S-138	TANK NO. 203	None	2-1-123.3.2	Will be operational; not included in engineering evaluation
S-149	TANK NO.232	None		Will be operational; not included in engineering evaluation
S-151	TANK NO. 242	None		Will be operational; not included in engineering evaluation
S-168	TANK NO. 269	None		Will be operational; not included in engineering evaluation
S-169	TANK NO. 270	None	2-1-123.3.2	Will be operational; not included in engineering evaluation

Source/ Abatement No.	Source/Abatement Description	Requested Permit Action	Permit Exemption (if applicable)	Status of Source
S-171	Tank #273	None	2-1-123.3.6	Will be operational; not included in engineering evaluation
S-177	TANK NO. 287	None		Will be operational; not included in engineering evaluation
S-178	TANK NO. 288	None		Will be operational; not included in engineering evaluation
S-180	TANK #292	None	2-1-123.3.2	Will be operational; not included in engineering evaluation
S-182	Tank 294	None		Will be operational; not included in engineering evaluation
S-183	TANK NO. 295	None		Will be operational; not included in engineering evaluation
S-184	Tank #296	None		Will be operational; not included in engineering evaluation
S-186	TANK NO. 298	None		Will be operational; not included in engineering evaluation
S-191	TANK #303	None	2-1-123.3.3	Will be operational; not included in engineering evaluation
S-192	TANK NO. 304	None	2-1-123.3.3	Will be operational; not included in engineering evaluation
S-194	TANK NO. 306	None		Will be operational; not included in engineering evaluation
S-209	TANK NO. 674	None	2.1.123.3.2	Will be operational; not included in engineering evaluation
S-239	TANK 212, STRIPPED FOUL WATER	None		Will be operational; not included in engineering evaluation
S-255	TANK NO. 1002	None		Will be operational; not included in engineering evaluation
S-258	Tank No. 1005	None		Will be operational; not included in engineering evaluation
S-259	TANK NO. 1006	None		Will be operational; not included in engineering evaluation



Source/ Abatement No.	Source/Abatement Description	Requested Permit Action	Permit Exemption (if applicable)	Status of Source
S-286	TANK NO. F3 (DGA)	None	2-1-123.3.3	Will be operational; not included in engineering evaluation
S-287	TANK NO. F10	None	2-1-123.3.4	Will be operational; not included in engineering evaluation
S-289	TANK NO. F20	None		Will be operational; not included in engineering evaluation
S-293	TANK NO. F805 (DGA)	None	2-1-123.3.3	Will be operational; not included in engineering evaluation
S-343	TANK #210	None		Will be operational; not included in engineering evaluation
S-427	Marine Terminal Berth B2	None	2-1-123.2 2-1-123.3	Will be operational; not included in engineering evaluation
S-428	Marine Terminal Berth B3	None	2-1-123.2 2-1-123.3	Will be operational; not included in engineering evaluation
S-429	Marine Terminal Berth B4	None	2-1-123.2 2-1-123.3	Will be operational; not included in engineering evaluation
S-440	Tank 110 (Alkylate), 161,000 bbls	None		Will be operational; not included in engineering evaluation
S-444	Tank 243 (LAR Blendstock)	None		Will be operational; not included in engineering evaluation
S-446	Tank 310 (ISOPENTANE)	None		Will be operational; not included in engineering evaluation
S-447	Tank 311 (Isopentane)	None		Will be operational; not included in engineering evaluation
S-507	Unit 76 Active Skimmer System 450 gal fix roof tank #27	None		Will be operational; not included in engineering evaluation

The following sources will be idled upon startup of the Rodeo Renewed Project. Phillips 66 will retain the permits for these sources. However, a permit condition will be imposed to require Phillips 66 to notify the Air District if any of these idled sources are to return to service or if there are any proposed changes that were not previously permitted for these sources. Upon notification and prior to operation of any of the sources above in renewable-based service,, Phillips 66 shall submit a permit application for review and approval.

**Table 7: Sources to be idled upon startup of Rodeo Renewed Project and are not included in Application 31157**

Source/ Abatement No.*	Source/Abatement Description	Requested Permit Action	Permit Exemption (if applicable)	Status of Source
S-2	U229_B-301 HEATER	None	NA	Will be idled; not included in engineering evaluation
S-3	U230_B-201 HEATER	None	NA	Will be idled; not included in engineering evaluation
S-4	U231 B-101 Heater	None	NA	Will be idled; not included in engineering evaluation
S-5	U231 B-102 Heater	None	NA	Will be idled; not included in engineering evaluation
S-7	U231_B-103 HEATER	None	NA	Will be idled; not included in engineering evaluation
S-9	U240_B-2 BOILER	None	NA	Will be idled; not included in engineering evaluation
S-10	U240_B-101 HEATER	None	NA	Will be idled; not included in engineering evaluation
S-15	U244_B-501 HEATER	None	NA	Will be idled; not included in engineering evaluation
S-16	U244_B-502 HEATER	None	NA	Will be idled; not included in engineering evaluation
S-17	U244_B-503 HEATER	None	NA	Will be idled; not included in engineering evaluation
S-18	U244_B-504 HEATER	None	NA	Will be idled; not included in engineering evaluation
S-19	U244_B-505 HEATER	None	NA	Will be idled; not included in engineering evaluation
S-20	U244_B-506 HEATER	None	NA	Will be idled; not included in engineering evaluation
S-21	U244_B-507 HEATER	None	NA	Will be idled; not included in engineering evaluation
S-31	U200 B-501 Heater	None	NA	Will be idled; not included in engineering evaluation
S-43	U200 B-202 Heater	None	NA	Will be idled; not included in engineering evaluation

Source/ Abatement No.*	Source/Abatement Description	Requested Permit Action	Permit Exemption (if applicable)	Status of Source
S-44	U200_B-201 PCT Reboil Furnace	None	NA	Will be idled; not included in engineering evaluation
S-133	API Waste Oil Tank T-193	None	NA	Will be idled; not included in engineering evaluation
S-300	Delayed Coker U200 unit (formerly Crude Unit/ Delayed Coker U200 unit)	None	NA	Will be idled; not included in engineering evaluation
S-304	Naptha Hydrotreater	None	NA	Will be idled; not included in engineering evaluation
S-305	U230_PREFRACTIONATOR / NAPHTHA HYDROTREATER	None	NA	Will be idled; not included in engineering evaluation
S-306	U231_PLATFORMING UNIT 231	None	NA	Will be idled; not included in engineering evaluation
S-308	U244_REFORMING UNIT 244	None	NA	Will be idled; not included in engineering evaluation
S-319	U215_GASOLINE FRACTIONATING UNIT	None	NA	Will be idled; not included in engineering evaluation
S-336	U231 B-104 Heater	None	NA	Will be idled; not included in engineering evaluation
S-337	U231 B-105 Heater	None	NA	Will be idled; not included in engineering evaluation
S-370	U228_Isomerization Unit	None	NA	Will be idled; not included in engineering evaluation
S-371	U228_B-520 Furnace (Adsorber Feed)	None	NA	Will be idled; not included in engineering evaluation
S-372	U228_B-521 Furnace (H2 Plant)	None	NA	Will be idled; not included in engineering evaluation
S-432	U215_Deisobutanizer	None	NA	Will be idled; not included in engineering evaluation
S-433	MOSC Storage Tank	None	NA	Will be idled; not included in engineering evaluation
S-435	Reformate Splitter	None	NA	Will be idled; not included in engineering evaluation

Source/ Abatement No.*	Source/Abatement Description	Requested Permit Action	Permit Exemption (if applicable)	Status of Source
S-436	Deisopentanizer	None	NA	Will be idled; not included in engineering evaluation
S-452	U230 Cooling Tower	None	2-1-128.4	Will be idled; not included in engineering evaluation
S-457	U228 Cooling Tower	None	2-1-128.4	Will be idled; not included in engineering evaluation
S-458	U200 Cooling Tower	None	2-1-128.4	Will be idled; not included in engineering evaluation
S-462	Fuel Gas Caustic Treating Unit - Unit 215	None	NA	Will be idled; not included in engineering evaluation
S-463	Butane Caustic Treatment System	None	NA	Will be idled; not included in engineering evaluation

## **2.0 Emissions Calculation**

### ***2.1 - Feedstock Receiving***

Phillips 66 is proposing to receive feedstocks as well as finished petroleum products at Marine Terminal Berths M1 and M2 (S-425 and S-426, respectively) and receive feedstocks via pipeline, by trucks at existing Truck Unloading Operation (now assigned S-617, as described below), or by rail at the repurposed Rail Butane Loading Rack (S-70) since S-70 will no longer be used for butane unloading.

#### **Source S-70 (Rail Renewable Feedstock Unloading Rack)**

S-70 will have no increased PTE. Receiving (unloading) emissions are either fugitive emissions or are attributed to feedstock storage tanks. Furthermore, there are no toxic air contaminants associated with renewable feedstocks, so there will be no TAC emissions at S-70 post-project. S-70 is currently exempt from permitting under Regulation 2-1-123.3.1, storage or loading of liquified gases and will also be exempt under Regulations 2-1-123.3.2 (IBP > 302 °F) and 2-1-123.3.6, storage of tallow or vegetable oils, post-project. The source description will change from "Rail Butane Loading Rack" to "Rail Renewable Feedstock Unloading Rack." S-70 meets the requirements of Regulation 2-1-319, including the 5 tons/yr backstop provision in Regulation 2-1-319.1 (for the total source PTE, which includes the emissions from the source itself and the emissions from fugitive components) and the Regulation 2-1-319.2 requirement to meet Section 2-1-316, 317, or 318, as demonstrated in Appendix D.

**Table 2.1.1 – Pre-Project and Post-Project Fugitive Component Emissions for S-70 (Appendix D)**

Source No.	Source Description	Pre-Project POC Emissions		Post-Project POC Emissions		POC Emissions Increase	
		Daily (lbs/day)	Annual (tons/year)	Daily (lbs/day)	Annual (tons/year)	Daily (lbs/day)	Annual (tons/year)
S-70 (fugitive) [exempt per 2-1-123.2, (IBP > 302 °F), and 2-1-123.6, storage of tallow or vegetable oils]	Rail Renewable Feedstock Unloading Rack	2.8	0.514	4.4	0.801	1.6	0.287

*Renewable Feedstock (S-617 Truck Unloading Operation)*

Renewable feedstock will be unloaded at existing Truck Unloading Operation, which does not currently have an Air District-assigned source number and will be given S-617. Source S-617 is an exempt source and will continue to meet exemption requirements per Regulation 2-1-123.3.2, storage of organic liquids with an initial boiling point that is greater than 302F and exceeds storage temperature by at least 180°F and Regulation 2-1-123.3.6, storage or loading of liquid soaps, liquid detergents, tallow, or vegetable oils, waxes, or wax emulsions, and will also meet the backstop provisions in Regulation 2-1-319 as required under this exemption, including the 5 tons/yr backstop provision in Regulation 2-1-319.1 and the Regulation 2-1-319.2 requirement to meet Section 2-1-316, 317, or 318, as demonstrated in the tank emissions calculations in Appendix C. POC emissions from unloading would be accounted for at the respective storage tanks; therefore, there is no increase in PTE at S-617. There are no increases in fugitive component counts and no replacement components associated with S-617. Emissions associated with vehicle road dust are as follows, demonstrating that emissions are below 5 tons/year and therefore eligible for permit exemption per 2-1-123.3.2. There are no TAC emissions expected at on-site roads to and from S-617.

**Table 2.1.2 – Fugitive Road Dust Emissions for S-617 (Appendix L)**

Description	Pre-Project or Post-Project?	PM <sub>10</sub>	PM <sub>2.5</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
		(tons/year)	(tons/year)	(lbs/day)	(lbs/day)
Truck Unloading Fugitive Road Dust Emissions for S-617 [exempt per 2-1-123.3.2]	Pre-Project	0.007	0.002	0.038	0.010
	Post-Project	0.093	0.023	0.510	0.127

Sources S-425 and S-426 (Marine Terminal Berths M1 and M2)

S-425 and S-426 are used for both feedstock receiving (unloading) and product loading operations. Feedstock receiving operations are discussed here. Product and feedstock loading operations are discussed in Section 2.8 below.

Phillips 66 is proposing to receive (unload) feedstocks as well as finished petroleum products at Marine Terminal Berths M1 and M2 (S-425 and S-426, respectively). Emissions from receiving (unloading) of materials are attributed to storage tanks holding the materials. Therefore, the only process emissions attributed to S-425 and S-426 are from the loading of products and feedstocks, which are shown in Table 2.8.1 of Section 2.8 below.

**2.2 Feedstock Storage**

Renewable feedstocks will be stored in the existing storage tanks. Throughput and/or emission limits for altered sources are based on pre-project levels. These throughput/emission limits are from the historical highest daily and annual emissions for each altered tank, and are being established to ensure that these tanks remain altered, and not modified, and to provide operational flexibility (the ability to store both petroleum-based and renewable-based materials). Only one storage tank, S-139, will be altered. Its PTE will not increase post-project because it will be limited to its existing throughput and PTE. Though S-139 will retain its existing throughput and PTE, its projected emissions from the storage of renewable feedstocks are expected to decrease as shown in Table 2.2.1 because the vapor pressures associated with renewable feedstocks are lower than for petroleum feedstocks.

**Table 2.2.1 – Feedstock Storage Tank Emissions (Appendix C, Tables C-1, C-2, C-3, and C-4)**

Source No.	Description	Pre-Project		Post-Project assuming renewable service only		Pre-Project (to be imposed as enforceable permit condition limits)		Post-Project assuming renewable service only (estimated by Phillips 66, but not imposed as enforceable permit condition limits to account for operational flexibility)	
		Throughput (bbl/day)	Throughput (bbl/year)	Throughput (average) (bbl/day)	Throughput (bbl/year)	POC Emissions (lb/day)	POC Emissions (tons/year)	POC Emissions (average) (lb/day)	POC Emissions (tons/year)
S-139* [altered]	Tank 204, FRT, Naphtha, Distillate Oil, Gas Oil, Renewable Feedstock (pretreated), renewable-based slop oil	35,145	962,972	2638	962,972	49	3.206	8.92	1.628

\* All vapors from S-139 will continue to be routed to S-338 U233 Fuel Gas Center via A-7 Vapor Recovery System. Tanks that are controlled by A-7 are fixed-roof tanks which meet the requirements in Reg 8-5-301 for tanks with emission control systems and are required via permit conditions to achieve at least 95% overall abatement efficiency, which requires annual source testing at the heaters that utilize fuel gas. S-139 is operated at a slight pressure above atmospheric pressure using a natural gas blanket to maintain the pressure. As the tank level rises, vapors are pushed out of the tank and conveyed by a closed vent system to the A-7 compressors and then onto the fuel gas system. As the tank level goes down, natural gas is added to the tank to maintain the pressure in the tank. Natural gas is added or gas is removed from the vapor space, as needed, to maintain the slight pressure in the tank.

\*\* Grandfathered tanks; Pre-project daily and annual throughputs are based on historical highest throughputs, and are imposed as enforceable permit condition limits. The pre-project emissions presented above are for the sole purpose of demonstrating that there will not be an increase in emissions post-project. Future applications will need to be reviewed per Regulation 2-1-234.1.2 to determine the PTE in the post-Rodeo Renewed configuration.

For the existing feedstock storage tanks that will be exempt post-project, the emissions calculations are shown in Appendix C. As described in the Background section above, the exempt feedstock tanks are: S-90 (currently exempt), S-97, S-108 (currently exempt), S-110, S-111, S-112, S-113, S-114, S-135, S-173, S-174, S-175, S-204 (currently exempt), S-205 (currently exempt), S-334, S-340, S-445, S-449, and S-32120 (currently exempt). The exempt feedstock storage tanks will comply with the backstop provision in Regulation 2-1-319, including the 5 tons/yr backstop provision in Regulation 2-1-319.1 and the Regulation 2-1-319.2 requirement to meet Section 2-1-316, 317, or 318, as demonstrated in Appendix C. Additionally, Appendix C, Table C-3 shows that emissions of TACs will not exceed the trigger levels outlined in Regulation 2, Rule 5, Table 2-5-1.

**2.3 Pretreatment Unit (PTU) and Material Handling**

The proposed Pretreatment Unit (S-600) consists of three trains, all of which are abated first by the Biofilter (either A-622 or A-624, which are in parallel) and then the Carbon Adsorption System (either A-623 or A-625, which are also in parallel). Each of these carbon adsorption systems (A-623 and A-625) have two activated carbon vessels arranged in parallel at all times. The only potential emissions from S-600 are the abated total organic compound (TOC) emissions at the outlets of A-623 and A-625 and the fugitive TOC emissions from equipment leaks. Daily monitoring of TOC per Condition #27649 by a flame ionization detector (FID) or gas chromatography (GC) analyzer will help enforce the permitted emissions limits. For the purpose of the permit condition, TOC is considered to be equal to precursor organic compounds (POC) and non-methane organic compounds (NMOC).

It is expected there will be no TAC emissions related to processes at S-600, and testing will confirm this. No TACs are specified in the SDS (Safety Data Sheet) provided for each proposed feedstock (including beef tallow, used cooking oil, and soybean oil) and processing materials (including bleaching earth (diatomaceous earth) and filter aid). Permit conditions will be imposed to require an SDS to be maintained for each feedstock and processing

material and periodic lab testing to demonstrate that there are no TACs present in any streams associated with S-600, including raw feedstocks entering S-600 and pretreated feedstocks after processing at S-600.

All vapors from S-600 and its associated equipment (S-605 through S-616 and S-618) will be routed to the aforementioned Biofilters (either A-622 or A-624) and Carbon Adsorption Systems (either A-623 or A-625), as each of the three trains will be closed-loop systems and will not vent to the atmosphere. As mentioned in the Background section, all of these abatement devices will be subject to monitoring. Therefore, any potential emissions from the associated equipment are included in the emissions shown below for S-600. Emissions calculations are based on an outlet POC concentration of 10 ppmv, which is imposed as an enforceable permit condition limit.

**Table 2.3.1 – Emissions for S-600 (Appendix D and Appendix G)**

Source No.	Source Description	Post-Project		Post-Project POC Emissions		Reference
		Throughput (bbl/day)	Throughput (bbl/year)	Daily (lb/day)	Annual (tons/year)	
S-600 (includes emissions from S-605 through S-616 and S-618)	Pretreatment Unit (PTU) (at outlet of both A-623 and A-625 Activated Carbon Vessels combined)	80,000	29,200,000	2.6	0.478	Appendix G
	Fugitive Emissions	N/A	N/A	44.68	8.154	Appendix D, Tables D-2 and D-3.13

S-607 through S-611 and S-618 are unabated storage tanks at S-600 that store virgin process materials. As shown in Table 2.3.2 below, the only organic emissions from these tanks is at S-611, and POC emissions are expected to be minimal (2.5 lb/yr); therefore, these tanks are not required to be controlled for the purposes of both Regulations 2-2 and 8-5, with the exception of Regulation 8-5-307.3 (pressure vacuum valves). S-607 and S-618 are exempt from permitting pursuant to 2-1-123.2.1, Sulfuric acid with an acid strength of more than 99.0% by weight. S-608 through S-610 are exempt from permitting pursuant to Regulation 2-1-123.2, Tanks, vessels and pumping equipment used exclusively for the storage or dispensing of any aqueous solution which contains less than 1 percent (wt) organic compounds. S-611 is exempt from permitting pursuant to 2-1-123.3.3, storage or loading of petroleum oils with an ASTM D-93 (PMCC) flash point of 130°F or higher, when stored or loaded at a temperature at least 36°F below the flash point.

As shown in Appendix C, the sulfuric acid emissions from S-607, which are the only TAC emissions from these tanks, are below the respective Regulation 2-5 thresholds. The emissions below demonstrate that the Regulation 2-1-319.1 5 TPY backstop provision is met.

**Table 2.3.2 – PTU Uncontrolled Storage Tank Emissions**

Source No.	Description	Post-Project		POC Emissions		Reference
		Throughput (gal/day)	Throughput (gal/year)	Daily (lb/day)	Annual (tons/year)	
S-607 [exempt per 2-1-123.2.1, Sulfuric acid with an acid strength of more than 99.0% by weight]	Sulfuric Acid Tank (at S-600 Pretreatment Unit), 400 gallons	400	45,000	0	0	Appendix C

Source No.	Description	Post-Project		POC Emissions		Reference
		Throughput (gal/day)	Throughput (gal/year)	Daily (lb/day)	Annual (tons/year)	
S-608 [exempt per 2-1-123.3.2 , storage of organic liquids with an initial boiling point greater than 302F and exceeds storage temperature by at least 180°F]	Citric Acid Tank (at S-600 Pretreatment Unit), 16,100 gallons	16,100	1,811,250	0	0	Per the National Institute of Health's (NIH) PubChem online database, citric acid has a vapor pressure of 1.7E-8 mmHg at ambient conditions (25 C). This is an extraordinarily low vapor pressure that will generate negligible emissions from this tank.
S-609 [exempt per 2-1-123.2 storage or dispensing of any aqueous solution which contains less than 1 percent (wt) organic compounds]	Sodium Hydroxide Tank (at S-600 Pretreatment Unit), 5160 gallons	5160	580,500	0	0	Per the National Institute of Health's (NIH) PubChem online database, sodium hydroxide (caustic) has a negligible vapor pressure at ambient conditions (25 C) and will thus generate negligible emissions of the compound.
S-610 [exempt per 2-1-123.2]	Coagulant Tank (at S-600 Pretreatment Unit), 400 gallons	400	45,000	0	0	Per the National Institute of Health's (NIH) PubChem online



Source No.	Description	Post-Project		POC Emissions		Reference
		Throughput (gal/day)	Throughput (gal/year)	Daily (lb/day)	Annual (tons/year)	
						database, sodium hydroxide (caustic) has a negligible vapor pressure at ambient conditions (25 C) and will thus generate negligible emissions of the compound.
S-611 [exempt per 2-1-123.3.3]	Polymer Tank (at S-600 Pretreatment Unit), 400 gallons	400	45,000	0.01	0.001	Appendix C
S-618	Sulfuric Acid Tank (at S-600 Pretreatment Unit), 400 gallons	400	45,000	0	0	Appendix C

Particulate matter (PM) emissions from the associated PTU Wet Surface Air Cooler (S-614) are also expected due to the total dissolved solids (TDS) expected to be present in the recirculating water. S-614 is exempt per Regulation 2-1-128.4, Cooling towers not used for evaporative cooling of process water. Phillips 66 plans to use municipal water (clean water) for cooling the process water; therefore, POC emissions are not expected to be present. The process water is contained within tubes and is not in direct contact with the municipal cooling water. For S-614, municipal water is used as cooling water, and municipal cooling water by itself is not expected to have any emissions of organics. The facility will be required via Condition #27660 to conduct quarterly monitoring/recording of total hydrocarbon concentration at the recirculation line to ensure no leakage of process water occurs and that the aforementioned exemption is satisfied.

**Table 2.3.3 – PM Emissions for S-614 (Appendix G)**

Source No.	Source Description	PM <sub>10</sub> /PM <sub>2.5</sub> Emissions (lbs)	
		Daily	Annual
S-614 [exempt Regulation 2-1-128.4 – Water cooling towers not used for evaporative cooling of process water]	PTU Wet Surface Air Cooler (WSAC)	0.6	200

Silos and Day Hoppers (S-601 through S-605)

Emissions of PM and crystalline silica, a TAC, will be generated during transfer of bleached earth and filter aid from delivery trucks to silos and from silos to day hoppers. Each transfer point is completely enclosed and controlled by a baghouse. The baghouses abating S-601 and S-602 will be required to achieve an outlet grain loading of 0.0015 gr/dscf PM<sub>10</sub>, and the baghouses abating S-603 through S-605 will be required to achieve an outlet grain loading of 0.002 gr/dscf PM<sub>10</sub>. Per the SDS, bleached earth has a clay-like texture and has a moisture content greater than or equal to 5 percent weight. Therefore, the sources that handle bleached earth are exempt per Regulation 2-1-115.1.4.4 (for S-601 Silos) and 2-1-115.1.4.5 (for S-604 Hoppers) as described below. The emissions shown below demonstrate that the 5 tons/year backstop in Regulation 2-1-319.1 is met for the exempt sources.

**Table 2.3.4 – Silo and Day Hopper Emissions (Appendix H)**

Source Type	Source #	Material	Post-Project		Criteria Air Pollutant Emissions	
			Throughput	Throughput	PM <sub>10</sub> /PM <sub>2.5</sub> Emission Rate	
			lbs/day	tons/year	lbs/day	tons/year
Silos	S-601 Bleaching Earth Storage Silos (12), each abated by A-627 through A-638 Pulse Jet Dust Houses (12) [exempt per 2-1-115.1.4.4, loading/unloading material with moisture content greater than or equal to 5% wt .]	Bleached Earth	295,918	54,005	5.9	1.1
	S-602 Filter Aid Storage Silos (9) and Truck Loading/Traffic, each abated by A-606 through A-614 Pulse Jet Dust Houses (9)	Filter Aid	158,016	28,838	4.4	0.81
Day Hoppers	S-604 Bleaching Earth Adsorption Day Hoppers (6), each abated by A-639 through A-644 Dust Filters (6) [exempt per 2-1-115.1.4.5, loading/unloading material with moisture content greater than or equal to 5% wt.]	Bleached Earth	295,918	54,005	1.6	0.3
	S-603 Polyethylene Removal Filter Aid Day Hoppers (4) and Truck Loadout/Traffic, abated by A-615 and A-618 Dust Filters (4)	Filter Aid	90,288	16,479	1.1	0.2
	S-605 Filter Aid Adsorption Day Hoppers (3) and Truck Loadout Traffic, abated by A-619 and A-621 Dust Filters (3)	Filter Aid	67,728	12,359	0.8	0.15

Since S-602, S-603, and S-605 are included in the HRA for this application, the TAC emissions estimates for these sources are presented below.

**Table 2.3.5 – TAC Emissions for S-602, S-603, and S-605 (Appendix H)**

Source #	Material	Toxic Air Contaminant Emissions	
		Crystalline Silica Emission Rate	
		Hourly (lbs/hour)	Annual (lbs/year)
S-602 Filter Aid Storage Silos (9) and Truck Loading/Traffic, each abated by A-606 through A-614 Pulse Jet Dust Houses (9)	Filter Aid	0.093	811
S-603 Polyethylene Removal Filter Aid Day Hoppers (4) and Truck Loadout/Traffic, abated by A-615 and A-618 Dust Filters (4)	Filter Aid	0.0228	200
S-605 Filter Aid Adsorption Day Hoppers (3) and Truck Loadout Traffic, abated by A-619 and A-621 Dust Filters (3)	Filter Aid	0.0171	150

*Truck loading/traffic emissions at S-600 Pretreatment Unit*

The following emissions calculations are the fugitive road dust emissions associated with the loading of fresh filter aid into S-602. There are no TAC emissions expected at on-site roads to and from S-600 and its associated sources.

**Table 2.3.6 – Fugitive Road Dust Emissions for S-602 (Appendix L)**

Source	Source Description	Delivery Truck Trips	PM <sub>10</sub> Emissions		PM <sub>2.5</sub> Emissions	
		(trips/year)	Daily (lb/day)	Annual (tons/year)	Daily (lb/day)	Annual (tons/year)
S-602 (fugitive)	Truck Loading fugitive road dust emissions within facility boundary	6428	0.462	0.0825	0.1155	0.0206

The following emissions calculations are the fugitive road dust emissions associated with loadout of the spent filter aid cake materials and waste products.

**Table 2.3.7 – Fugitive Road Dust Emissions for S-603 and S-605 (Appendix L)**

Source	Source Description	Delivery Truck Trips	PM <sub>10</sub> Emissions		PM <sub>2.5</sub> Emissions	
		(trips/year)	Daily (lb/day)	Annual (tons/year)	Daily (lb/day)	Annual (tons/year)
S-603 and S-605 (fugitive)	PTU Material Truck Loadout fugitive road dust emissions within facility boundary	9038	0.667	0.116	0.167	0.029

The emissions shown in the tables above and the corresponding maximum number of daily and annual truck trips are included as enforceable permit condition limits (Condition #27650 for S-602 and Condition #27651 for S-603 and S-605).

**2.4 Process Units with Only Fugitive Emissions (S-307, S-318, S-322, S-434, and S-437) and Associated Combustion Devices (S-11, S-12, S-13, S-22, S-45, and S-438)**

Potential emissions from the sources below are all fugitive POC from equipment leaks since all of these sources are closed systems. The table below shows that the project will result in fugitive emission increases for these sources, except S-318. However, as explained in the Background section, these sources are considered altered sources, with the exception of S-307 and S-434, which are modified sources. All new and replaced fugitive components will be exempt per Regulation 2-1-128.21 but will be subject to BACT and offsets per Regulation 2-1-128.21.5. The post-project emissions shown below are included as enforceable permit condition limits, under Condition #27658.

Sources S-307, S-318, S-322, and S-434 were determined to be exempt from an HRA per Regulation 2-5-114 (Limited Exemption). Although these sources are modified sources of TACs per the definition in Regulation 2-5-214, there is no increase in toxicity-weighted emissions above pre-project emissions levels, thereby satisfying the exemption in Regulation 2-5-114, as shown in Appendix J.

**Table 2.4.1 – POC Emissions for S-307, S-318, S-322, S-434, and S-437 (Appendix D)**

Source No.	Source Description	Pre-Project POC Emissions		Post-Project POC Emissions		POC Emissions Increase	
		Daily (lb/day)	Annual (tons/year)	Daily (lb/day)	Annual (tons/year)	Daily (lb/day)	Annual (tons/year)
S-322 (fugitive) [altered]	Unit 40 Raw Materials Receiving	27.3	4.973	28.3	5.167	1.1	0.193
S-318 (fugitive) [altered]	Unit 76	37.6	6.853	37.5	6.847	-0.1	-0.007
S-437 (fugitive) [altered]	Unit 110 Hydrogen Manufacturing Unit	8.8	1.597	9.0	1.641	0.2	0.043
S-307 (fugitive) [modified]	U240 UNICRACKING UNIT 240	52.0	9.494	56.6	10.327	4.6	0.834
S-434 (fugitive) [modified]	U246 High Pressure Reactor Train	20.7	3.773	23.2	4.241	2.6	0.468

Since S-437 is included in the HRA for this application, the post-project TAC emissions estimates for S-437 are presented below.

**Table 2.4.2 – TAC Emissions for S-437 (Appendix D)**

S-437 Unit 110 Hydrogen Manufacturing Unit TAC Emissions (fugitive)		
TAC	Hourly (lb/hr)	Annual (lb/year)
Benzene	3.74E-05	0.33
1,3-Butadiene	2.95E-05	0.26
Ethylbenzene	1.56E-06	0.01
n-Hexane	2.17E-03	18.98
Hydrogen sulfide	2.90E-05	0.25

<b>S-437 Unit 110 Hydrogen Manufacturing Unit TAC Emissions (fugitive)</b>		
<b>TAC</b>	<b>Hourly (lb/hr)</b>	<b>Annual (lb/year)</b>
Naphthalene	3.46E-07	0.00
Propylene	5.47E-03	47.88
Toluene	4.11E-05	0.36
Xylene (mixed isomers)	6.58E-05	0.58

The emissions from S-11, S-12, S-13, S-45, and S-438 are shown below. There are no physical changes to these heaters, and their PTE will not increase; therefore, these heaters are altered sources. To ensure that these heaters are altered and not modified sources and to provide operational flexibility, permit conditions will limit the daily and annual fuel usage and emissions for these heaters to their existing pre-project fuel usage and emissions limits. As described in Appendix B, the production of renewable fuels will result in a new fuel gas combusted in these heaters. This new fuel gas will have a similar or lower heat content on a volumetric basis (Btu/scf) and less sulfur due to changes in facility operations. Per Appendix B, Tables B-2, B-3, B-3, B-5 and B-6, emissions of TACs will not increase post-project for these heaters. The post-project projected emissions for S-11, S-12, S-13, and S-45 are also presented below to demonstrate that emissions reductions are expected from the usage of the new fuel gas at these heaters. The post-project emissions for S-438 are based on permitted levels from Application #11293. For greenhouse gas emissions, please refer to Appendix B.

**Table 2.4.3 – Criteria Pollutant Emissions for S-11 (Appendix B)**

<b>S-11 U240 B-201 Heater</b>	<b>Pre-Project Emissions* (Maximum Capacity: 108 MMBtu/hr)</b>		<b>Post-Project Emissions Estimate not used as a basis for permit conditions (Estimated at 33 MMBtu/hr)</b>	
	<b>Daily (lb/day)</b>	<b>Annual (tons/year)</b>	<b>Daily (lb/day)</b>	<b>Annual (tons/year)</b>
PM <sub>10</sub>	12.50	2.28	5.4	0.98
PM <sub>2.5</sub>	12.50	2.28	5.4	0.98
NO <sub>x</sub>	127.27	23.23	37.5	6.846
CO	735.97	134.31	1.3	0.231
SO <sub>2</sub>	215.47	21.45	44	8.025
POC	9.05	1.65	3.9	0.709

\* The pre-project emissions presented above are for the sole purpose of demonstrating that there will not be an increase in emissions post-project. These calculations are not used to establish permit condition limits. Furthermore, due to the exothermic nature of this process, combustion rates and consequently emissions are expected to be less than pre-project maximum levels. Future applications will need to be reviewed per Regulation 2-1-234.1.2 to determine the PTE in the post-Rodeo Renewed configuration.

**Table 2.4.4 – Criteria Pollutant Emissions for S-12 (Appendix B)**

S-12 U240 B-202 Heater	Pre-Project Emissions* (Maximum Capacity: 42 MMBtu/hr)		Post-Project Emissions Estimate not used as a basis for permit conditions (Estimated at 24 MMBtu/hr)	
	Pollutant	Daily (lb/day)	Annual (tons/year)	Daily (lb/day)
PM <sub>10</sub>	4.86	0.89	3.9	0.34
PM <sub>2.5</sub>	4.86	0.89	3.9	0.34
NO <sub>x</sub>	24.39	4.45	15.4	4.3
CO	286.21	52.23	3.5	2.6
SO <sub>2</sub>	83.79	8.34	31.7	2.7
POC	3.52	0.64	2.8	0.24

\* The pre-project emissions presented above are for the sole purpose of demonstrating that there will not be an increase in emissions post-project. These calculations are not used to establish permit condition limits. Furthermore, due to the exothermic nature of this process, combustion rates and consequently emissions are expected to be less than pre-project maximum levels. Future applications will need to be reviewed per Regulation 2-1-234.1.2 to determine the PTE in the post-Rodeo Renewed configuration.

**Table 2.4.5 – Criteria Pollutant Emissions for S-13 (Appendix B)**

S-13 U240 B-301 Heater	Pre-Project Emissions* (Maximum Capacity: 194 MMBtu/hr)		Post-Project Emissions Estimate not used as a basis for permit conditions (Estimated at 93 MMBtu/hr)	
	Pollutant	Daily (lb/day)	Annual (tons/year)	Daily (lb/day)
PM <sub>10</sub>	22.45	4.10	15	2.743
PM <sub>2.5</sub>	22.45	4.10	15	2.743
NO <sub>x</sub>	69.84	12.75	28.4	5.185
CO	1,322.02	241.27	3.6	0.651
SO <sub>2</sub>	387.05	38.53	123	22.451
POC	16.25	2.97	10.9	1.985

\* Pre-Project emissions for NO<sub>x</sub> are from Condition #1694. Other than for NO<sub>x</sub>, the pre-project emissions presented above are for the sole purpose of demonstrating that there will not be an increase in emissions post-project. These calculations are not used to establish permit condition limits. Furthermore, due to the exothermic nature of this process, combustion rates and consequently emissions are expected to be less than pre-project maximum levels. Future applications will need to be reviewed per Regulation 2-1-234.1.2 to determine the PTE in the post-Rodeo Renewed configuration.

**Table 2.4.6 – Criteria Pollutant Emissions for S-45 (Appendix B)**

S-45 U246 B-801 A/B Heater	Pre-Project Emissions* (Maximum Capacity: 85 MMBtu/hr)		Post-Project Emissions Estimate not used as a basis for permit conditions (Estimated at 24 MMBtu/hr)	
	Pollutant	Daily (lb/day)	Annual (tons/year)	Daily (lb/day)
PM <sub>10</sub>	10.41	1.90	1.7	0.31
PM <sub>2.5</sub>	10.41	1.90	1.7	0.31
NO <sub>x</sub>	12.60	2.30	2.9	0.52
CO	15.34	2.80	1.7	0.32
SO <sub>2</sub>	25.75	4.70	0.3	0.046
POC	8.22	1.50	0.5	0.1

\* Pre-Project emissions are from Condition #22962. Furthermore, due to the exothermic nature of this process, combustion rates and consequently emissions are expected to be less than pre-project maximum levels. Future applications will need to be reviewed per Regulation 2-1-234.1.2 to determine the PTE in the post-Rodeo Renewed configuration.

**Table 2.4.7 – Criteria Pollutant Emissions for S-438 (Appendix B)**

S-438 U110 H-1 Furnace	Pre-Project Emissions* (Maximum Capacity: 250 MMBtu/hr)		Post-Project Emissions (Based on 250 MMBtu/hr)	
	Pollutant	Daily (lb/day)	Annual (tons/year)	Daily (lb/day)
PM <sub>10</sub>	24.00	4.380	24.00	4.380
PM <sub>2.5</sub>	24.00	4.380	24.00	4.380
NO <sub>x</sub>	49.80	9.089	49.80	9.089
CO	138.00	25.185	138.00	25.185
SO <sub>2</sub>	9.60	1.752	9.60	1.752
POC	13.80	2.519	13.80	2.519

\* The pre-project emissions are from Application #11293, which are equal to post-project emissions. Future applications will need to be reviewed per Regulation 2-1-234.1.2 to determine the PTE in the post-Rodeo Renewed configuration.

**2.5 Renewable Jet Isomerization Unit (S-309)**

Emissions from the Unit 248 Renewable Jet Isomerization Unit (S-309) are all fugitive precursor organic compounds from equipment leaks. There are no new or replacement fugitive components proposed at S-309. the daily permitted throughput limit of 16,740 bbl/day (Permit Condition #27647) will not change. Thus, changes to S-309 will not result in an increased PTE, and S-309 is an altered, and not modified source. Per Appendix D, emissions of TAC do not exceed the trigger levels outlined in Regulation 2, Rule 5, Table 2-5-1.

**Table 2.5.1 – POC Emissions for S-309 (Appendix D)**

Source No.	Description	Pre-Project		Post-Project	
		POC Emissions (lb/day)	POC Emissions (tons/year)	POC Emissions (lb/day)	POC Emissions (tons/year)
S-309 (fugitive) [altered]	Unit 248 Renewable Jet Isomerization Unit (formerly U248_UNISAR UNIT 248)	7	1.276	7	1.276

The emissions from U248 B-606 Heater (S-22) are shown below. There are no physical changes at S-22, and its PTE will not increase; therefore, S-22 is an altered source. To ensure that S-22 is an altered and not modified source and to provide operational flexibility, permit conditions are imposed to limit the daily and annual fuel usage and emissions for S-22 to its existing pre-project fuel usage and emissions limits. As described in Appendix B, the production of renewable fuels will result in a new fuel gas combusted in S-22. This new fuel gas will have a similar or lower heat content on a volumetric basis (Btu/scf) and less sulfur due to changes in facility operations. Per Appendix B, Table B-5, emissions of TACs will not increase post-project. The post-project projected emissions for S-22 (from Appendix B of the CEQA DEIR) are presented below to demonstrate that emissions reductions are expected from the usage of the new fuel gas at S-22.

**Table 2.5.2 – Criteria Pollutant Emissions for S-22 (Appendix B)**

S-22 U248 B-606 Heater	Pre-Project Emissions* (Maximum Capacity: 31 MMBtu/hr)		Post-Project Emissions (Estimated at 13 MMBtu/hr) Estimate not used as a basis for permit conditions	
	Daily (lb/day)	Annual (tons/year)	Daily (lb/day)	Annual (tons/year)
PM <sub>10</sub>	3.59	0.65	2	0.367
PM <sub>2.5</sub>	3.59	0.65	2	0.367
NO <sub>x</sub>	18.15	3.31	8	1.467
CO	211.25	38.55	2.6	0.467
SO <sub>2</sub>	61.85	6.16	16.2	2.949
POC	2.60	0.47	1.5	0.265

\* The pre-project emissions presented above are for the sole purpose of demonstrating that there will not be an increase in emissions post-project. These calculations are not used to establish permit condition limits. Furthermore, due to the exothermic nature of this process, combustion rates and consequently emissions are expected to be less than pre-project maximum levels. Future applications will need to be reviewed per Regulation 2-1-234.1.2 to determine the PTE in the post-Rodeo Renewed configuration.

**2.6 Total Project Emissions from Fugitive Components**

The total project cumulative increase (per Regulation 2-2-608) from equipment leaks (i.e., fugitive emissions) is based on the total count of new and replacement fugitive components proposed for the Rodeo Renewed Project. These emissions differ from the fugitive emissions increases presented in the previous tables, which compared the pre- and post-project Potential to Emit for POC for each source and showed the net increase in emissions from equipment leaks resulting from the net increase in component counts. For the purposes of HRA applicability, post-project total TAC emissions for each source are compared against that source’s pre-project levels per Regulation 2-5.



Permit Condition #27658, Part 11 contains limits on fugitive component counts and annual POC emissions from all new and replacement components installed as part of the Rodeo Renewed Project. Permit Condition #27658, Part 13 requires Phillips 66 to submit within 30 days of completion of installation of the project’s fugitive components the final component counts for each source in order for the Air District to adjust the aforementioned permit condition limits and charge/refund offsets accordingly.

The post-project fugitive component counts and corresponding annual POC emissions associated with each of sources listed in the table below are also included as permit condition limits. These POC emissions limits function as limits on the actual emissions for each source determined using Leak Detection and Repair measurements (LDAR). For any future projects to install additional fugitive components above the existing permitted component counts and/or above the corresponding POC emission limit for a given source, the facility must submit a permit application in order to determine whether such emissions increases would qualify for the fugitive components exemption in Regulation 2-1-128.1, qualify for a temporary permit under the Accelerated Permitting Program, or would constitute a modification per New Source Review (Regulation 2-2) and/or Toxics New Source Review (Regulation 2-5) (which would necessitate an HRA). To reduce administrative burden, Phillips 66 may submit a single, combined permit application on an annual basis that includes all such projects that have occurred during the previous year.

**Table 2.6.1 – POC Emissions from New and Replacement Fugitive Components for Entire Project (Appendix D)**

Source No.	Description	POC Emissions (lb/day)	POC Emissions (tons/year)
S-307 S-318 S-322 S-434 S-437 S-599 S-600	New and Replacement Fugitive Components for Entire Project	57.1	10.421

For applications that involve multiple sources, the Air District groups the component counts, including all new and replaced components, in order to check if BACT and/or offsets are triggered. This grouped approach helps to confirm that adequate offsets have been provided for the changes through the use of the LDAR program. The Air District has also created both emissions limits and limits on the counts per source/process unit that correspond with assumptions made within the application. These source/process unit limits will help to confirm ongoing compliance with Regulation 2-5.

**2.7 Renewable Fuels Storage**

Renewable products will be stored in the existing storage tanks. To ensure that the tanks below (other than the tanks that are exempt) will be altered, and not modified, sources and to provide operational flexibility, permit conditions are imposed to limit the daily and annual throughputs and emissions for the given tank to its existing pre-project throughput and emissions limits. The post-project throughputs and emissions for altered sources (from Appendix C) assuming renewable service only are presented below to demonstrate that emissions reductions are expected from the storage of renewable feedstocks, as the vapor pressures associated with renewable feedstocks are lower than for petroleum feedstocks.

For the product storage tanks that will be exempt post-project, the emissions calculations are shown in Appendix C. As described in the Background section above, these exempt tanks are: S-99, S-103, S-105, S-127, S-261, S-262, S-263, and S-448.

S-99, S-103, S-105, S-127, S-262, and S-263 are currently exempt and will continue to meet the exemption requirements pursuant to Regulation 2-1-123.3.2, storage of organic liquids with an initial boiling point that is greater than 302F and exceeds storage temperature by at least 180°F, and will also meet the backstop provisions in Regulation 2-1-319 as required under this exemption, including the 5 tons/yr backstop provision in Regulation 2-1-319.1 and the Regulation 2-1-319.2 requirement to meet Section 2-1-316, 317, or 318, as demonstrated in Appendix C.

S-254, S-256, S-257, S-261, S-341, S-342, and S-448 are currently permitted to store a variety of petroleum-based fuels. Phillips 66 is proposing to repurpose these tanks to store renewable diesel and renewable jet and maintain the ability to store petroleum-based fuels. The proposed changes will not result in an increased PTE; therefore, these tanks will be altered sources.

**Table 2.7.1 – Renewable Diesel/Renewable Jet Storage Tank Emissions (Appendix C)**

Source No.	Description	Pre-Project used as basis for proposed limits***		Post-Project assuming renewable service only		Pre-Project used as basis for proposed limits***		Post-Project assuming renewable service only Estimate not used as a basis for permit conditions	
		Throughput (bbl/day)	Throughput (bbl/year)	Throughput (average) (bbl/day)	Throughput (bbl/year)	POC Emissions (lb/day)	POC Emissions (tons/year)	POC Emissions (average) (lb/day)	POC Emissions (tons/year)
S-254* [altered]	Tank 1001, EFRT, Gasoline – Unleaded, Renewable Diesel, Renewable Jet	138,362	7,257,233	19,8836	7,257,233	21	2.040	1.42	0.259
S-256* [altered]	Tank 1003, EFRT, Diesel, Naphtha, Distillate, Gasoline – Unleaded, Renewable Diesel, Renewable Jet	111,383	4,024,700	11,027	4,024,700	20	0.303	0.87	0.158
S-257* [altered]	Tank 1004, IFRT, Diesel, Naphtha, Gasoline – Unleaded, Renewable Diesel, Renewable Jet	42,438	3,568,973	9778	3,568,973	6	0.178	0.70	0.127
S-341** [altered]	Tank 208, EFRT, Refinery Feedstock, Gasoline – Unleaded, Renewable Diesel, Renewable Jet	12,000	1,819,583	4985	1,819,583	7.6	1.380	0.44	0.079
S-342** [altered]	Tank 209, EFRT, Jet A Fuel, Gasoline – Unleaded, Renewable Diesel, Renewable Jet	12,000	2,407,700	4985	2,407,700	2.2	0.394	0.57	0.104

\* Grandfathered tanks; Pre-project daily and annual throughputs are based on historical highest throughputs, and are imposed as enforceable permit condition limits.

\*\* Pre-Project throughputs and emissions are from Application 27954 (Clean Fuels Expansion Project). These throughputs and emissions are imposed as explicit enforceable permit condition limits under this current application.

\*\*\* Throughput and/or emission limits for altered sources are based on pre-project levels. These throughput/emission limits are from the historical highest daily and annual emissions for each altered tank, and are being established to ensure that these tanks remain altered and not modified. The pre-project emissions presented above are for the sole purpose of demonstrating that there will not be an increase in emissions post-project. Future applications will need to be reviewed per Regulation 2-1-234.1.2 to determine the PTE in the post-Rodeo Renewed configuration.

S-188, S-189, S-190, and S-253 are spherical high-pressure storage tanks. Per AP-42, Chapter 7, high-pressure tanks are considered closed systems, with virtually no emissions while fugitive losses from high-pressure tanks are estimated as equipment leaks. Emissions from equipment leaks are expected to be minimal and these tanks are monitored under the Fugitives Program. There are no direct emissions from these pressurized tanks. The sources above are currently exempt from permitting and will continue to meet the exemption requirements pursuant to Regulation 2-1-123.3.1, storage of liquefied gases. They will also meet the backstop provisions in Regulation 2-1-319 as required under this exemption, including the 5 tons/yr backstop provision in Regulation 2-1-319.1 and the Regulation 2-1-319.2 requirement to meet Section 2-1-316, 317, or 318, as demonstrated above.

**Table 2.7.2 – Butane Storage Tank Emissions**

Source No.	Description	Pre-Project		Post-Project	
		POC Emissions (lbs/day)	POC Emissions (tons/year)	POC Emissions (lbs/day)	POC Emissions (tons/year)
S-188 [exempt per 2-1-123.3.1]	Tank 300, sphere, Paraffins - C3+, Butane, Renewable Butane	0	0	0	0
S-189 [exempt per 2-1-123.3.1]	Tank 301, sphere, Paraffins - C3+, Butane, Renewable Butane	0	0	0	0
S-190 [exempt per 2-1-123.3.1]	Tank 302, sphere, Paraffins - C3+, Butane, Renewable Butane	0	0	0	0
S-253 [exempt per 2-1-123.3.1]	Tank 833, sphere, Paraffins - C3+, Butane, Renewable Butane	0	0	0	0

For the product storage tanks that will be exempt post-project, the emissions calculations are shown in Appendix C. As described in the Background section above, these exempt tanks are: S-99, S-103, S-105, S-127, S-261, S-262, S-263, and S-448. Appendix C demonstrates that post-project emissions are below the 5 tons/year backstop in Regulation 2-1-319.1 and the Regulation 2-1-319.2 requirement to meet Section 2-1-316, 317, or 318, as demonstrated in Appendix C.

S-122, S-125, S-126, and S-150 will store renewable naphtha post-project, and S-139 and S-140 will store renewable-based slop oil, which may contain residual renewable naphtha. The post-project emissions of POC and TACs (other than for n-hexane) are expected to be less than pre-project. The switch from petroleum naphtha to renewable naphtha results in an increase in n-hexane emissions post-project. However, Appendix J shows that the post-project TAC emissions from storage of renewable naphtha line at these tanks do not exceed the trigger levels listed in Table 2-5-1 of Regulation 2-5, and the post-project toxicity weighted emissions are less than the baseline toxicity weighted emissions such that the exemption under Regulation 2-5-114 applies.

**Table 2.7.3 – Gasoline and Naphtha (Petroleum and Renewable) Storage Tank Emissions (Appendix C)**

Source No.	Description	Pre-Project used as basis for proposed limits***		Post-Project assuming renewable service only		Pre-Project used as basis for proposed limits***		Post-Project assuming renewable service only Estimate not used as a basis for permit conditions	
		Throughput (bbl/day)	Throughput (bbl/year)	Throughput (average) (bbl/day)	Throughput (bbl/year)	POC Emissions (lb/day)	POC Emissions (tons/year)	POC Emissions (average) (lb/day)	POC Emissions (tons/year)
S-122 [altered]	Tank 167, EFRT, Naphtha, Refinery Feedstock, Renewable Naphtha	5479	2,000,000	5479	2,000,000	22	4.095	10.18	1.858
S-125**** [altered]	Tank 170, EFRT, Naphtha, Renewable Naphtha	29,918	3,000,000	8219	3,000,000	10	1.782	9.76	1.782
S-126** [altered]	Tank 172, IFRT, Naphtha, Refinery Feedstock, Renewable Naphtha	28,800	594,845	1630	594,845	9.2	1.682	2.16	0.394
S-139 [altered]	Tank 204, FRT, Naphtha, Distillate Oil, Gas Oil, Renewable Feedstock (pretreated), renewable-based slop oil	35,145	962,972	2638	962,972	49	3.206	8.92	1.628
S-140 [altered]	Tank 205, FRT, Naphtha, renewable-based slop oil	56,107	630,575	1728	630,575	94	2.623	14.37	2.623
S-150 [altered]	Tank 241, EFRT, Gasoline – Unleaded, Renewable Naphtha	31,655	519,471	1423	519,471	15	1.813	9.72	1.775

All vapors from these sources will continue to be routed to S-338 U233 Fuel Gas Center via A-7 Vapor Recovery System. Tanks that are controlled by A-7 are fixed roof tanks which meet the requirements in Reg 8-5-301 for tanks with emission control systems and are required via permit conditions to achieve at least 98% overall abatement efficiency, which requires annual source testing at the heaters that utilize fuel gas. These tanks are operated at a slight pressure above atmospheric pressure using a natural gas blanket to maintain the pressure. As the tank level rises, vapors are pushed out of the tank and conveyed by a closed vent system to the A7 compressors and then onto the fuel gas system. As the tank level goes down, natural gas is added to the tank to maintain the pressure in the tank. Natural gas is added or gas is removed from the vapor space, as needed, to maintain the slight pressure in the tank.

\*\* Pre-Project throughputs and emissions are from Application 27954 (Clean Fuels Expansion Project).

\*\*\* Throughput and/or emission limits for altered sources are based on pre-project levels. These throughput/emission limits are from the historical highest daily and annual emissions for each altered tank, and are being established to ensure that these tanks remain altered and not modified. The pre-project emissions presented above are for the sole purpose of demonstrating that there will not be an increase in emissions post-project. Future applications will need to be reviewed per Regulation 2-1-234.1.2 to determine the PTE in the post-Rodeo Renewed configuration.

\*\*\*\* Annual throughput limit imposed as enforceable permit condition is based on 3,000,000 bbl/yr per Phillips 66’s request. This limit is less than the annual throughput (of 6,687,105 bbl/yr) corresponding to the historical highest annual emissions. Daily throughput limit is based on historical highest daily emissions.

POC emissions from the sludge storage tank (S-195) are shown below. There are no physical changes to S-195 and no increase in PTE; therefore, S-195 is an altered, and not modified, source.

**Table 2.7.4 – Sludge Storage Tank Emissions (Appendix C, Tables C-1, C-2, and C-3)**

Source No.	Description	Pre-Project		Post-Project assuming renewable service only		Pre-Project		Post-Project assuming renewable service only Estimate not used as a basis for permit conditions	
		Throughput (bbl/day)	Throughput (bbl/year)	Throughput (average) (bbl/day)	Throughput (bbl/year)	POC Emissions (lb/day)	POC Emissions (tons/year)	POC Emissions (average) (lb/day)	POC Emissions (tons/year)
S-195 [altered]	Tank 501, FRT, Sludge	711	97,928	268	97,928	9	0.956	5.24	0.956

## **2.8 Finished Product and Renewable Feedstock Loading and Distribution**

### Sources S-425 and S-426 (Marine Terminal Berths M1 and M2)

No physical changes are proposed at S-425 and S-426. Loading operations are currently abated by a Thermal Oxidizer (A-420) for gasoline loading. A-420 will continue to abate S-425 and S-426 when loading regulated organic materials. Because there are no physical changes to the marine terminal itself, daily loading will not increase or change. The amount of material loaded will not increase because there is no physical change being made to increase that capacity.

Phillips 66 is proposing to unload an average of 25,000 bpd of renewable feedstocks and maintain the same gasoline receiving capacity to receive an average of 25,000 bpd of gasoline. Gas oil will not be loaded at S-425 and S-426 post-project. Post-project, Phillips 66 will load naphtha and renewable diesel at S-425 and S-426, and will retain the ability to load gasoline. Finished petroleum products will not be processed at the facility. S-425 and S-426 combined are currently permitted to transfer 51,182 barrels of crude oil and/or gas oil and 25,000 barrels of gasoline in any calendar day (bpd) (Permit Condition #4336, Part 7). S-425 and S-426 will not load crude oil in the future.

To ensure that the PTE for S-425 and S-426 will not increase post-project while providing operational flexibility, permit conditions will be imposed to limit the daily and annual emissions for each/combined S-425 and S-426 to their existing pre-project emissions limits rather than the post-project emissions levels shown below. Nonetheless, as shown in Table 2.8.1 below, emission reductions are expected based on loading renewable feedstocks, as the vapor pressures associated with renewable feedstocks are lower than for petroleum feedstocks. Because no physical changes are proposed at S-425 and S-426, there will be no increase in equipment fugitive leak emissions.

There will not be an increase in POC and TAC emissions from the loading of gasoline at S-425 and S-426 since the existing throughput limit of 25,000 bbl/day in Permit Condition 4336 Part 6a will remain unchanged post-project.

Since there are no physical changes and the post-project POC PTE will not increase above pre-project levels, S-425 and S-426 are altered sources. Marine cargo carrier emissions are not included when evaluating whether a marine loading operation is altered or modified. Thus, the marine cargo carrier emissions increases are shown in Table 2.8.2 below for information purposes only. Pre-project and post-project emissions are shown in Appendices E and O. The pre-project emissions are based on attainable throughputs (actual historical highest emissions, as provided in Appendix E).

**Table 2.8.1 – Pre-Project and Post-Project Loading and Fugitive Emissions and Throughput limits for each/combined S-425/S-426 (Appendices D and E)**

Material Type	Throughput (bbl/day – Max)	Throughput (bbl/day - Avg.)	Throughput (bbl/year)	Throughput (Mgal/year)	Emissions (lb/day)	Emissions (tons/year)
<b>Post-Project</b>						
Renewable Diesel	145,400	67,000	24,455,000	1,027,110	34.3	2.881
Renewable Feedstocks	113,100	25,000	9,125,000	383,250	1.1	0.044
Gasoline	145,400	25,000	9,125,000	383,250	164.9	5.174
Fugitive Emissions	N/A	N/A	N/A	N/A	31.2	5.7
TOTAL (process emissions)					<b>200.2</b>	<b>8.099</b>
TOTAL (fugitive emissions)					<b>31.2</b>	<b>5.7</b>
<b>Pre-Project (Petroleum-Based Mode)</b>						
Gas Oil	87,040	6,190	2,259,350	94,893	325.8	4.229
Diesel	138,446	18,677	6,817,157	286,321	32.6	0.803
Gasoline	95,936	25,000	9,125,000	383,250	108.8	5.174
Fugitive Emissions	N/A	N/A	N/A	N/A	68.8	12.5
TOTAL (process emissions- petroleum-based)					<b>467.3</b>	<b>10.206</b>
TOTAL (fugitive emissions- petroleum-based mode)					<b>31.2</b>	<b>5.7</b>
<b>Pre-Project (Renewable-Based Mode)</b>						
Gas Oil	87,040	6,190	2,259,350	94,893	325.8	4.229
Renewable Diesel	138,446	15,000	5,475,000	229,950	32.6	0.645
Gasoline	95,936	25,000	9,125,000	383,250	108.8	5.174
TOTAL (process emissions- renewable-based mode)					<b>467.3</b>	<b>10.048</b>
TOTAL (fugitive emissions- renewable-based mode)					<b>31.2</b>	<b>5.7</b>
<b>Post-Project Minus Worst-Case Pre-Project* (process and fugitive emissions combined)</b>					<b>-267.0</b>	<b>-2.1</b>

\* As shown above, the worst-case pre-project PTE is from the facility's operation in petroleum-based mode. The pre-project emissions presented above are for the sole purpose of demonstrating that there will not be an increase in emissions post-project. Future applications will need to be reviewed per Regulation 2-1-234.1.2 to determine the PTE in the post-Rodeo Renewed configuration.

**Table 2.8.2 – Pre-Project and Post-Project Annual Emissions for S-425/S-426 (each and combined)**

		POC (tons/year)	SO <sub>2</sub> (tons/year)	NO <sub>x</sub> (tons/year)	CO (tons/year)	PM <sub>10</sub> (tons/year)	PM <sub>2.5</sub> (tons/year)	Reference
Pre-Project	Marine Cargo Carrier	8.706	6.336	136.698	44.748	3.898	3.629	Appendix O
	Material Loading*	10.91	0.000	0.000	0.000	0.000	0.000	Appendix E
	<b>Total Emissions</b>	<b>19.607</b>	<b>6.336</b>	<b>136.698</b>	<b>44.748</b>	<b>3.898</b>	<b>3.629</b>	-
	<b>Pre-Project PTE**</b>	<b>10.91</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	-
Post-Project	Marine Cargo Carrier*	16.240	11.006	265.967	87.292	7.067	6.574	Appendix O
	Material Loading*	8.09	0.000	0.000	0.000	0.000	0.000	Appendix E
	<b>Total Emissions</b>	<b>24.33</b>	<b>11.006</b>	<b>265.967</b>	<b>87.292</b>	<b>7.067</b>	<b>6.574</b>	-
	<b>Post-Project PTE**</b>	<b>8.09</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	-

\* See loading emissions estimates in Table 2.1.2 above







**2.10 Sour Water Strippers and Amine Gas Treatment (S-599), abated by Unit 237 Sulfur Treatment Unit (2 Trains), consisting of: Train #1: A-598 Thermal Oxidizer and A-599 SO<sub>2</sub> Scrubber and Train #2: A-600 Thermal Oxidizer and A-601 SO<sub>2</sub> Scrubber**

NO<sub>x</sub>, SO<sub>2</sub>, and PM emission rates are based on Phillips 66's engineering design, and annual source testing will be required to demonstrate compliance with these emissions. As mentioned in the Background section, NO<sub>x</sub> and SO<sub>2</sub> CEMS will also be required to be installed and operated at S-599. POC, CO, and CO<sub>2</sub> emissions are calculated based on combustion emission factors from AP-42 Chapter 1, Section 4 "Natural Gas Combustion" Tables 1.4-1 and 1.4-2. The greenhouse gas emissions for S-599 are shown in Appendix I. As shown above, Permit Condition #27648 will limit the combined emissions from both stacks of S-599 to 1.3 times the annual emissions from each individual stack. This will reduce the cumulative increase for offsetting purposes. Both the individual stack and combined stack emissions are included as enforceable permit condition limits.

**Table 2.10.1 – S-599 Sour Water Strippers and Amine Gas Treatment Criteria Pollutant Emissions (Appendix I and Appendix D)**

Pollutant	Emissions for Each Stack		Combined Emissions from 2 stacks		Fugitive	
	Daily (lb/day)	Annual (tons/year)	Daily (lb/day)	Annual* (tons/year)	Daily (lb/day)	Annual (tons/year)
POC	0.8	0.15	1.6	0.19	3.7	0.68
NO <sub>x</sub>	42.2	7.70	84.4	10.0	---	---
CO	15.2	2.78	30.5	3.62	---	---
SO <sub>2</sub>	19.4	3.53	38.7	4.59	---	---
PM <sub>2.5</sub> /PM <sub>10</sub> (as Sulfuric Acid Mist)	17.5	3.20	22.8	4.16	---	---

\* Permit Condition #27648 will limit the combined annual criteria pollutant emissions from both stacks to 1.3 times the annual emissions from each individual stack.

Permit Condition #27648 will limit PM<sub>10</sub>/PM<sub>2.5</sub> (as sulfuric acid mist) both stacks combined to Permit Condition #27648 4.16 tons/year. The permit condition limit from each stack is back-calculated as follows: (4.16 tons/year) ÷ 1.3 = 3.20 tons/year

**Table 2.10.2 – S-599 Sour Water Strippers and Amine Gas Treatment TAC Emissions (Appendix I, Table I-2 and Appendix D)**

Pollutant	TACs					
	Emissions from each stack		Emissions from 2 stacks		Fugitive	
	lb/hr	lb/year	lb/hr	lb/year	lb/hr	lb/year
Benzene	1.5E-05	1.3E-01	3.0E-05	2.6E-01	0	0
Formaldehyde	5.3E-04	4.6E+00	1.1E-03	9.3E+00	0	0
Toluene	2.4E-05	2.1E-01	4.8E-05	4.2E-01	0	0
Sulfuric Acid	0.731	6400	9.5E-01	8320	0	0
Hydrogen Sulfide	0.041	356	8.1E-02	711	4.34E-03	38
Ammonia	0.095	830	1.9E-01	1658	0	0

The following is the expected chemical composition profile of amine gas and sour water gas to be abated by U237 Sulfur Treatment Unit:

**Table 2.10.3 – S-599 Sour Water Strippers and Amine Gas Treatment Chemical Composition Profile**

Chemical	Vapor Mol%	
	Amine Gas	Sour Water Gas
H <sub>2</sub>	1.3	0
N <sub>2</sub>	0.002	0
CO	0.01	0
CO <sub>2</sub>	74.6	30
H <sub>2</sub> S	15.2	4
NH <sub>3</sub>	0.002	26
H <sub>2</sub> O	5.9	40
Methane	1.15	0
Ethane	0.3	0
Propane	1.4	0
Butane	0.1	0
Pentane	0.016	0
Hexane	0.025	0
Total	100	100

Phillips 66 will retain the permit for Unit 235 Sulfur Recovery System (S-1010), as well as Sulfur Degassing Unit (S-504) and S-505, which are upstream of S-1010). S-1010 will remain operational and will be used primarily as backup for the new sulfur treatment unit that is abating S-599 Sour Water Strippers and Amine Gas Treatment. S-1010 will be used as necessary during planned and unplanned outages of the thermal oxidizers and/or scrubbers at the new sulfur treatment unit. Consequently, the associated equipment Unit 235 Sulfur Pit Tank (S-465), Sulfur Storage Tank (S-503, which is located within Unit 235), and Sulfur Degassing Unit (S-504), will remain operational and the permits for this equipment will be retained. Since S-465, S-503, and S-504 are currently and will continue to be abated by S-1010, the emissions from these sources are included in the emissions estimates for S-1010, which are shown below. As shown, there will be no increased PTE at S-1010 post-project.

**Table 2.10.4 – S-1010 Unit 235 Sulfur Recovery Unit Emissions (backup unit for S-599) (Appendix I)**

Pollutant	Pre-Project Emissions (does not include S-599)*		Post-Project Emissions*	
	Daily (lb/day)	Annual (tons/year)	Daily (lb/day)	Annual (tons/year)
PM <sub>10</sub>	9.5	1.19	9.5	1.19
PM <sub>2.5</sub>	9.5	1.19	9.5	1.19
Combined NO <sub>x</sub> emissions from S-599 (U237) and S-1010 (U235), S-465, S-503, and S-504	61.3	11.2	61.3	10
CO	201	37.90	201	37.90
SO <sub>2</sub>	201	29.70	201	29.70
POC	2.3	0.43	2.3	0.43
<b>Greenhouse Gases</b>	<b>MT/day</b>	<b>MT/yr</b>	<b>MT/day</b>	<b>MT/yr</b>
CO <sub>2</sub> (NG combustion)	24.81	9,056.88	24.81	9,056.88
CH <sub>4</sub> (NG combustion)	0.0005	0.17	0.0005	0.17
N <sub>2</sub> O (NG combustion)	0.0000	0.02	0.0000	0.02
CO <sub>2</sub> (Sour gas content)	21.1886	7,733.83	21.1886	7,733.83
CO <sub>2</sub> e	46.03	16,799.59	46.03	16,799.59
<b>Toxic Air Contaminants</b>	<b>lb/day</b>	<b>lb/yr</b>	<b>lb/day</b>	<b>lb/yr</b>
Acetaldehyde	0.0062	2.28	0.0062	2.28
Ammonia	21.1200	7,700.00	21.1200	7,700.00
Benzene	0.0009	0.34	0.0009	0.34
Ethylbenzene	0.0005	0.18	0.0005	0.18
Formaldehyde	0.0334	12.20	0.0334	12.20
Hydrogen sulfide	5.5200	1,950.00	5.5200	1,950.00
Naphthalene	0.0005	0.18	0.0005	0.18
PAHs (as B[a]P equiv)	0.0000	0.00	0.0000	0.00
Propylene	0.1047	38.23	0.1047	38.23
Sulfuric acid	31.0000	11,315.00	31.0000	11,315.00
Toluene	0.0015	0.55	0.0015	0.55
Xylene (mixed isomers)	0.0064	2.33	0.0064	2.33

\* In addition to the aforementioned individual and combined stack emissions limits for S-599, Permit Condition #27648 will limit NO<sub>x</sub> emissions from both sulfur units (S-599 and S-1010 and S-1010's associated sources S-465, S-503, and S-504) combined to 10 tpy. All other emissions shown in the table above are from existing Condition #23125 and the corresponding Applications 13424 and 25621.

**2.11 Cooling Towers**

The throughputs shown below are based on Phillips 66's engineering design. Daily and annual throughputs are calculated assuming continuous operation. Percent drift values shown below are based on manufacturer guarantees. Condition 27660, Part 6 requires that Phillips 66 maintain written documentation from the vendor/manufacturer that specifies the guaranteed maximum drift rate of 0.001 % and the premise, basis, and justification for the drift rate for the two permitted cooling towers, S-453 and S-455.

While the facility will be retaining its pre-project throughput and emissions for S-453 and S-455, emissions reductions are expected from exclusively renewable service, as shown below. Because there will be no increased PTE from these cooling towers, they are altered, and not modified. Total dissolved solids (TDS) concentration

calculated using the 3-year historical maximum measured conductivity and 0.67, the default correlation factor to convert conductivity to TDS concentration from Equation 8-8 in "Emissions Estimation Protocol for Petroleum Refineries", Version 3, dated April 2015.

PM10 emissions are calculated using "Emissions Estimation Protocol for Petroleum Refineries", Version 3, date April 2015. PM10 emissions are conservatively set to equal PM2.5 emissions.

Maximum return POC factor is based on the limit listed in Table VII-CC.1 of the Title V Permit, which is from Regulation 11-10.204.1.

POC emissions are calculated using Equation 8-5 in "Emissions Estimation Protocol for Petroleum Refineries", Version 3, dated April 2015.

TAC emissions will not increase for any cooling towers below, so the pre- and post-project TAC emissions estimates are not presented below. Please refer to Appendix K for the TAC emissions estimates.

**Table 2.11.1 – Cooling Tower POC Emissions (Appendix K)**

Source #	Post-Project Throughput		Pre-Project POC Emissions** (to be imposed as enforceable permit condition limits)		Post-Project POC Emissions	
	(mmgal/day)	(mm gal/year)	(lbs/day)	(tons/year)	(lbs/day)	(tons/year)
S-453*	19.44	7095.6	13.62	2.49	1.37	0.25
S-455*	47.52	17,344.8	33.29	6.08	5.479	1
S-456 [exempt per 2-1-128.4, Cooling towers not used for evaporative cooling of process water]	Exempt source	Exempt source	0.76	0.14	0.225	0.041
S-500 [exempt per 2-1-128.4]	Exempt source	Exempt source	5.65	1.03	0.877	0.16

\* Grandfathered cooling towers; Pre-project daily and annual throughputs are based on engineering design and continuous operation, and are imposed as enforceable permit condition limits.

\*\* Throughput and/or emission limits for altered sources are based on pre-project levels. Future applications will need to be reviewed per Regulation 2-1-234.1.2 to determine the PTE in the post-Rodeo Renewed configuration.

**Table 2.11.2 – Cooling Tower PM<sub>10</sub>/PM<sub>2.5</sub> Emissions (Appendix K)**

Source #	Post-Project Throughput		Pre-Project PM <sub>10</sub> /PM <sub>2.5</sub> Emissions** (to be imposed as enforceable permit condition limits)		Post-Project PM <sub>10</sub> /PM <sub>2.5</sub> Emissions***	
	(mmgal/day)	(mm gal/year)	(lbs/day)***	(tons/year)***	(lbs/day)	(tons/year)
S-453*	19.44	7095.6	3.18	0.58	1.425	0.26
S-455*	47.52	17,344.8	8.11	1.48	4.712	0.86
S-456 [exempt per 2-1-128.4]	Exempt source	Exempt source	3.39	0.62	1.041	0.19
S-500 [exempt per 2-1-128.4]	Exempt source	Exempt source	0.67	0.12	0.438	0.08

\* Grandfathered cooling towers; Pre-project daily and annual throughputs are based on engineering design and continuous operation, and are imposed as enforceable permit condition limits

\*\* PM<sub>10</sub> = PM<sub>2.5</sub>

\*\*\* Throughput and/or emission limits for these altered sources are based on pre-project levels. Future applications will need to be reviewed per Regulation 2-1-234.1.2 to determine the PTE in the post-Rodeo Renewed configuration.

**2.12 Flares (C-1 Flare (S-296) and MP-30 Flare (S-398))**

There will be no increase in flare capacity requirements or in actual flaring rates compared to historical operations as a petroleum refinery. In fact, flaring at the facility is expected to be reduced due to the reduction in overall production rates from 120,000 bbl/day of petroleum products to 67,000 bbl/day of renewable products, the shutdown of large process units that would typically rely on and contribute to flaring, and the processing of lower volatility materials, such as the Crude Unit and its preheater (S-350, S-351), Vacuum Tower Feed Heater (S-36), U215-Gasoline Fractionating Unit (S-319), Sulfur Pits (S-301 through S-303), and the Calcining Kilns (S-1 and S-2 at the Carbon Plant, Plant 21360). Thus there will be no increased PTE at these sources.

**2.13 Turbines and Duct Burners**

As stated previously, there are no increases in emissions expected from the change in fuel, as shown in Appendix A, so there will be no increased PTE from S-352 through S-357. Therefore, the sources are considered to be altered, not modified.

Greenhouse gas and TAC emissions are provided in Appendix B.

**Table 2.13.1 – Criteria Pollutant Emissions for S-352 through S-357**

S-352 through S-357	Pre-Project Emissions*		Post-Project Emissions*		
	Daily (lb/day)	Annual (tons/year)	Daily (lb/day)	Annual (tons/year)	
PM <sub>10</sub>	120	19	120	19	App 30810
PM <sub>2.5</sub>	120	19	120	19	App 30810
NO <sub>x</sub>	1584	79.8	1584	79.8	App 13424 and Cond 12122, Part 9b
CO	1096	200	1096	200	Cond 12122 Part 10a
SO <sub>2</sub>	617	111	617	111	App 30810
POC	199	30.5	199	30.5	Part 11

\* The pre-project emissions (which are used for post-project) presented above are from Applications 13424 and 30810 and Condition #12122.

### 3.0 Cumulative Increase and Offsets

Pursuant to Regulation 2-2-302, federally enforceable emission offsets are required for POC and NO<sub>x</sub> emission increases from permitted sources at facilities that will emit 10 tons per year or more of those pollutants. For PM<sub>10</sub>, PM<sub>2.5</sub>, and SO<sub>2</sub>, offsets are required for facilities that will emit 100 tons per year or more of those pollutants pursuant to District Regulation 2-2-303. A facility may comply with the offset requirements by shutting down other sources or curtailing emissions at other sources to counterbalance new emissions from the proposed project. These reductions provide contemporaneous onsite emission reduction credits (CERCs). The shutdown or curtailment must have occurred within 5 years before the permit application for the proposed project or must occur by the time the proposed project begins operations (or for a replacement unit, by 90 days after the replacement unit begins operation). If the CERCs equal or exceed the cumulative increase for the proposed project, offsets will not be needed for that pollutant. Banked credits must be provided to offset any increases which are not counterbalanced by CERCs.

Table 3.1 summarizes the cumulative increase in emissions, and Table 3.2 shows the CERCs resulting from equipment shutdowns (as well as physical changes to S-97 which will reduce emissions). Table 3.2 also shows that for all pollutants besides POCs, CERCs are expected to exceed the cumulative increase in emissions from the project. Thus, banking credits are only required to offset POC emissions, as discussed in more detail below.

**Table 3.1 – Summary of Cumulative Increase\***

Source No.	Description	Source Category	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	POC	CO
			(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)
<b>New Sources</b>								
S-599	Sour Water Strippers and Amine Gas Treatment	Sulfur Treatment Unit 237 (STU)	4.160	4.160	10.000	4.592	0.189	3.616
		Fugitive					see below	
S-600	Pretreatment Unit (PTU) (at outlet of both A-623 and A-625 Activated Carbon Vessels combined)	Pretreatment Unit (PTU)					0.478	
		Fugitive					see below	
S-602	Filter Aid Storage Silos (9) and Truck Loading/Traffic, each abated by	Material Handling	0.811	0.811				
	Truck Loading Fugitive Road Dust Emissions	Fugitive	0.082	0.021				
S-603	Polyethylene Removal Filter Aid Day Hoppers (4), abated by A-615 and A-618 Dust Filters (4)	Material Handling	0.200	0.200				

Source No.	Description	Source Category	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	POC	CO
			(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)
<b>New Sources</b>								
	Truck Loadout Fugitive Road Dust Emissions	Fugitive	0.116	0.029				
S-605	Filter Aid Adsorption Day Hoppers (3), abated by	Material Handling	0.150	0.150				
	A-619 and A-621 Dust Filters (3)							
<b>Emissions Increases from Total Project Fugitive Emissions</b>								
S-307	U240 Unicracking Unit 240	Fugitive (from new and replaced fugitive components)					10.421	
S-318	Unit 76							
S-322	Unit 40 Raw Materials Receiving							
S-434	U246 High Pressure Reactor Train							
S-437	Unit 110 Hydrogen Manufacturing Unit							
S-599	Sour Water Strippers and Amine Gas Treatment							
S-600	Pretreatment Unit (PTU) (at outlet of both A-623 and A-625 Activated Carbon Vessels combined)							
<b>TOTAL</b>			<b>5.519</b>	<b>5.370</b>	<b>10.000</b>	<b>4.592</b>	<b>11.088</b>	<b>3.616</b>

\*The table does not include any previously un-offset emissions increases at this facility. However, both the project emissions increases and the previously un-offset emissions increases will be offset under this permit application

**Table 3.2 Contemporaneous Emission Reduction Credits (CERCs)**

Source No.	Description	Source Category	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	POC
			(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)
S-29	U200 B-5 Heater	Stationary Combustion	2.102	2.102	2.049	13.874	0.084

Source No.	Description	Source Category	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	POC
			(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)
S-30	U200 B-101 Heater	Stationary Combustion	0.919	0.919	0.897	6.061	0.037
S-36	U200 B-102 Heater	Stationary Combustion	1.090	1.090	1.207	2.338	0.310
S-97	Tank No. 100	Storage Tanks					1.043
S-350	U267 Crude Distillation Unit	Fugitives					0.074
S-351	U267 B-601/602 Tower Preheaters	Stationary Combustion	1.477	1.477	1.463	9.105	0.057
S-439	Tank No. 109	Storage Tanks					0.728
S-442	Tank No. 112	Storage Tanks					0.570
S-1002	U236 Sulfur Plant (including aux. burner, water stripper)	Sulfur Plants	1.948	1.948	3.355		0.030
S-1003	U238 Sulfur Plant (including aux. burner)	Sulfur Plants	1.819	1.819	2.689		0.031
S-1002	U236 Sulfur Plant (including aux. burner, water stripper)	Fugitives					0.019



Source No.	Description	Source Category	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	POC
			(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)
S-1003	U238 Sulfur Plant (including aux. burner)	Fugitives					0.010
<b>Estimated Contemporaneous Onsite and Offsite Emission Reduction Credits</b>			9.355	9.355	11.660	31.378	2.993
<b>Cumulative Increase</b>			5.519	5.370	10.000	4.592	11.088
<b>Estimated Excess Contemporaneous Onsite Emission Reduction Credits Remaining</b>			3.836	3.985	1.660	26.787	-8.095

The initial estimates of CERCs for all sources shown above have been verified by Air District staff. However, the actual CERCs shall be based on the future shutdown dates of S-29, S-30, S-36, S-350, S-351, S-439, S-442, S-1002 and/or S-1003, and on the future effective date of the completion of physical changes to S-97 (to install controls). Per Permit Condition #27646, the final CERCs will be adjusted based on the baseline period ending date when the emission reduction becomes enforceable (when the owner/operator relinquishes the source's permit), in accordance with Regulation 2-2-603.1 (Baseline period ending date).

CERCs are calculated in accordance with Regulation 2-2-605. The calculated emission reduction credits must be real, permanent, quantifiable, and in excess of any reductions required by applicable regulatory requirements. Detailed emissions calculations are provided in Appendix N.

Fugitive emissions are based on a three-year average (June 2018 to May 2021) of actual quarterly inspection readings as part of the facility's Leak Detection and Repair (LDAR) program and emissions are estimated using correlation equations developed by both the United States Environmental Protection Agency (EPA) and the California Air Pollution Control Officers Association (CAPCOA). For the purpose of calculating CERCs, net readings of 0 parts per million (ppm) mean a leak is not detected and is not credited, i.e., the default-zero emission factor is not used to estimate fugitive emissions. Furthermore, net readings greater than the leak threshold of 100 ppm established per RACT (Reasonably Available Control Technology) requirements for pumps/compressors and established in Regulation 8-18-301 for all other fugitive components have been adjusted down.

Storage tank emissions for S-439 and S-442 are based on a three-year average (June 2018 to May 2021) using emissions calculations from TankESP and the true vapor pressures of each tank (see Appendix C). As described above, S-97 will be physically changed from an external floating roof tank into a fixed-roof tank with a carbon adsorption system (A-626). These changes will reduce emissions from S-97. Therefore, the CERCs are calculated based on the difference between the three-year average emission baseline emissions and the post-project PTE of S-97 assuming the maximum vapor flow rate and 10 ppmv (the maximum concentration at the outlet of A-626) that is imposed as a permit condition limit (Permit Condition 25477).

Combustion emissions for S-29, S-30, S-36, and S-351 are based on a three-year average (June 2018 to May 2021) using average firing rates, total sulfur mass balances, actual emissions data from source test results, AP-42, and regulatory standards. The average firing rates for S-29, S-30, S-36, and S-351 are 76.7, 33.6, 45.2, and 54.8 MMBtu/hour, respectively.

Sulfur plant emissions (S-1002 and S-1003) are based on a three-year average (June 2018 to May 2021) using average firing rates, actual emissions data from source test results, and regulatory standards.. For SO<sub>2</sub>, since the Air District’s Compliance and Enforcement Division has deemed the Continuous Emissions Monitors (CEMS) for S-1002 and S-1003 "inoperative" with invalid data for the past 5 years, CERCs for SO<sub>2</sub> cannot be granted for S-1002 and S-1003.

**Table 3.3 – Air District Emission Factors for Contemporaneous Onsite Emission Reduction Credits for Combustion Sources (S-29, S-30, S-36, S-351) (Appendix N)**

Pollutant	Emission Factor	Reference
PM <sub>10</sub>	7.6 lb/MMscf	AP-42 Chapter 1.4-2
PM <sub>2.5</sub>		See Note 1
PM <sub>10</sub> (for S-36 only)	6.642 lb/MMscf	2005 Source Test for S-36 (OS-1217)
PM <sub>2.5</sub> (for S-36 only)		See Note 1
NO <sub>x</sub>	0.0061 lb/MMBtu	SJVUAPCD, Rule 4320
SO <sub>2</sub>	Various (see Appendix N)	Total daily sulfur fuel mass balance
POC	2.38E-04 lb/MMBtu	2017 Source Test for S-351 (FAT 119-17)
POC (for S-36 only)	1.89 lb/MMscf	2005 Source Test for S-36 (OS-1087)

Note 1: Emission factor for PM<sub>2.5</sub> is assumed to be the same as PM<sub>10</sub>. Since PM<sub>2.5</sub> is a subset of PM<sub>10</sub>.

**Table 3.4 – Air District Emission Factors for Contemporaneous Onsite Emission Reduction Credits for Sulfur Recovery Unit S-1002 (Appendix N)**

Pollutant	Emission Factor (lbs/LT)	Reference
PM <sub>10</sub>	3.91 E-01 (for 6/1/18-5/31/19)	2018 and 2019 Source Tests (weighted-average emission factor) for S-1002 U236 (NST-5117 and NST-5595) 2019 and 2020 Source Tests for S-1002 U236 (NST-5595 and NST-6051) 2020 and 2021 Source Tests for S-1002 U236 (NST-6051 and NST-6686)
	5.11E-01 (for 6/1/19-5/31/20)	
	4.54E-01 (for 6/1/20-5/31/21)	
PM <sub>2.5</sub>	3.91 E-01 (for 6/1/18-5/31/19)	2018 and 2019 Source Tests for S-1002 U236 (NST-5117 and NST-5595) 2019 and 2020 Source Tests for S-1002 U236 (NST-5595 and NST-6051) 2020 and 2021 Source Tests for S-1002 U236 (NST-6051 and NST-6686)
	5.11E-01 (for 6/1/19-5/31/20)	
	4.54E-01 (for 6/1/20-5/31/21)	
NO <sub>x</sub>	7.62E-01	2021 Source Test for S-1002 U236 (NST-6686)
POC	0.0014 lb/MMBtu	ICR Protocol, Table 5-7

**Table 3.5 – Air District Emission Factors for Contemporaneous Onsite Emission Reduction Credits for Sulfur Recovery Unit S-1003 (Appendix N)**

Pollutant	Emission Factor (lbs/LT)	Reference
PM <sub>10</sub>	1.81E-01 (for 6/1/18-5/31/19)	2018 and 2019 Source Tests for S-1003 U238 (NST-5117 and NST-5768)
	2.82E-01 (for 6/1/19-5/31/20)	2019 and 2020 Source Tests for S-1003 U238 (NST-5768 and NST-6051)
	3.33E-01 (for 6/1/20-5/31/21)	2020 and 2021 Source Tests for S-1003 U238 (NST-6051 and NST-6686)
PM <sub>2.5</sub>	1.81E-01 (for 6/1/18-5/31/19)	2018 and 2019 Source Tests for S-1003 U238 (NST-5117 and NST-5768)
	2.82E-01 (for 6/1/19-5/31/20)	2019 and 2020 Source Tests for S-1003 U238 (NST-5768 and NST-6051)
	3.33E-01 (for 6/1/20-5/31/21)	2020 and 2021 Source Tests for S-1003 U238 (NST-6051 and NST-6686)
NO <sub>x</sub>	3.72E-01	2021 Source Test for S-1003 U238 (NST-6686)
POC	0.0014 lb/MMBtu	ICR Protocol, Table 5-7

As shown above, the facility will utilize CERCs from shut down sources and Bank Certificate No. 1706 for POC to offset project emission increases from new and/or modified sources.

However, the actual CERCs shall be based on the future shutdown date of S-29, S-30, S-36, S-350, S-351, S-439, S-442, S-1002 and/or S-1003, and on the future effective date of the completion of physical changes to S-97 (to install controls). Per Permit Condition #27646, Part 19, the final CERCs will be adjusted based on the baseline period ending date when the emission reduction becomes enforceable (when the owner/operator relinquishes the source’s permit), in accordance with Regulation 2-2-603.3 (Baseline period ending date).

CERCs are calculated in accordance with Regulation 2-2-605 and 2-2-603 and have been adjusted downward to reflect the most stringent of RACT, BARCT, and applicable federal and District rules and regulations in effect or contained in the most recently adopted Clean Air Plan. The calculated emission reduction credits are real, permanent, quantifiable, and in excess of any reductions required by applicable regulatory requirements. Detailed ERCs are calculated in the attached Appendix N.

**Table 3.6 – Offsets Summary**

	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>2</sub>	POC
	(tons/year)	(tons/year)	(tons/year)	(tons/year)	(tons/year)
Project Emissions Increase	5.519	5.370	10	4.592	11.088
Contemporaneous Onsite Emission Reduction Credits	9.355	9.355	11.660	31.378	2.993
Un-Offset Cumulative Increase	N/A	N/A	N/A	N/A	8.095
Banking Certificate 1706 for POC					31.069
Required ERCs Banking Certificate (using 1.15:1 ratio)	N/A	N/A	N/A	N/A	9.309

Pursuant to Regulation 2-2-302, the applicant shall provide offsets for POC at a 1.15:1 ratio of the un-offset cumulative increase (of 8.095 tons/year as shown above) in emissions at the facility.

The Air District will withdraw ERC’s from the provided banking certificates and re-issue a banking certificate for 9.309 tons/year of POC to Plant #21359.

#### **4.0 Toxic Screening Analysis**

A Health Risk Assessment (HRA) is required to determine the potential impact on public health when the emissions of toxic air contaminants (TACs) are at or exceed the trigger levels outlined in Regulation 2, Rule 5, Table 2-5-1. An HRA evaluates two types of health risk: carcinogenic (cancer-causing) health risk and non-cancer health risk. For carcinogenic health risks, a project is not eligible to be permitted if the health risk associated with the project risk exceeds 10 in one million exposed population pursuant to Regulation 2-5-302.<sup>3</sup> If the risk associated with the project is less than 10 in one million, but greater than 1 in one million, the project may be permitted but must apply Best Available Control Technology for Toxics (TBACT) to reduce the health risk from the project's TAC emissions. For non-cancer health risk, the extent of the risk is specified in terms of the Hazard Index. The Hazard Index concept is based on Reference Exposure Levels (RELs) established by the California Office of Environmental Health Hazard Assessment. The REL for a particular TAC is the level below which no observable health impacts are expected, based on toxicological studies and other relevant data, and with an adequate margin of safety built in. If an exposure is below the REL, then it is considered safe because it will not be expected to cause any health problems. The Hazard Index is a way of normalizing the RELs for all of the various TACs the Air District regulates. A Hazard Index of 1.0 (HI = 1.0) equates to exposure exactly at the REL levels. A Hazard Index below 1 (HI < 1.0) indicates that exposures are below the REL levels and are therefore safe. Thus, a project is not eligible to be permitted if either the chronic or acute hazard index exceeds 1.0 pursuant to Regulation 2-5-302. If the chronic hazard index is less than 1.0 but greater than 0.2, TBACT must be applied. As demonstrated below, the project's cancer risk and hazard index are well below the risk limits in Regulation 2-5-302 and do not trigger TBACT requirements.

As shown in Tables 4.1 and Table 4.2, emissions of TACs from several sources exceed one or more trigger levels; therefore, an HRA is required. All new and modified sources and sources with an increase in TAC emissions are included in the HRA, except for sources with an increase in TAC emissions that qualify for the Regulation 2-5-114 exemption as discussed previously. In addition, exempt sources that exceed one or more trigger levels are also included in the HRA to demonstrate compliance with best available control technology for toxics (TBACT) requirement and project risk limits pursuant to Regulation 2-1-316. The total post-project emissions are evaluated in the HRA Appendix W provides the post-project hourly and annual emissions by source.

As described above, sources S-307, S-318, S-322, and S-434 and tanks S-122, S-125, S-126, S-139, S-140, and S-150, were determined to be exempt from an HRA per Regulation 2-5-114 (Limited Exemption). Although these sources are modified sources of TACs per the definition in Regulation 2-5-214, there is no increase in toxicity-weighted emissions above pre-project emissions levels, which thereby meets the exemption in Regulation 2-5-114. Please refer to Appendix J for the toxicity-weighted emissions calculations for these sources.

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<sup>3</sup> Cancer risk is expressed in terms of the statistical likelihood that additional cancer cases will develop in a population of one million people exposed to a given level of carcinogenic TACs over their entire lifetime. A cancer risk of 10 one million means that if a population of one million people was exposed at that level, one would expect ten additional cancers within that population.

**Table 4.1 – Toxic Air Contaminant Annual Emissions (lbs/year) by Source**

Chemical Name	External Floating Roof (existing; modified for Regulation 2-5 only)	Fugitive (existing; modified for Regulation 2-5 only)	Each Train (2 Total)	Fugitive (new)	Each (9 total)	Each (4 total)	Each (3 total)	TOTAL (lb/yr)	Regulation 2-5 Trigger Level (lb/yr)	HRA Triggered? (Yes/No)
	S-440* (Tank 110) (lb/yr)	S-437 (Unit 110) (lb/yr)	TO/Scrubber (new)		Baghouse (new)	Baghouse (new)	Baghouse (new)			
			S-599 (Sour Water Strippers and Amine Gas Treatment) (lb/yr)	S-599 (Sour Water Strippers and Amine Gas Treatment) (lb/yr)	S-602 (Filter Aid Silos) (lb/yr)	S-603 (Polyethylene Removal Filter Aid Day Hoppers) (lb/yr)	S-605 (Filter Aid Day Adsorption Day Hoppers) (lb/yr)			
Benzene	9.52	0.33	0.13					1.0E+01	2.9E+00	yes
1,3-Butadiene		0.26						2.6E-01	4.8E-01	no
Cresol (mixed isomers)		0.00						-		no
Ethylbenzene	5.80	0.01						5.8E+00	3.3E+01	no
n-Hexane	40.93	18.98						6.0E+01	2.7E+05	no
Hydrogen sulfide		0.25	355.80	38.0				7.5E+02	3.9E+02	yes
Mercury		0.00						-		no
Naphthalene	0.12	0.00						1.2E-01	2.4E+00	no
Phenol		0.00						-		no
Propylene		47.88						4.8E+01	1.2E+05	no
Styrene		0.00						-		no
Toluene	50.20	0.36	0.21					5.1E+01	1.2E+04	no
Xylene (mixed isomers)	32.12	0.58						3.3E+01	2.7E+04	no
PAHs (as B[a]P equiv)		0.00						-		no
Formaldehyde			4.63					9.3E+00	1.4E+01	no
Sulfuric Acid			4160					8.3E+03	3.9E+01	yes
Silica (crystalline, respirable)					90.1	49.9	49.9	1.2E+03	1.2E+02	yes
Ammonia			829.93					1.7E+03	7.7E+03	no

\* The emissions for S-440 were included in the HRA. However, Phillips 66 later withdrew their requests for changes to S-440. S-440 is no longer part of the Rodeo Renewed Project. The HRA results remain valid since the HRA results represent a more conservative estimate with the inclusion of S-440.

**Table 4.2 – Toxic Air Contaminant Hourly Emissions (lbs/hour) by Source**

Chemical Name	External Floating Roof	Fugitive	Each Train (2 Total)	Fugitive	Each (9 total)	Each (4 total)	Each (3 total)	TOTAL (lb/hr)	Regulation 2-5 Trigger Level (lb/hr)	HRA Triggered? (Yes/No)
	S-440* (Tank 110) (lb/hr)		S-437 (Unit 110) (lb/hr)		TO/Scrubber	Baghouse	Baghouse			
		S-599 (Sour Water Strippers and Amine Gas Treatment) (lb/hr)		S-599 (Sour Water Strippers and Amine Gas Treatment) (lb/hr)	S-602 (Filter Aid Silos) (lb/hr)	S-603 (Polyethylene Removal Filter Aid Day Hoppers) (lb/hr)	S-605 (Filter Aid Day Adsorption Day Hoppers) (lb/hr)			
Benzene	1.09E-03	3.74E-05	1.48E-05	0	0	0	0	1.2E-03	6.0E-02	no
1,3-Butadiene	0	2.95E-05	0	0	0	0	0	2.9E-05	1.5E+00	no
Cresol (mixed isomers)	0	0.00E+00	0	0	0	0	0	-		no
Ethylbenzene	6.62E-04	1.56E-06	0	0	0	0	0	6.6E-04		yes
n-Hexane	4.67E-03	2.17E-03	0	0	0	0	0	6.8E-03		yes
Hydrogen sulfide	0	2.90E-05	4.06E-02	4.34E-03	0	0	0	8.6E-02	9.3E-02	no
Mercury	0	0.00E+00	0	0	0	0	0	-	1.3E-03	no
Naphthalene	1.38E-05	3.46E-07	0	0	0	0	0	1.4E-05		yes
Phenol	0	0.00E+00	0	0	0	0	0	-	1.3E+01	no
Propylene	0	5.47E-03	0	0	0	0	0	5.5E-03		yes
Styrene	0	0.00E+00	0	0	0	0	0	-	4.6E+01	no
Toluene	5.73E-03	4.11E-05	2.40E-05	0	0	0	0	5.8E-03	8.2E+01	no
Xylene (mixed isomers)	3.67E-03	6.58E-05	0	0	0	0	0	3.7E-03	4.9E+01	no
PAHs (as B[a]P equiv)	0	0.00E+00	0	0	0	0	0	-		no
Formaldehyde	0	0.00E+00	5.29E-04	0	0	0	0	1.1E-03	1.2E-01	no
Sulfuric Acid	0	0.00E+00	0.47	0	0	0	0	9.5E-01	2.7E-01	yes
Silica (crystalline, respirable)	0	0.00E+00	0	0	1.03E-02	5.70E-03	5.70E-03	1.3E-01		yes
Ammonia	0		9.47E-02	0	0	0	0	1.9E-01	7.1E+00	no

\* The emissions for S-440 used for HRA modeling shown in the table above have been revised, but the revised emissions have been adjusted downward. Therefore, the HRA results remain valid since the HRA results represent a more conservative estimate.

Based on the TAC emission rates, this project passed the HRA conducted on January 7, 2022 by the Air District’s Permitting & Toxics Section. Results from the HRA indicate that the project cancer risk is 0.065 in a million, the project chronic hazard index is 0.13, and the project acute hazard index is 0.21. This complies with the Regulation 2-5-302 project risk requirements because it falls under a cancer risk of 10 in one million and because the chronic and acute hazard index are both below 1.0. The TBACT requirement of Regulation 2-5-301 is not triggered for this application since the cancer risk is below 1 in one million and the chronic hazard index is below 0.20.

**5.0 Best Available Control Technology (BACT) & Reasonably Available Control Technology (RACT)**

Per Regulation 2-2-301, BACT is triggered for any new or modified source with the potential to emit 10 pounds or more per highest day of POC, NPOC, NOx, CO, SO<sub>2</sub>, PM<sub>10</sub> or PM<sub>2.5</sub> and the modification will result in an increase in emissions of that pollutant above baseline levels. Fugitive components are also subject to BACT requirements pursuant to Regulation 2-1-128.21. BACT requires facilities to use the best control equipment available at the time a new source is installed, or an existing source is modified. More specifically, Regulation 2-2-301 requires implementation of the most stringent of the following:

- The most effective emission control device or technique that has been successfully utilized for the type of equipment comprising such a source; or
- The most stringent emission limitation achieved by an emission control device or technique for the type of equipment comprising such a source; or
- The most effective control device or technique or most stringent emission limitation that the APCO has determined to be technologically feasible for a source, taking into consideration cost-effectiveness, any ancillary health and environmental impacts, and energy requirements; or
- The most effective emission control limitation for the type of equipment comprising such a source that is contained in an approved implementation plan of any state, unless the applicant demonstrates to the satisfaction of the APCO that such limitation is not achievable.

Moreover, BACT cannot be less stringent than any emission control required by any applicable provision of federal, state or District laws, rules, or regulations.

Relevant to this application, BACT is triggered for fugitive components at sources where there will be an increase in fugitive emissions or new sources of fugitive emissions (S-307, S-318, S-322, S-434, S-437, S-599, and S-600). Additionally, S-599 must comply with BACT for SO<sub>2</sub> emissions and emissions of PM<sub>10</sub> and PM<sub>2.5</sub>.

S-599 is also subject to RACT for CO and NO<sub>x</sub> emissions. Pursuant to Regulation 2-2-102, BACT is not required for emissions of secondary pollutants that are a direct result of the use of an abatement device implemented to comply with BACT or Best Available Retrofit Control Technology (BARCT) requirements for the control of another pollutant; instead, secondary pollutants must implement RACT. Regulation 2-2-225 defines RACT as:

[T]he lowest emission limit that can be achieved by the specific source by the application of control technology taking into account technological feasibility and cost-effectiveness, and the specific design features or extent of necessary modifications to the source.

The following discusses BACT for fugitive components at S-307, S-318, S-322, S-434, S-437, S-599, and S-600, and then BACT for S-599's SO<sub>2</sub> and PM<sub>10</sub> and PM<sub>2.5</sub> emissions, followed by the RACT discussion for S-599's CO and NO<sub>x</sub> emissions.

### **1. BACT for Fugitive Components**

All fugitive components have the potential to leak, and using the typical BACT control technologies is expected to minimize the potential for a leak. However, frequent inspection and maintenance programs have been considered and are still considered one of the best control technologies available to reduce emissions from fugitive components. Finding a leak and repairing the leak within a short time frame reduces emissions. While some components may never have any detectable leaks, it is still considered unreasonable and not technologically feasible to require zero leaks as a level of control. The Air District uses a very low leak concentrations for all components and requires a frequent inspection and maintenance program in order to address BACT. Together these provide the most stringent emission limitation and effective emission control technique that are considered both technologically feasible and cost effective. The Air District is not aware of any equipment that consistently performs better than the limits discussed below.

### **BACT for Flanges, Connectors, Valves, Pumps in Light Liquid Service, and Compressors**

All new, modified, and replaced flanges and connectors, valves, pumps in light liquid service, and compressors will comply with 100 ppm leak rate threshold and thus comply with BACT requirements. Phillips 66 will continue its Leak Detection and Repair (LDAR) program to ensure that all equipment is inspected at a BACT-level monitoring frequency established in Permit Condition 27753, and repaired/replaced as needed per the time periods allowed in Regulation 8-18. For BACT, all components are monitored quarterly, with the exception of flanges and connectors, which are monitored biannually. As such, all existing, new, modified, and replaced fugitive components will satisfy BACT by complying with both the leak standard of 100 ppm and the quarterly/biannual inspection and maintenance frequency.

The Air District reviewed BACT determinations from California Air Pollution Control Officers Association (CAPCOA), California Air Resources Board (CARB) BACT Clearinghouse, the EPA RACT/BACT/LAER Clearinghouse (RBLC), the South Coast Air Quality Management District (SCAQMD) BACT determinations and guidelines, Santa Barbara AQMD BACT guidelines, Sacramento Metropolitan AQMD BACT determinations, San Joaquin Valley AQMD BACT Clearinghouse, and Texas Commission on Environmental Quality (TCEQ) BACT Guidelines. Air Districts, including BAAQMD, have established BACT guidelines for fugitive components by requiring BACT technologies for components and/or implementing a Leak Detection and Repair (LDAR) program to monitor and repair/replace components at an established leak rate threshold. Thus, the “achieved in practice” BACT determination for fugitive components continues to be the lowest leak rate thresholds at 100 ppm. (See Appendix Q). Other agencies have the same leak threshold of 100 ppm, but no other agency has demonstrated or required a lower leak threshold.

#### **BACT for Pumps in Heavy Liquid Service**

Heavy liquids are less volatile and thus less likely to leak. Accordingly, the Air District is imposing a 50 ppm leak limit for these 154 pumps at S-600 Pretreatment Unit that will be in heavy liquid service. Pumps proposed by Phillips 66 are expected to meet this limit. Permit Condition #27658 will require that if a pump leaks greater than 50 ppm (measured as C1) twice within any consecutive 5-year period, Phillips 66 will replace the pump with the following technology: double mechanical seals with barrier fluid; magnetically coupled pumps; canned pumps; magnetic fluid sealing technology seal system with leakage vent to thermal oxidizer; or other BAAQMD approved equivalent control device; or Air District approved control technology as determined by the APCO on all pumps per new Permit Condition 27658. The 154 pumps must be tagged, identified and must comply with the quarterly LDAR program per BACT and Regulation 8-18.

#### **BACT for Pressure Relief Devices**

In some applications, BACT for pressure relief valves includes installing rupture disks (RD) and routing the relief vent to the flare gas recovery system capable of achieving a combined recovery/destruction efficiency of at least 98 percent by weight. However, here, RDs pose a safety hazard. Installing an RD on pressure relief devices can cause over-pressurization and premature release and thereby impact the function and setpoint of the RD and prevent an RD from bursting. RDs are usually used in corrosive atmospheres to protect the valve. The pressure relief valves for this project are not used in a corrosive atmosphere (the renewable materials are not considered to be corrosive) and due to these potential hazards, RD is not considered either achieved in practice or technologically feasible for this application. In lieu of installing RDs, Phillips 66 will be required per Condition #27658 to install and operate an Air-District-approved continuous parametric monitoring system that detects PRD discharges to the fuel gas recovery system or flare. This monitoring is necessary to ensure corrective actions are taken in the event of a PRD discharge, such as reseating the PRD.

#### **2. BACT and/or RACT for Sour Water Strippers and Amine Gas Treatment System (S-599)**

As shown in Table 2.10.1, S-599 is a new source and has the potential to emit 84.4 pounds of NO<sub>x</sub> per day, 30.5 pounds of CO per day, 38.7 pounds of SO<sub>2</sub> per day, and 22.8 pounds per day of PM<sub>10</sub>/PM<sub>2.5</sub>. SO<sub>2</sub> as well as PM<sub>10</sub> and PM<sub>2.5</sub> are primary pollutants and must meet BACT. CO and NO<sub>x</sub> are formed as a result S-599’s abatement functionality and, accordingly, are secondary pollutants; therefore, they are subject to RACT.

The following begins by providing more details on the abatement operations at S-599. Then the BACT and RACT analyses for S-599 are provided.

#### **Summary of Proposed Control System Technology and Pollutants Targeted (U237 Sulfur Treatment Unit)**

As described previously, Unit 237 STU is a new abatement package consisting of two trains. Each train will have a thermal oxidizer followed by an SO<sub>2</sub> caustic scrubber.<sup>4</sup> The oxidizer converts H<sub>2</sub>S to SO<sub>2</sub> and converts ammonia

<sup>4</sup> Train #1:

- A-598 Thermal Oxidizer (B-201 Main Burner, B-202 Reduction Furnace, B-203 Oxidation Furnace, B-204 Auxiliary Burner, and E-205 Waste Heat Boiler, 7.4 MMBtu/hr) and
- A-599 SO<sub>2</sub> Scrubber (D-211 Venturi, D-212 Caustic Scrubber, D-213 Cold Stack)



primarily to nitrogen, with some residual NO<sub>x</sub> formation. The caustic scrubber removes the SO<sub>2</sub>. The treated exhaust gas from the scrubber will be vented to atmosphere through a cold stack.

Sour water gas originates from gases absorbed in the water that is either injected at the process units in order to control corrosion or generated through the reactions which produce renewable diesel. Currently, most process units contribute to the flow of amine and sour water gas. Post-project, the sources of sour water will be process units 240 (S-307), 246 (S-434), and 250 (S-460). Sour water from these process units is sent to the existing sour water strippers, and sour water gas is generated by the sour water strippers. This sour water gas will then be sent to Unit 237 (S-599). At Unit 237 (S-599), the sour water gas is combusted and the resultant exhaust stream is scrubbed before being released to atmosphere. U237 scrubber water is sent to the existing stripped sour water lines and then to U100 WWTP.

The thermal oxidizer system is designed to burn Sour Water Stripper (SWS) Gas, Acid Gas, and Vent Gas from the processing plant. SWS Gas contains ammonia, so it is burned in a reducing environment to minimize the conversion of nitrogen bound in the ammonia to NO<sub>x</sub>. Ammonia also has a very high autoignition temperature, so it requires a high operating temperature in order to achieve complete destruction of the ammonia. This is achieved by using a single Zeeco high-intensity burner to burn both the SWS Gas and required natural gas in the Reducing Furnace. The high-intensity burner is specialized to get complete destruction of the ammonia and other combustibles in the SWS Gas. Given the required high-intensity burner design and high operating temperature, the NO<sub>x</sub> generated by combustion of the SWS Gas can't be reduced further than that achieved in the Reducing Furnace.

Flue gas from the Reducing Furnace is oxidized in the Oxidizing Furnace to convert the CO (from incomplete combustion) and H<sub>2</sub> to CO<sub>2</sub> and H<sub>2</sub>O. Acid Gas and Vent Gas are also burned in the oxidizing furnace to fully oxidize the H<sub>2</sub>S and hydrocarbons to SO<sub>2</sub>/SO<sub>3</sub>, CO<sub>2</sub>, and H<sub>2</sub>O. The Oxidizing Furnace has one Zeeco diffusion-mix burner to handle the acid gas and natural gas required to achieve good destruction efficiency for the acid gas and complete combustion of the natural gas. It is a single burner that stages in the acid gas after the natural gas to achieve stable combustion and the lowest possible levels of NO<sub>x</sub> for this application. There is a scrubber package downstream of the thermal oxidizer package that will further reduce the SO<sub>2</sub>/SO<sub>3</sub> from the flue gas before it is discharged to the atmosphere.

In the current Rodeo refinery configuration, the ammonia resulting from the process is converted to nitrogen and water by thermally converting the ammonia in the sulfur recovery plant's reaction furnace at +2,100 F. Post-project, much smaller quantities of ammonia and H<sub>2</sub>S will be generated and therefore utilizing a traditional crude refinery sulfur recovery plant is not practical for long term continuous operation. The use of a thermal oxidizer provides a means to convert ammonia to nitrogen and water in the future operation. To remove the ammonia, Phillips 66 will utilize U237 Sulfur Treatment Unit, which is a modern technology staged thermal oxidizer that is designed to minimize NO<sub>x</sub> formation. The Air District reviewed traditional low- and ultra-low NO<sub>x</sub> burners and determined that these burners are infeasible due to flame instability. The proposed burner design utilizes ultra low-NO<sub>x</sub> burner technologies by premixing the combustion air with the fuel prior to entering the combustion zone.

The U237 STU consists of a two-staged thermal oxidizer: reduction and oxidation furnaces. In the first stage (reduction furnace), temperature is minimized (~2100 – 2200 F) and less oxygen is introduced to minimize NO<sub>x</sub> formation. In the second stage (oxidation furnace), amine acid gas stream is fed into the system to reduce temperature (1500 F) and thereby further reduce NO<sub>x</sub> emissions. This system is also expected to minimize the amount of CO emissions due to this two-staged combustion configuration and the elevated temperatures (> 1400 F) of both stages. Furthermore, the Air District evaluated the use of an SCR with this thermal oxidizer, but determined that an SCR would not be cost effective or achieved in practice, as discussed in the "NO<sub>x</sub> (RACT pollutant)" section below.

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Train #2:

- A-600 Thermal Oxidizer (B-201 Main Burner, B-202 Reduction Furnace, B-203 Oxidation Furnace, B-204 Auxiliary Burner, and E-205 Waste Heat Boiler, 7.4 MMBtu/hr) and
- A-601 SO<sub>2</sub> Scrubber (D-211 Venturi, D-212 Caustic Scrubber, D-213 Cold Stack)

**Summary of Applicable BACT/RACT**

As stated above, the STU is being proposed as a replacement for U235 SRU (S-1010), which will now serve as a backup unit. Both the STU and U235 are specifically used to comply with the requirements of Regulation 9-1, including Regulations 9-1-307 (Emission limitations for Sulfur Recovery Plants, 250 ppmv (dry) limit for SO2) and 9-1-313.2 (Operation of a sulfur removal and recovery system that moves and recovers 95 percent of H2S from refinery fuel gas, 95% of H2S and ammonia from process water streams (sulfur recovery is required when a facility removes 16.5 tons/day or more of elemental sulfur)). Therefore, in accordance with Regulation 2-2-102:

- SO2 is considered a primary pollutant per Regulation 2-2-102 since the STU is used to meet the SO2 limit in 9-1-302 and is therefore required to meet BACT requirements.
- PM10 and PM2.5 consist of emissions of sulfuric acid mist, which is a sulfur compound. Therefore, PM10 and PM2.5 are considered primary pollutants per Regulation 2-2-102 and thus are required to meet BACT requirements.
- POC is a secondary pollutant per Regulation 2-2-102, but emissions do not exceed 10 pounds per highest day. Therefore, POC is not required to meet BACT or RACT requirements.
- NOx and CO are products of combustion at the thermal oxidizer of U237. They are secondary pollutants since each is a pollutant that is the direct result of the use of an abatement device implemented to comply with BARCT. Thus, they must meet RACT requirements rather than BACT requirements.

**SO2 (BACT pollutant)**

The Air District investigated emission control technologies to determine BACT for SO2 emissions at S-599. A top-down BACT analysis of the relevant control technologies— a wet scrubber or dry scrubber— is provided in Appendix Q, Table Q-2. A wet scrubber is a control technology that is capable of removing inorganic fumes, vapors and gases such as SO2. A dry scrubber is a control technology used to remove water soluble contaminants such as SO2. A wet scrubber is determined to be BACT because it can achieve a 99.9 percent control efficiency, which is greater than a dry scrubber, which can only achieve an 85-95 percent control efficiency. The Air District staff conducted a thorough review and did not identify any examples of control devices that are technologically feasible and cost-effective or have been achieved in practice that can achieve greater than 99.9 percent control efficiency.

**PM10 and PM2.5 (BACT pollutants)**

The Air District investigated emission control technologies to determine BACT for PM10 and PM2.5 emissions at S-599 as discussed in Appendix Q, Table 1, and summarized below.

Control Technology	Baghouse/Fabric Filter	Dry Electrostatic Precipitator – Pipe Type (ESP)	Wet Electrostatic Precipitator – Wire Type (ESP)	Wet Scrubber	High-Efficiency Cyclones
Overall Control Efficiency	99 – 99.9%	90 – 99.9%	90 – 99.9%	98%	20-70%
Technologically Feasible	No	No	No	Yes	No

As shown, though several technologies have the potential to achieve slightly greater control efficiency than a wet scrubber, no other technology is technologically feasible due to the conditions at S-599. A baghouse/fabric filter is not technologically feasible because it cannot operate in a moist environment as will be present at the STU. The STU thermal oxidizers' flowrate will be far below the typical flow rates needed for a high-efficiency cyclone, a dry electrostatic precipitator, or a wet electrostatic precipitator. Further, a dry electrostatic precipitator is not

recommended for removing sticky or moist particles, and the operating range of a wet electrostatic precipitator is far below the operating temperature of S-599's thermal oxidizers. Thus, a wet scrubber is the most stringent and technologically feasible control option for SO<sub>2</sub>, as shown in the RACT/BACT/LAER Clearinghouse.

#### **CO (RACT pollutant)**

CO is subject to RACT because it is a secondary pollutant. The proposed U237 STU provides new technology that utilizes a unique two-staged oxidation process as described above. As discussed below, this technology ensures that secondary NO<sub>x</sub> emissions are abated to the lowest achievable level. Abatement of NO<sub>x</sub> is prioritized because the Bay Area is not in attainment of the state and federal ambient air quality standards for ozone (NO<sub>x</sub> is a precursor to ozone formation), whereas it is in attainment of CO standards. Additionally, as discussed above, the two-staged combustion configuration and the elevated temperatures (> 1400 F) of both stages will minimize CO emissions. The proposed U237 STU has been guaranteed by the manufacturer to achieve 90 ppmv @ 3% O<sub>2</sub> (equivalent to 0.09 lbs CO/MMBtu). The Air District did not find any lower emission limits utilizing the new two-stage technology. This investigation included Air District review of the RACT/BACT/LAER Clearinghouse and regulations and projects at other air districts. Since the Air District could not find any lower emissions limits applicable to the new technology, the Air District has concluded that the use of this technology and achieving 90 ppmv @ 3% O<sub>2</sub> limit meets RACT requirements for CO. Condition #27648 requires compliance with this RACT limit to be demonstrated via annual source testing.

#### **NO<sub>x</sub> (RACT pollutant)**

Thermal oxidizers most commonly are natural gas-fired systems used to control VOC emissions. The NO<sub>x</sub> emissions generated by these systems result from prompt NO<sub>x</sub> formed by the oxidation of atmospheric nitrogen present in the combustion air at high temperatures. Applicable RACT limits account for combustion-related emissions only. The thermal oxidizers at S-599 abate both ammonia and H<sub>2</sub>S generated by renewable fuels production. This is significant because the combustion/conversion of ammonia at the thermal oxidizers produces a combination of nitrogen gas and additional NO<sub>x</sub> emissions. Therefore, the RACT limit for these thermal oxidizers must account for NO<sub>x</sub> emissions from both combustion and ammonia conversion.

To inform the RACT determination, the Air District investigated whether BACT emission limits or control techniques have been imposed for a sulfur treatment unit at a similar facility. This included a review of sources within the Air District's jurisdiction and BACT databases maintained by SMAQMD, SJVAQCD, and SCAQMD. There was no relevant precedent as the only listings were for sulfur recovery units at petroleum refineries, which constitute a and inapplicable source category from renewable fuels. Further, the database listings did not have a NO<sub>x</sub> BACT determination at an SRU. Similarly, EPA's RACT/BACT/LAER Clearinghouse (RBLC) only provided limits for petroleum refineries, and the limits were source-specific and lacked normalized limits (e.g., lb/MMBtu limits) that could be applied to facilities of any size.

The Air District additionally searched for permits for other renewable fuel production facilities. Six facilities were identified, but none include permit limits for a sulfur treatment unit. As a result, there were no NO<sub>x</sub> limits for comparable sources to inform the RACT determination.

In the absence of relevant precedent, the Air District determined the appropriate RACT limit based on technical feasibility and cost-effectiveness. Based on the conversion rate of ammonia to NO<sub>x</sub>, the achievable RACT limit for the STU thermal oxidizer is determined to be 50 ppm @ 15% O<sub>2</sub> (equivalent to 150 ppm @ 3% O<sub>2</sub>). The Air District had multiple discussions with the equipment vendor, and the vendors agreed to reduce the manufacturer-guaranteed outlet NO<sub>x</sub> concentration from the originally proposed 100 ppm @ 15% O<sub>2</sub> down to 50 ppm @ 15% O<sub>2</sub>. The Air District also conducted a thorough review of currently available thermal oxidizer technologies, prior permit applications involving thermal oxidizers, and discussed thermal oxidizer projects with various equipment vendors. Based on this review and the discussions with the vendors, the Air District concluded that the proposed STU thermal oxidizer represents the technology capable of the lowest achievable limit.

In addition to the above RACT emission limits, the Air District evaluated whether a more stringent control option would constitute RACT for NOx. The Air District determined there is no cost-effective and technologically feasible control option.

First, the Air District found that there are no comparable amine gas and sour water stripper operations in the Air District's jurisdiction or in other jurisdictions that involve the use of add-on control technologies. In other industries, BACT technology for controlling NOx emissions consists of the use selective catalytic oxidation (SCR). However, this option is neither cost-effective nor technologically feasible. The BACT guidelines threshold for cost-effectiveness is \$17,500/ton of NOx reduced. Using the examples of existing SCRs (as shown in Appendix Q, Table Q-3), the lowest adjusted installed cost estimate of \$1.22 million results in a cost effectiveness of \$21,531/ton of NOx reduced (as shown in Appendix Q, Table Q-5). This exceeds the BACT cost-effectiveness threshold and thus also exceeds the RACT cost-effectiveness threshold since BACT imposes a more stringent abatement standard.

Furthermore, based on the quote provided by the equipment vendor, installing an SCR would require redesign of the STU and installation of an additional burner. These changes would result far higher cost-effectiveness calculation of \$236,382/ton of NOx reduced (as shown in Appendix Q, Table Q-6). Thus, while the addition of an SCR may be technologically feasible, the Air District has determined it does not constitute RACT when considering cost-effectiveness and the extent of necessary modifications to the source.

To help further reduce permitted NOx emissions, Permit Condition #27648 will limit the combined NOx emissions from S-599 (U237 STU) and S-1010 (U235 SRU) to 10 tons/year.

## **6.0 Statement of Compliance**

### ***6.1 Air District Regulations, New Source Performance Standards (NSPS), and National Emission Standards for Hazardous Air Pollutants (NESHAP) Applicability by Source***

See Appendix P.

### ***6.2 California Environmental Quality Act (CEQA)***

As the lead agency for the project, Contra Costa County (County) prepared the Rodeo Renewed Environmental Impact Report (EIR) (State Clearinghouse No. 2020120330) pursuant to CEQA. On December 21, 2020, the County released a Notice of Preparation and held a scoping meeting on January 20, 2021. On October 14, 2021, the County posted a Notice of Availability for the Draft Environmental Impact Report (DEIR). The comment period began on October 18, 2021 and was extended to December 17, 2021. The Air District submitted comments on the DEIR. The Final EIR was presented to the County Planning Commission for adoption on March 30, 2022 and was appealed. The Final EIR was adopted by the Contra Costa Board of Supervisors on May 3, 2022 pursuant to the provisions of CEQA. The EIR identified certain potentially significant environmental impacts that could occur as a result of the project. The Final EIR and associated documents for the project are available to the general public for review at the Contra Costa County Community Development Department, 651 Pine Street, 4th Floor, North Wing, Martinez, CA, 94553, or online at [www.contracosta.ca.gov/7945/Phillips-66-Rodeo-Renewed-Project](http://www.contracosta.ca.gov/7945/Phillips-66-Rodeo-Renewed-Project).

In evaluating the project in its role as responsible agency, the Air District considered the environmental impacts of the project as documented in the Final EIR. The Air District prepared draft CEQA Findings and a draft Statement of Overriding Considerations for the project. The Air District made final Findings and a final Statement of Overriding Considerations after considering public comments.

### ***6.3 Public Notifications***

#### ***Public Notice, Schools & Overburdened Communities (Regulation 2-1-412)***

Public notice is required if an application for an authority to construct or permit to operate for (i) a new or modified source located within 1000 feet of the outer boundary of a K-12 school site and which results in the

increase in emissions of any substance into the ambient air which has been identified by the California Air Resources Board or the APCO as a toxic air contaminant or a hazardous air contaminant or which is on the list required to be prepared pursuant to subdivision (a) of Section 25532 or Section 44321 subsections (a) to (f) inclusive of the Health and Safety Code, or (ii) a new or modified source located within an Overburdened Community as defined in Section 2-1-243 and for which a Health Risk Assessment is required pursuant to Section 2-5-401. This project is over 1,000 feet from the nearest K-12 school, and is therefore not subject to the public notification requirements for proximity close to a school. However, this is an application for new and modified sources located within an Overburdened Community and a Health Risk Assessment is required; therefore, public notice is required prior to approving this application.

Pursuant to Regulation 2-1-412, a public notice was prepared for a 30-day public comment period. The Air District has reviewed and considered all comments received during the 30 days public comment period, and has included written responses to the comments in the permit application file prior to taking final action on the application.

A 30-day public comment period started on 11/15/2022 and ended on 12/15/2022. Notice describing the project and announcing the public comment period was posted on the Air District's website, mailed to residential and business neighbors within 1,000 feet of new/modified sources, and mailed/e-mailed to the Air District's CEQA/Energy Projects Interested Parties list. The Air District received 12 written comments and 3 voicemail comments. Prior to making the final determination, the Air District responded to all commenters (by email or phone) in January 2023 to address the comments. See Appendix U for the Air District's responses to the public comments.

During the public comment period, the Air District also received several comments from Phillips 66 regarding the draft permit conditions. Several minor revisions were made to the draft permit conditions per these comments, while other minor revisions were made as a result of further Air District review. See Appendix R for the permit conditions in underline/strikeout format to denote these revisions.

*Publication of Notice and Opportunity for Public Comment (Regulation 2-2-404)*

Public notice is required if an application is for (i) a new major facility or a major modification of an existing major facility, (ii) any new facility, or a modification to any existing facility will involve an increase in emissions in an amount that is significant as defined in Section 2-2-227.2, or (iii) a PSD Project. This application is not a major modification of an existing major facility, does not involve an increase in emissions in an amount that is significant, and not a PSD project; therefore, public notice is not triggered per Regulation 2-2-204.

*Publication, Public Comment and Inspection (Regulation 2-4-405)*

Public notice is required for banking applications of any emission reduction in excess of 40 tons per year of any pollutant. This is not a banking application; therefore, public notice is not triggered per Regulation 2-4-405.

*Public Participation, Major Facility Review Permit Issuance (Regulation 2-6-412)*

Public notice is required for major facility review permit issuance of any proposed initial issuance, significant revision or five-year renewal of a major facility review permit. Phillips 66 has submitted a major facility review application (Application No. 31158) for a significant revision to the Title V permit. This application is not a major facility review application; therefore, public notice is not triggered per Regulation 2-6-412.

**6.4 Prevention of Significant Deterioration (PSD)**

As shown in Appendix T, there is no net increase in emissions as a result of this project; therefore, this project is not a PSD project as defined in Regulation 2-2-224. The emission calculations in Appendix T demonstrates that the Rodeo Renewed Project is not a major modification and the emissions are below PSD threshold levels as defined in Regulation 2-2-218.

Additionally, per Condition 27646, within 5 years of operation of the Rodeo Renewed Project, Phillips 66 will be required to perform another PSD demonstration to demonstrate that this project is not a Major Modification.

### **7.0 Permit Conditions**

See Appendix R for new and revised existing conditions.

### **8.0 Title V Permit**

This facility is a major facility that operates pursuant to, and in compliance with, a federal operating permit, aka Title V permit, pursuant to Regulation 2, Rule 6, Major Facility Review. Phillips 66 submitted Application 31158 for a significant revision to the Title V permit.

### **9.0 Recommendation**

I recommend that the Air District issue an Authority to Construct and Certificate of Exemption for the following sources/abatement devices:

#### **Existing Sources**

<b>Source/ Abatement Device No.</b>	<b>Source/Abatement Description</b>	<b>Requested Permit Action</b>
S-11	U240_B-201 Heater, 108 MMBtu/hr	Authority to Construct/ Permit to Operate
S-12	U240 B-202 Heater, 42 MMBtu/hr	Authority to Construct/ Permit to Operate
S-13	U240_B-301 Heater, 194 MMBtu/hr, abated by A-113 U240 B-301 Heater SCR Unit	Authority to Construct/ Permit to Operate
S-22	U248_B-606 HEATER, 31 MMBtu/hr	Authority to Construct/ Permit to Operate
S-45	Heavy Gas Oil Feed Heater U246, B-801 A/B Heater, 85 MMBtu/hr, abated by A-47 Selective Catalytic Reduction Unit for U240 HGO Feed Heater	Authority to Construct/ Permit to Operate
S-70	Rail Renewable Feedstock Unloading Rack (formerly Butane Loading Rack), abated by A-7 Vapor Recovery System	Certificate of Exemption
S-90	TANK NO. 67, 2100 thousand gallons	Certificate of Exemption
S-97	TANK NO. 100, 12474 thousand gallons, abated by A-626 Activated Carbon Vessel	Certificate of Exemption
S-99	TANK NO. 102, 7140 thousand gallons	Certificate of Exemption
S-101	Tank 104 Storm Water Equalization, 5500 thousand gallons	Authority to Construct/ Permit to Operate
S-102	Tank 105 Storm Water Equalization, 5500 thousand gallons	Authority to Construct/ Permit to Operate
S-103	TANK NO. 106, 3276 thousand gallons	Certificate of Exemption
S-105	TANK NO. 129, 3066 thousand gallons	Certificate of Exemption
S-106	Tank 130 Stormwater Equalization, 10600 thousand gallons	Authority to Construct/ Permit to Operate
S-108	TANK NO. 153, 5586 thousand gallons	Certificate of Exemption
S-110	TANK NO. 155, 47,000 bbls	Certificate of Exemption
S-111	TANK NO. 156, 100,000 bbls	Certificate of Exemption
S-112	TANK NO. 157, 100,000 bbls	Certificate of Exemption
S-113	TANK NO. 158, 101,000 bbls	Certificate of Exemption
S-114	TANK NO. 159, 136,000 bbls	Certificate of Exemption

<b>Source/ Abatement Device No.</b>	<b>Source/Abatement Description</b>	<b>Requested Permit Action</b>
S-122	TANK 167, 3.1 MM gallons	Authority to Construct/ Permit to Operate
S-125	Tank 170, 3024 thousand gallons	Authority to Construct/ Permit to Operate
S-126	Tank No. 172, 75,000 bbls	Authority to Construct/ Permit to Operate
S-127	TANK NO. 173, 3024 thousand gallons	Certificate of Exemption
S-135	Tank #200, 79,000 bbls, abated by A-7 Vapor Recovery System	Certificate of Exemption
S-137	TANK NO. 202, 88,000 bbls, abated by A-7 Vapor Recovery System	Certificate of Exemption
S-139	TANK NO. 204, 81,000 bbls, abated by A-7 Vapor Recovery System	Authority to Construct/ Permit to Operate
S-140	TANK #205, 54,000 bbls, abated by A-7 Vapor Recovery System	Authority to Construct/ Permit to Operate
S-150	TANK NO. 241, 79,000 bbls	Authority to Construct/ Permit to Operate
S-173	TANK #280, 134,000 bbls, abated by A-7, Vapor Recovery System,	Certificate of Exemption
S-174	TANK #281, 134,000 bbls, abated by A-7, Vapor Recovery System	Certificate of Exemption
S-175	TANK #284, 134,000 bbls, abated by A-7, Vapor Recovery System	Certificate of Exemption
S-188	TANK NO. 300, 378 thousand gallons, abated by A-7 Vapor Recovery System	Certificate of Exemption
S-189	TANK NO. 301, 189 thousand gallons, abated by A-7 Vapor Recovery System	Certificate of Exemption
S-190	TANK NO. 302, 756 thousand gallons, abated by A-7 Vapor Recovery System	Certificate of Exemption
S-195	Tank 501, Sludge (API sediment, DAF float & sediment), 2,500 bbls	Authority to Construct/ Permit to Operate
S-204	TANK NO. 528, 1806 thousand gallons	Certificate of Exemption
S-205	TANK NO. 529, 1806 thousand gallons	Certificate of Exemption
S-253	TANK NO. 833, 189 thousand gallons, abated by A-7 Vapor Recovery System	Certificate of Exemption
S-254	TANK NO. 1001, 104,000 bbls	Authority to Construct/ Permit to Operate
S-256	Tank No. 1003 , 104,000 bbls	Authority to Construct/ Permit to Operate
S-257	Tank No. 1004 , 104,000 bbls	Authority to Construct/ Permit to Operate
S-261	TANK NO. 1010, 104,000 bbls	Certificate of Exemption
S-262	TANK NO. 1011, 4368 thousand gallons	Certificate of Exemption
S-263	Tank 1012, , 4200 thousand gallons	Certificate of Exemption
S-296	C-1 FLARE, 6.6 MMBtu/hr pilot	Authority to Construct/ Permit to Operate

<b>Source/ Abatement Device No.</b>	<b>Source/Abatement Description</b>	<b>Requested Permit Action</b>
S-307	U240 UNICRACKING UNIT 240, abated by: S-1002 Sulfur Plant - Unit 236 S-1003 Sulfur Plant Unit 238 S-296 C-1 Flare	Authority to Construct/ Permit to Operate
S-309	U248_UNISAR UNIT 248, abated by: S-1002 Sulfur Plant - Unit 236 S-1003 Sulfur Plant Unit 238 S-296 C-1 Flare	Authority to Construct/ Permit to Operate
S-318	Unit 76	Authority to Construct/ Permit to Operate
S-322	U40_RAW MATERIALS RECEIVING	Authority to Construct/ Permit to Operate
S-324	324 U100_API OIL WASTEWATER SEPARATOR (with outlet channel cover), abated by A-53 Thermal Oxidizer for S-324	Authority to Construct/ Permit to Operate
S-334	Tank #107, 180,000 bbls	Certificate of Exemption
S-338	U233 FUEL GAS CENTER, 7.5E6 cubic feet/hr	Authority to Construct/ Permit to Operate
S-339	U80_REFINED OIL SHIPPING UNIT	Authority to Construct/ Permit to Operate
S-340	TANK #108, 200,000 bbls	Certificate of Exemption
S-341	TANK #208, 103,000 bbls	Authority to Construct/ Permit to Operate
S-342	TANK #209, 103,000 bbls	Authority to Construct/ Permit to Operate
S-352	Combustion Turbine (16.6 MW), 291 MMBtu/hr, abated by S-355 Supplemental Firing Duct Burners	Authority to Construct/ Permit to Operate
S-353	Combustion Turbine (16.6 MW), 291 MMBtu/hr, abated by S-356 Supplemental Firing Duct Burners	Authority to Construct/ Permit to Operate
S-354	Combustion Turbine (16.6 MW), 291 MMBtu/hr, abated by S-357 Supplemental Firing Duct Burners	Authority to Construct/ Permit to Operate
S-355	Supplemental Firing Duct Burners, 175 MMBtu/hr, abated by A-13 SCR/CO Converter Unit	Authority to Construct/ Permit to Operate
S-356	Supplemental Firing Duct Burners, 175 MMBtu/hr, abated by A-14 SCR/CO Converter Unit	Authority to Construct/ Permit to Operate
S-357	Supplemental Firing Duct Burners, 175 MMBtu/hr, abated by A-15 SCR/CO Converter Unit	Authority to Construct/ Permit to Operate
S-360	Mid-Barrel Tank 223, 110,000 bbls, abated by A-7 Vapor Recovery System	Certificate of Exemption
S-381	Aeration Tank, Pact (F-201), 1.2 MM gallons	Authority to Construct/ Permit to Operate



<b>Source/ Abatement Device No.</b>	<b>Source/Abatement Description</b>	<b>Requested Permit Action</b>
S-382	Aeration Tank, Pact (F-202), 1.2 MM gallons	Authority to Construct/ Permit to Operate
S-383	Clarifier, F-203, 0.69 MM gallons	Authority to Construct/ Permit to Operate
S-384	Clarifier (F-204), 0.69 MM gallons	Authority to Construct/ Permit to Operate
S-385	Media Filter (F-271 to F-278), 420,000 gallons/hr	Authority to Construct/ Permit to Operate
S-386	PAC Regeneration Sludge Thickener (F-211), 44,000 gallons	Authority to Construct/ Permit to Operate
S-387	Wet Air Regeneration (P-202), 15 gpm	Authority to Construct/ Permit to Operate
S-390	F-248 Thickened Sludge Storage, 26.5 thousand gallons	Authority to Construct/ Permit to Operate
S-398	MP-30 Flare, 3.1 MMBtu/hr pilot	Authority to Construct/ Permit to Operate
S-400	Wet Weather Wastewater Sump, abated by A-40 Wet Weather Sump Vented Cover	Authority to Construct/ Permit to Operate
S-401	Dry Weather Wastewater Sump, abated by A-41 Dry Weather Sump Vented Cover	Authority to Construct/ Permit to Operate
S-425	Marine Terminal Berth M1, 2 permitted arms, abated by A-420 Thermal Oxidizer	Authority to Construct/ Permit to Operate
S-426	Marine Terminal Berth M2, 4 permitted arms, abated by A-420 Thermal Oxidizer	Authority to Construct/ Permit to Operate
S-434	U246 High Pressure Reactor Train	Authority to Construct/ Permit to Operate
S-437	Hydrogen Manufacturing Unit, abated by S-438 U110_H-1 Furnace (H2 Plant Reforming)	Authority to Construct/ Permit to Operate
S-438	U110_H-1 Furnace (H2 Plant Reforming), 250 MMBtu/hr, abated by A-46 Selective Catalytic Reduction Unit	Authority to Construct/ Permit to Operate
S-445	Tank 271 , 189,000 bbls, abated A-7 Vapor Recovery System	Certificate of Exemption
S-446	Tank 310 (ISOPENTANE), 1722 thousand gallons, abated by A-7 Vapor Recovery System	Permit to Operate
S-447	Tank 311 (Isopentane), 1722 thousand gallons, abated by A-7 Vapor Recovery System	Permit to Operate
S-448	Tank 1007 (Blendstock Receiving), 243,000 bbls	Certificate of Exemption
S-449	TANK #285, 189,000 bbls, abated by A-7, Vapor Recovery System	Certificate of Exemption
S-453	U236 Cooling Tower, 13,500 gpm	Authority to Construct/ Permit to Operate
S-455	U240 Cooling Tower, 33,000 gpm	Authority to Construct/ Permit to Operate
S-456	U110 Cooling Tower, 750 gpm	Certificate of Exemption
S-465	Unit 235 Sulfur Pit-Tank, 200 long ton/day, abated by S-1010 U235 Sulfur Recovery Unit	Authority to Construct/ Permit to Operate
S-500	ULSD Cooling Tower, 7639 gpm	Certificate of Exemption

Source/ Abatement Device No.	Source/Abatement Description	Requested Permit Action
S-503	Sulfur Storage Tank, 471 long ton/day, abated by S-1003 Sulfur Plant Unit 238	Authority to Construct/ Permit to Operate
S-504	Sulfur Degassing Unit, 400 long ton/day, abated by S-1003 Sulfur Plant Unit 238	Authority to Construct/ Permit to Operate
S-505	Sulfur Truck Loading Rack, 200 gpm sulfur, abated by S-1003 Sulfur Plant Unit 238	Authority to Construct/ Permit to Operate
S-506	Fixed Roof Tank 257, 80,000 bbls, abated by A-7, Vapor Recovery System,	Certificate of Exemption
S-599	<p>S-599 Sour Water Strippers and Amine Gas Treatment System, abated by Unit 237 Sulfur Treatment Unit (2 Trains), consisting of:</p> <p>Train #1: A-598 Thermal Oxidizer (B-201 Main Burner, B-202 Reduction Furnace, B-203 Oxidation Furnace, B-204 Auxiliary Burner, and E-205 Waste Heat Boiler, 7.4 MMBtu/hr) and A-599 SO<sub>2</sub> Scrubber (D-211 Venturi, D-212 Caustic Scrubber, D-213 Cold Stack)</p> <p>Train #2: A-600 Thermal Oxidizer (B-201 Main Burner, B-202 Reduction Furnace, B-203 Oxidation Furnace, B-204 Auxiliary Burner, and E-205 Waste Heat Boiler, 7.4 MMBtu/hr) and A-601 SO<sub>2</sub> Scrubber (D-211 Venturi, D-212 Caustic Scrubber, D-213 Cold Stack)</p>	Authority to Construct/ Permit to Operate
S-600	Pretreatment Unit (PTU), consisting of 3 trains, 80,000 bbls/day, abated by A-622 and A-624 Biofilters and A-623 and A-625 Carbon Adsorption Systems	Authority to Construct/ Permit to Operate
S-601	Bleaching Earth Storage Silos (12), each abated by A-627 through A-638 Pulse Jet Dust Houses (12), 1,600 dscfm maximum each	Certificate of Exemption
S-602	Filter Aid Storage Silos (9) and Truck Loading/Traffic, each abated by A-606 through A-614 Pulse Jet Dust Houses (9), 1,600 dscfm maximum each	Authority to Construct/ Permit to Operate
S-603	Polyethylene Removal Filter Aid Day Hoppers (4), abated by A-615 and A-618 Dust Filters (4), 665 dscfm maximum each	Authority to Construct/ Permit to Operate

<b>Source/ Abatement Device No.</b>	<b>Source/Abatement Description</b>	<b>Requested Permit Action</b>
S-604	Bleaching Earth Adsorption Day Hoppers (6), 665 dscfm maximum each, abated by A-639 through A-644 Dust Filters (6), 665 dscfm maximum each	Certificate of Exemption
S-605	Filter Aid Adsorption Day Hoppers (3), abated by A-619 and A-621 Dust Filters (3), 665 dscfm maximum each	Authority to Construct/ Permit to Operate
S-606	Spent Water Tank (at S-600 Pretreatment Unit), 98,100 gallons, abated by abated by A-598, Biofilter and A-599 Carbon Adsorption System	Authority to Construct/ Permit to Operate
S-607	Sulfuric Acid Tank (at S-600 Pretreatment Unit), 400 gallons	Certificate of Exemption
S-608	Citric Acid Tank (at S-600 Pretreatment Unit), 16,100 gallons	Certificate of Exemption
S-609	Sodium Hydroxide Tank (at S-600 Pretreatment Unit), 5160 gallons	Certificate of Exemption
S-610	Coagulant Tank (at S-600 Pretreatment Unit), 400 gallons	Certificate of Exemption
S-611	Polymer Tank (at S-600 Pretreatment Unit), 400 gallons	Certificate of Exemption
S-612	DAFs (2), 17,000 gallons each (at S-600 Pretreatment Unit), abated by A-622 and A-624 Biofilters and A-623 and A-625 Carbon Adsorption Systems	Authority to Construct/ Permit to Operate
S-613	Process Tanks (3), 4,700 gallons, 128,388 gallons and 528 gallons (at S-600 Pretreatment Unit), abated by A-622 and A-624 Biofilters and A-623 and A-625 Carbon Adsorption Systems	Authority to Construct/ Permit to Operate
S-614	Wet Surface Air Cooler (at S-600 Pretreatment Unit)	Certificate of Exemption
S-615	Evaporator (at S-600 Pretreatment Unit), abated by A-622 and A-624 Biofilters and A-623 and A-625 Carbon Adsorption Systems	Certificate of Exemption
S-616	Collection Tanks (2), 21,134 gallons each (at S-600 Pretreatment Unit)	Authority to Construct/ Permit to Operate
S-617	Renewable Feedstock Truck Unloading Operation	Certificate of Exemption
S-618	Sulfuric Acid Tank (at S-600 Pretreatment Unit), 400 gallons	Certificate of Exemption
S-619	Sulfiding Agent Vessel (at S-307 U240 UNICRACKING UNIT 240), 12,850 gallons	Certificate of Exemption
S-620	Sulfiding Agent Vessel (at S-307 U240 UNICRACKING UNIT 240), 12,850 gallons	Certificate of Exemption
S-621	Sulfiding Agent Vessel (at S-434 U246 High Pressure Reactor Train), 12,850 gallons	Certificate of Exemption
S-1007	U100-Dissolved Air Flotation Unit (with fixed roof), abated by: A-49 Thermal Oxidizer A-51 DAF Carbon Bed A-53 Thermal Oxidizer for S-324	Authority to Construct/ Permit to Operate

<b>Source/ Abatement Device No.</b>	<b>Source/Abatement Description</b>	<b>Requested Permit Action</b>
S-1008	U100_Primary Stormwater Basin	Authority to Construct/ Permit to Operate
S-1009	U100_Main Stormwater Basin	Authority to Construct/ Permit to Operate
S-1010	U235 Sulfur Recovery Unit, 200 long ton/day, abated by A-48 Sulfur Plant Tail Gas Treatment Plant	Authority to Construct/ Permit to Operate
S-32120	Tank 224, 110,000 bbls	Certificate of Exemption
A-598	Thermal Oxidizer (B-201 Main Burner, B-202 Reduction Furnace, B-203 Oxidation Furnace, B-204 Auxiliary Burner, and E-205 Waste Heat Boiler, 7.4 MMBtu/hr)	Authority to Construct/ Permit to Operate
A-599	SO2 Scrubber (D-211 Venturi, D-212 Caustic Scrubber, D-213 Cold Stack)	Authority to Construct/ Permit to Operate
A-600	Thermal Oxidizer (B-201 Main Burner, B-202 Reduction Furnace, B-203 Oxidation Furnace, B-204 Auxiliary Burner, and E-205 Waste Heat Boiler, 7.4 MMBtu/hr)	Authority to Construct/ Permit to Operate
A-601	SO2 Scrubber (D-211 Venturi, D-212 Caustic Scrubber, D-213 Cold Stack)	Authority to Construct/ Permit to Operate
A-606	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate
A-607	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate
A-608	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate
A-609	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate
A-610	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate
A-611	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate
A-612	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate
A-613	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate

<b>Source/ Abatement Device No.</b>	<b>Source/Abatement Description</b>	<b>Requested Permit Action</b>
A-614	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate
A-615	Venturi-Jet Dust Filter, Kice Model VR16-6H, 665 scfm or equivalent, 0.002 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate
A-616	Venturi-Jet Dust Filter, Kice Model VR16-6H, 665 scfm or equivalent, 0.002 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate
A-617	Venturi-Jet Dust Filter, Kice Model VR16-6H, 665 scfm or equivalent, 0.002 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate
A-618	Venturi-Jet Dust Filter, Kice Model VR16-6H, 665 scfm or equivalent, 0.002 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate
A-619	Venturi-Jet Dust Filter, Kice Model VR16-6H, 665 scfm or equivalent, 0.002 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate
A-620	Venturi-Jet Dust Filter, Kice Model VR16-6H, 665 scfm or equivalent, 0.002 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate
A-621	Venturi-Jet Dust Filter, Kice Model VR16-6H, 665 scfm or equivalent, 0.002 gr/dscf PM10 maximum	Authority to Construct/ Permit to Operate
A-622	Biofilter	Authority to Construct/ Permit to Operate
A-623	PTU FOG Carbon Adsorption, 2,200 scfm maximum	Authority to Construct/ Permit to Operate
A-624	Biofilter	Authority to Construct/ Permit to Operate
A-625	PTU FOG Carbon Adsorption, 2,200 scfm maximum	Authority to Construct/ Permit to Operate
A-626	Activated Carbon Vessel, 2 in parallel, while 2 are connected on standby	Authority to Construct/ Permit to Operate
A-627	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum, abating S-601 Bleaching Earth Storage Silos (12) (exempt per 2-1-115.1.4.4, loading/unloading material with moisture content greater than or equal to 5% wt)	Certificate of Exemption
A-628	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Certificate of Exemption
A-629	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Certificate of Exemption
A-630	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Certificate of Exemption

<b>Source/ Abatement Device No.</b>	<b>Source/Abatement Description</b>	<b>Requested Permit Action</b>
A-631	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Certificate of Exemption
A-632	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Certificate of Exemption
A-633	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Certificate of Exemption
A-634	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Certificate of Exemption
A-635	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Certificate of Exemption
A-636	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Certificate of Exemption
A-637	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Certificate of Exemption
A-638	Pulse Jet Dust House, Belgrade 330, 1600 scfm maximum or equivalent, 0.0015 gr/dscf PM10 maximum	Certificate of Exemption
A-639	Venturi-Jet Dust Filter, Kice Model VR16-6H, 665 scfm or equivalent, 0.002 gr/dscf PM10 maximum	Certificate of Exemption
A-640	Venturi-Jet Dust Filter, Kice Model VR16-6H, 665 scfm or equivalent, 0.002 gr/dscf PM10 maximum	Certificate of Exemption
A-641	Venturi-Jet Dust Filter, Kice Model VR16-6H, 665 scfm or equivalent, 0.002 gr/dscf PM10 maximum	Certificate of Exemption
A-642	Venturi-Jet Dust Filter, Kice Model VR16-6H, 665 scfm or equivalent, 0.002 gr/dscf PM10 maximum	Certificate of Exemption
A-643	Venturi-Jet Dust Filter, Kice Model VR16-6H, 665 scfm or equivalent, 0.002 gr/dscf PM10 maximum	Certificate of Exemption
A-644	Venturi-Jet Dust Filter, Kice Model VR16-6H, 665 scfm or equivalent, 0.002 gr/dscf PM10 maximum	Certificate of Exemption

The existing sources shown in Table 5 above will be demolished or shut down after startup of the Rodeo Renewed Project. Condition 27646 requires Phillips 66 to submit a Device Data Update Form (Form DDU) within 90 days of startup of any source included in the Rodeo Renewed Project to ensure that all sources used for CERCs to offset emissions increase for this project are permanently shut down and their permits surrendered.

## **10.0 Appendices**

Appendix A – Phillips 66 Fuel Gas System

Appendix B – Process Heaters Emissions Calculations

Appendix C – Summary of Storage Tanks Emissions Calculations

Appendix D – Fugitive Emissions Calculations

Appendix E – Marine Loading Operations Emissions Calculations

Appendix F – Wastewater Treatment System Emissions Calculations

Appendix G – Pretreatment Unit Emissions Calculations

Appendix H – Material Handling Emissions Calculations

Appendix I – Sour Water Strippers and Amine Acid Gas Treatment System Emissions Calculations

Appendix J – Regulation 2-5-114 (Limited Exemption- Modified Source with No Increase in Toxicity-Weighted Emissions) emissions calculations

Appendix K – Cooling Tower Emissions Calculations

Appendix L – Truck Fugitive Road Dust Emissions

Appendix M – Cumulative Increase

Appendix N – Contemporaneous Emission Reduction Credits Calculations

Appendix O – Marine Cargo Carrier Emissions

Appendix P – Statement of Compliance

Appendix Q – BACT Comparison Tables

Appendix R – Permit Conditions in Underline/Strikeout Format (to denote revisions since Public Notice version)

Appendix S – Federal Modification Test

Appendix T – Air District's CEQA Findings, Supporting Facts and Statement of Overriding Considerations

Appendix U – Responses to Public Comments

[E-signed by Jimmy Cheng](#)

Prepared by: Jimmy Cheng, Senior Air Quality Engineer

Date: 1/20/23