

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 1
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

PERMIT TO OPERATE
APPLICATION NOS. 479168, 502414 AND 513694

COMPANY NAME: Chevron Products Company

MAILING ADDRESS: 324 W. El Segundo Blvd.
El Segundo, CA 90245

EQUIPMENT LOCATION: 324 W. El Segundo Blvd.
El Segundo, CA 90245

BACKGROUND / PROJECT SUMMARY

The FCCU (P3S1), FCCU Air Pollution Control System (ESP and cyclones)(P3S4) and FCC Air Pollution Control Equipment (SCR)(P3S6) are currently operating under temporary permits to operate in Section H of Chevron’s RECLAIM/Title V Permit. Chevron has submitted change of condition applications for the FCCU and FCCU SCR. This document includes an evaluation of the subject change of condition applications and an evaluation for issuance of a regular permit to operate in Section D of the RECLAIM/Title V Permit for each of these permit units. The change of condition applications are summarized in the following paragraphs.

A/N 513694 for the FCCU - Permit condition S42.1 specifies catalyst additives that can be utilized in the FCCU regenerator. These additives fall into the following categories: NOx reduction additives, SOx reduction additives, performance optimizers and combustion (CO) promoters. According to the submittal for A/N 513694, Chevron has utilized a combustion promoter (Intercat COP-NP) and two performance optimizers (Intercat Pentacat and Intercat Super Z) that are not listed in the condition. Chevron requests that these three catalyst additives and eleven additional catalyst additives be added to permit condition S42.1. Chevron also requests that condition S42.1 be modified to provide the refinery flexibility to utilize catalyst additives that have no or low toxic air contaminant (TAC) content and are not specified in condition S42.1.

Chevron also requests that they be allowed to install a 3 inch air line from their refinery yard air system to the discharge line of the K-11 catalyst lift air compressor for the regenerator. This yard air will be utilized to provide lift of catalyst coming into the regenerator when the K-11 compressor is out of operation. Chevron currently uses steam to provide catalyst lift when the K-11 compressor is out of operation.

A/N 502414 for the FCCU SCR - Chevron installed a selective catalytic reduction system (SCR) on their existing fluid catalytic cracking unit (FCCU) regenerator under permit to construct AN 464423, which was issued in July 2007. The SCR was installed for compliance with the following NOx emission limits, which were imposed through a US EPA Consent Decree:

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 2
	APPL. NO. 502414, etc.	DATE 7/29/11
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- 20 ppmvd @ 0% O₂ on a 365 day rolling average
- 40 ppmvd @ 0% O₂ on a 7 day rolling average

The SCR was put into operation in March 2009. The catalyst is described in the permit as "BASF Model 1545/G/10, Monolith Ceramic Honeycomb". According to Chevron, the model number is incorrect since BASF does not make a model 1545. Chevron is requesting to change the catalyst description to BASF Honeycomb DeNOx Catalyst Type 04-85.

EQUIPMENT DESCRIPTION

The proposed permits to operate will be issued in Section D of the Chevron's RECLAIM/Title V Facility Permit. The equipment descriptions and permit conditions that will be included in the RECLAIM/Title V Facility Permit are contained in this section. In these proposed permit pages, new text is indicated by underline and deleted text is indicated by ~~strikeout~~. Permit conditions being modified are shown in parenthesis.

SECTION D: FACILITY DESCRIPTION AND EQUIPMENT SPECIFIC CONDITIONS

Description	ID No.	Connected To	RECLAIM Source Type	Emissions and Requirements	Conditions
Process 3: FLUID CATALYTIC CRACKING					P13.1
System 1: FCC UNIT					S7.4, S13.2, S15.7, S15.9, S15.10, S31.13, S31.16, S42.1
REGENERATOR, V-10, WITH 14 PAIRS OF 1 ST AND 2 ND STAGE INTERNAL CYCLONES, DIAMETER: 45 FT; HEIGHT: 62 FT 9 IN T-T; WITH INJECTOR, OPTIONAL OXYGEN ENRICHMENT A/N: 470768 <u>513694</u>	D203	C326 C327	NOx: Major Source; SOx: Major Source	CO: 500 PPMV (5A) [CONSENT DECREE CIVIL NO. C 03-04650-CRB, 6-27-2005]; CO: 500 PPMV (8A) [40CFR60 SUBPART J, 6-24-2008; 40CFR63 SUBPART UUU, #2, 4-20-2006]; CO: 2000 PPMV (5) [RULE 407, 4-2-1982] HAP: (10) [40CFR63 SUBPART UUU, #2, 4-20-2006]; NH3: 10 PPMV (5) [RULE 1105.1, 11-7-2003]; NOX: 20 PPMV (5A) [CONSENT DECREE CIVIL NO. C 03-04650-CRB, 6-27-2005]; NOX: 40 PPMV (5B) [CONSENT DECREE CIVIL NO. C 03-04650-CRB, 6-27-2005]; NOX: 231.8 LBS/HR (4) [RULE 2005, 4-20-2001; RULE 2005, 5-6-2005]; PM: (9) [RULE 404, 2-7-1986; RULE 405, 2-7-1986]; PM: 0.1 GRAINS/SCF (5) [RULE 409, 8-7-1981]; PM: 0.5 LBS/1000LB COKE BURNOFF(5A) [CONSENT DECREE CIVIL NO. C 03-04650-CRB, 6-27-2005]; PM: 2 LBS/TON COKE BURNOFF (8) [40CFR60 SUBPART J, 6-24-2008; 40CFR63 SUBPART UUU, #2, 4-20-2006]; PM: 2.8 LB/1000	A63.18, A63.22, (A195.8), (A195.9), A195.10, A195.11, A195.12, A195.13, A195.14, A229.4, A229.5, A229.6, A229.7, (D29.1), D29.10 , D82.4, (D82.10), D90.25, D323.2, D425.1 , E54.13, E57.6, H23.40, H23.42, K40.4, K171.19

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 3
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Description	ID No.	Connected To	RECLAIM Source Type	Emissions and Requirements	Conditions
				BBLS (5) [RULE 1105.1, 11-7-2003]; SO2: 25 PPMV (5A) [CONSENT DECREE CIVIL NO. C 03-04650-CRB, 6-27-2005]; SO2: 50 PPMV (5B) [CONSENT DECREE CIVIL NO. C 03-04650-CRB, 6-27-2005]; SOX: 122.2 LBS/HR (4) [RULE 2005, 4-20-2001]	
BLOWER, K-10, REGENERATOR AIR, WITH STEAM TURBINE DRIVE A/N: 470768	D3267				
BLOWER, K-10X, REGENERATOR AIR, MOTOR DRIVEN, 160,000 CFM, 22,500 BHP A/N: 470768	D4255	This compressor will not be installed.			
BLOWER, SPARE, REGENERATOR AIR, CONMEC, THREE STAGE AIR COMPRESSOR, WITH STEAM TURBINE DRIVE, 150,000 CFM, 13,138 BHP A/N: 470768 513694	D4071				
HEATER, REGENERATOR STARTUP F-10, REFINERY GAS, 125 MMBTU/ HR A/N: 470768 513694	D3973		NOX: Major Source**; SOX: Major Source**	CO: 2000 PPMV (5) [RULE 407, 4-2-1982] ; PM: 0.1 GRAINS/SCF (5) [RULE 409, 8-7-1981] ; PM: (9) [RULE 404, 2-7-1986]	B61.6 , D90.20 H23.2 , K171.19
REACTOR, R-20, HEIGHT: 124 FT 6 IN; DIAMETER: 22 FT 8 IN A/N: 470768 513694	D3116				B61.9 , C1.114
FRACTIONATOR, C-100, HEIGHT: 98 FT; DIAMETER: 22 FT A/N: 470768 513694	D212				K171.19
SCRUBBER, C-145, HEIGHT: 7 FT; DIAMETER: 6 FT 6 IN A/N: 470768	D213	Equipment Removed.			
ACCUMULATOR, V-100, FRACTIONATOR OVERHEAD, LENGTH: 46 FT; DIAMETER: 9 FT A/N: 470768 513694	D214				K171.19
COMPRESSOR, K-140, GAS, ELECTRIC MOTOR-DRIVEN WITH GEARBOX, DRY GAS SEAL VENTING TO A FUEL GAS SYSTEM A/N: 470768 513694	D3726				H23.19
COLUMN, PRIMARY ABSORBER, C-130A, HEIGHT: 89 FT 5 IN (T-T), DIAMETER: 9 FT A/N: 470768 513694	D4256				

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 4
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Description	ID No.	Connected To	RECLAIM Source Type	Emissions and Requirements	Conditions
COLUMN, STRIPPER, C-130B, HEIGHT: 94 FT 8 IN (T-T), DIAMETER: 14 FT A/N: 470768 513694	D4257				
FRACTIONATOR, WATER SEAL, V-101, HEIGHT: 30 FT; DIAMETER 3 FT A/N: 470768 513694	D215				
POT, SOUR WATER DRAW, V-132B, SERVING C-130B, DIAMETER 1 FT 6 IN, LENGTH: 6 FT (T-T) A/N: 470768 513694	D4258				
VESSEL, V-125, STEAM CONDENSATE, HEIGHT: 6 FT (T-T), DIAMETER 3 FT A/N: 470768 513694	D4259				
VESSEL, COKE STRAINER, V-102A, HEIGHT: 5 FT 6 IN; DIAMETER: 2 FT 6 IN A/N: 470768 513694	D216				
VESSEL, COKE STRAINER, V-102B, HEIGHT: 5 FT 6 IN; DIAMETER: 2 FT 6 IN A/N: 470768 513694	D217				
VESSEL, COKE COLLECTOR, V-103 A/N: 470768 513694	D218				
COMPRESSOR, K-140, TWO-STAGE A/N: 470768	D237	Replaced by new compressor K-140 (D3726).			
COLUMN, DEETHANIZER, C-130, HEIGHT: 101 FT; DIAMETER: 11 FT 6 IN A/N: 470768 513694	D258	Replaced by C-130A/B (D4256 & D4257).			
COLUMN, DEBUTANIZER, C-140, HEIGHT: 100 FT 6 IN; DIAMETER: 8 FT A/N: 470768 513694	D259				K171.19
ABSORBER, SPONGE, C-150, HEIGHT: 47 FT 6 IN; DIAMETER: 4 FT 6 IN A/N: 470768 513694	D260				
COLUMN, DEBUTANIZER, C-160, HEIGHT: 80 FT; DIAMETER: 8 FT A/N: 470768 513694	D261				
COLUMN, GASOLINE SPLITTER, C-170, HEIGHT: 54 FT; DIAMETER: 7 FT 6 IN A/N: 470768 513694	D262				
COLUMN, DEPROPANIZER, C-180, HEIGHT: 99 FT; DIAMETER: 3 FT 6 IN A/N: 470768 513694	D263				
COLUMN, DEPROPANIZER, C-190, HEIGHT: 117 FT 4 IN; DIAMETER: 6 FT A/N: 470768 513694	D264				K171.19

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 5
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Description	ID No.	Connected To	RECLAIM Source Type	Emissions and Requirements	Conditions
KNOCK OUT POT, V-132, SERVING C-130B, BOTTOMS SOUR WATER, HEIGHT: 4 FT; DIAMETER: 1 FT A/N: 470768 513694	D265				K171.19
ACCUMULATOR, V-141, DEBUTANIZER OVERHEAD, LENGTH: 18 FT; DIAMETER: 7 FT A/N: 470768 513694	D266				
VESSEL, DEETHANIZER FEED SEPARATOR, V-143, LENGTH: 34 FT; DIAMETER: 9 FT A/N: 470768 513694	D269				
ACCUMULATOR, V-160, DEBUTANIZER, HEIGHT: 12 FT; DIAMETER: 6 FT A/N: 470768 513694	D270				
POT, V-162, SOUR WATER, SERVING V-160, HEIGHT: 4 FT; DIAMETER: 1 FT A/N: 470768 513694	D1902				
ACCUMULATOR, V-170, SPLITTER, HEIGHT: 12 FT; DIAMETER: 6 FT 6 IN A/N: 470768 513694	D271				
POT, V-171, V-170 SOUR WATER, HEIGHT: 3 FT 6 IN; DIAMETER: 1 FT A/N: 470768 513694	D272				
ACCUMULATOR, V-180, DEPROPANIZER, HEIGHT: 12 FT; DIAMETER: 4 FT 6 IN A/N: 470768 513694	D273				
POT, V-182, SOUR WATER, HEIGHT: 4 FT; DIAMETER: 1 FT A/N: 470768 513694	D274				
ACCUMULATOR, V-190, DEPROPANIZER, HEIGHT: 20 FT; DIAMETER: 5 FT 6 IN A/N: 470768 513694	D275				
POT, V-192, SOUR WATER, HEIGHT: 4 FT; DIAMETER: 1 FT A/N: 470768 513694	D276				
VESSEL, ANTI-OXIDANT FEED, C-250, HEIGHT: 48 FT; DIAMETER: 7 FT A/N: 470768 513694	D312				
COLUMN, LIQUID CONTACTOR, C-260, HEIGHT: 37 FT; DIAMETER: 3 FT 6 IN A/N: 470768 513694	D313				
COLUMN, GASOLINE STRIPPER, C-270, HEIGHT: 25 FT 4 IN; DIAMETER: 5 FT A/N: 470768 513694	D314				

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 6
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Description	ID No.	Connected To	RECLAIM Source Type	Emissions and Requirements	Conditions
POT, V-43, WALNUT SHELL INJECTION, HEIGHT: 4 FT 4 IN; DIAMETER: 2 FT A/N: 470768 513694	D1903				
VESSEL, STRAINER, V-5, FEED, HEIGHT: 2 FT; DIAMETER: 1 FT 2 IN A/N: 470768 513694	D3117				
COLUMN, STRIPPER, C-110B, HEIGHT IS TANGENT TO TANGENT, HEIGHT: 17 FT 8 IN (T-T); DIAMETER: 6 FT 6 IN A/N: 470768 513694	D3265				
COLUMN, STRIPPER, C-111, HEAVY OIL, HEIGHT: 22 FT; DIAMETER: 5 FT 6 IN A/N: 470768 513694	D3266				
EJECTOR, PROPANE WATER EDUCTOR, K204A A/N: 470768 513694	D3269				
EJECTOR, PROPANE WATER EDUCTOR, K-204B A/N: 470768 513694	D3270				
EJECTOR, PROPANE WATER EDUCTOR, K-205A A/N: 470768 513694	D3271				
EJECTOR, PROPANE WATER EDUCTOR, K-205B A/N: 470768 513694	D3272				
VESSEL, SEPARATOR, V-15, WATER, LENGTH: 22 FT; DIAMETER: 5 FT A/N: 470768 513694	D3273				
KNOCK OUT POT, V-260, HEIGHT: 18 FT; DIAMETER: 5 FT A/N: 470768 513694	D3276				
DRUM, WASH, V-261, PROPANE WATER, HEIGHT: 12 FT; DIAMETER: 5 FT A/N: 470768 513694	D3277				
DRUM, TREATING, V-262, PROPANE CAUSTIC, HEIGHT: 12 FT; DIAMETER: 4 FT A/N: 470768 513694	D3278				
DRUM, TREATING, V-262A, PROPANE 2ND STAGE CAUSTIC, HEIGHT: 12 FT; DIAMETER: 4 FT A/N: 470768 513694	D3279				
DRUM, WASH, V-263, PROPANE WATER, HEIGHT: 16 FT; DIAMETER: 4 FT 6 IN A/N: 470768 513694	D3280				
DRUM, DEGASSING, V-273, CAUSTIC, HEIGHT: 12 FT; DIAMETER: 6 FT A/N: 470768 513694	D3281				

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 7
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Description	ID No.	Connected To	RECLAIM Source Type	Emissions and Requirements	Conditions
VESSEL, SETTLING, V-275, WATER/GASOLINE, HEIGHT: 8 FT; DIAMETER: 3 FT 4 IN A/N: 470768 513694	D3283				
DRUM, DEGASSING, V-290, PHENOLIC CAUSTIC, HEIGHT: 6 FT; DIAMETER: 3 FT A/N: 470768 513694	D3284	Equipment Removed.			
COLUMN, STRIPPER, C-110A, HEIGHT IS TANGENT TO TANGENT, HEIGHT: 18 FT 3 IN (T-T); DIAMETER: 5 FT 6 IN A/N: 470768 513694	D3832				
VESSEL, MAIN FRACTIONATOR COALESCER, V-120, DIAMETER: 5 FT; LENGTH: 36 FT S-S A/N: 470768 513694	D3971				K171.19
BLOWER, K-11, AIR LIFT, 400 HP ELECTRIC WITH STANDBY 3 INCH AIR LINE FROM REFINERY YARD AIR SYSTEM A/N: 470768 513694	D3972				K171.19
POT, V-132A, SERVING C-130A, WATER DRAW, DIAMETER: 1 FT 6 IN; LENGTH: 6 FT A/N: 470768 513694	D3974				K171.19
DRUM, INTERSTAGE KNOCKOUT, V-140, DIAMETER: 6 FT 6 IN; HEIGHT: 62 FT T-T A/N: 470768 513694	D3975				K171.19
POT, WATER KNOCKOUT, V-140A, DIAMETER: 1 FT; HEIGHT: 6 FT T-T A/N: 470768 513694	D3976				K171.19
VESSEL, CATALYST ADDITION, V-18, HEIGHT: 2 FT; DIAMETER: 1 FT A/N: 470768 513694	D3274				
VESSEL, CATALYST ADDITION, V-18A, HEIGHT: 3 FT; DIAMETER: 1 FT 6 IN A/N: 470768 513694	D3275				
VESSEL, CATALYST PROMOTER INJECTION, V-11A, HEIGHT: 4 FT; DIAMETER: 4 FT A/N: 470768 513694	D3865	Equipment Removed.			

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 8
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Description	ID No.	Connected To	RECLAIM Source Type	Emissions and Requirements	Conditions
VESSEL, CATALYST ADDITIVE, V-19, INTERCAT50 STYLE 4(A), 50 CU. FT., WITH INTERCAT STYLE 5 CYCLONE, HEIGHT: 10 FT 10. 75 IN. T-T, DIAMETER: 3 FT A/N: 470768 513694	D3285	C3983		PM: (9) [RULE 405, 2-7-1986]	D182.1 , K67. 22
FILTER, CARTRIDGE TYPE, INTERCAT STYLE 4, WITH AUTOMATIC PULSE JET CLEANING, PLEATED, CELLULOSE MATERIAL, 54 SQ. FT. SURFACE AREA, OUTER DIAMETER: 7. 94 IN; INNER DIAMETER : 3. 64 IN, LENGTH: 1 FT 4 IN A/N: 470768 513694	C3983	D3285		PM: (9) [RULE 404, 2-7-1986]	D322.2 , K67.45 <u>E71.72</u>
VESSEL, CATALYST ADDITIVE, V-19A, INTERCAT50 STYLE 4(A), 50 CU. FT. , WITH INTERCAT STYLE 5 CYCLONE, HEIGHT: 10 FT 10. 75 IN. T-T, DIAMETER: 3 FT A/N: 470768 513694	D3850	C3864			D182.1 , (K67.22)
FILTER, CARTRIDGE TYPE, INTERCAT STYLE 4, WITH AUTOMATIC PULSE JET CLEANING, PLEATED, CELLULOSE MATERIAL, 54 SQ. FT. SURFACE AREA, OUTER DIAMETER: 7. 94 IN; INNER DIAMETER : 3. 64 IN, LENGTH: 1 FT 4 IN A/N: 470768 513694	C3864	D3850		PM: (9) [RULE 404, 2-7-1986]	D322.2 , K67.45 <u>E71.72</u>
VESSEL, CATALYST ADDITIVE, V-19B, INTERCAT50 STYLE 4(A), 50 CU. FT. , WITH INTERCAT STYLE 5 CYCLONE, HEIGHT: 10 FT 10. 75 IN. T-T, DIAMETER: 3 FT A/N: 470768 513694	D3981	C3984		PM: (9) [RULE 405, 2-7-1986]	D182.1 , (K67.22) <u>E71.72</u>
FILTER, CARTRIDGE TYPE, INTERCAT STYLE 4, WITH AUTOMATIC PULSE JET CLEANING, PLEATED, CELLULOSE MATERIAL, 54 SQ. FT. SURFACE AREA, OUTER DIAMETER: 7. 94 IN; INNER DIAMETER : 3. 64 IN, LENGTH: 1 FT 4 IN A/N: 470768 513694	C3984	D3981		PM: (9) [RULE 404, 2-7-1986]	D322.2 , K67. 45

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 9
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Description	ID No.	Connected To	RECLAIM Source Type	Emissions and Requirements	Conditions
VESSEL, CATALYST ADDITIVE, V-19C, INTERCAT50 STYLE 4(A), 50 CU. FT., WITH INTERCAT STYLE 5 CYCLONE, HEIGHT: 10 FT 10.75 IN. T-T, DIAMETER: 3 FT A/N: 470768 513694	D3982	C3985		PM: (9) [RULE 405,2-7-1986]	D182.1, (K67.22) <u>E71.72</u>
FILTER, CARTRIDGE TYPE, INTERCAT STYLE 4, WITH AUTOMATIC PULSE JET CLEANING, PLEATED, CELLULOSE MATERIAL, 54 SQ.FT. SURFACE AREA, OUTER DIAMETER: 7.94 IN; INNER DIAMETER : 3.64 IN, LENGTH: 1 FT 4 IN A/N: 470768 513694	C3985	D3982		PM: (9) [RULE 404,2-7-1986]	D322.2, K67.45
FUGITIVE EMISSIONS, MISCELLANEOUS A/N: 470768 513694	D3583			HAP: (10) [40CFR 63 SUBPART CC, #5A, 6-23-2003]	H23. 19

Description	ID No.	Connected To	RECLAIM Source Type	Emissions and Requirements	Conditions
Process 3: FLUID CATALYTIC CRACKING					
System 4: FCC Air Pollution Control System <u>Equipment (ESPs and Cyclones)</u>					
ELECTROSTATIC PRECIPITATOR, K-60, RESEARCH-COTTRELL, 58 FT L. X 30 FT W. X 36 FT H. A/N: 479168	C1908	S329, C4200, C4201			C12. 1, (E71. 7), E102. 1
ELECTROSTATIC PRECIPITATOR, K-50, RESEARCH-COTTRELL, 58 FT- L X 30 FT W. X 36 FT H. A/N: 479168	C1909	S329, C4200, C4201			C12. 1, (E71. 7), E102. 1
CYCLONE, K-17A, SIX EXTERNAL, HEIGHT: 13 FT; DIAMETER: 4 FT 6 IN A/N: 479168	C326	D203, C4200, C4201, D4202			D401. 4
CYCLONE, K-17B, SIX EXTERNAL, HEIGHT: 13 FT; DIAMETER: 4 FT 6 IN A/N: 479168	C327	D203, C4200, C4201, D4202			D401. 4
STACK, HEIGHT: 87 FT 6 IN; DIAMETER: 8 FT A/N: 479168	S329	C1908, C1909, D4202			
FUGITIVE EMISSIONS, MISCELLANEOUS A/N: 479168	D3595				H23. 3
BLOWER, K-401, COMBUSTION AIR, WITH STEAM TURBINE DRIVE A/N: 479168	D3286	Equipment Removed. Regen air blowers are devices D3267 & D4071 (spare) in P3S1.			

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 10
	APPL. NO. 502414, etc.	DATE 7/29/11
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Description	ID No.	Connected To	RECLAIM Source Type	Emissions and Requirements	Conditions
BLOWER, K-51, PURGE AIR, WITH VARIABLE SPEED MOTOR DRIVE A/N: 479168	D3287				
BLOWER, K-51A, PENTHOUSE PURGE AIR, (SPARE TO K-51), WITH VARIABLE SPEED MOTOR DRIVE A/N: 479168	D3288				
BLOWER, K-61, PENTHOUSE PURGE AIR, WITH VARIABLE SPEED MOTOR DRIVE A/N: 479168	D3289				
BLOWER, K-61A, PENTHOUSE PURGE AIR, (SPARE TO K-61), WITH VARIABLE SPEED MOTOR DRIVE A/N: 479168	D3290				

Description	ID No.	Connected To	RECLAIM Source Type	Emissions and Requirements	Conditions
Process 3: FLUID CATALYTIC CRACKING					P13.1
System 6: FCC Air Pollution Control Equipment (SCR)					
SELECTIVE CATALYTIC REDUCTION, REACTOR #1, R-50, AQUEOUS NH3, BASF MODEL 1545/G/10, MONOLITH CERAMIC HONEYCOMB DENOX CATALYST TYPE 04-85 OR APPROVED EQUIVALENT CATALYST, 2,973.5 CU. FT. A/N: 478517 502414	C4200	C326 C327 C1908 C1909			D12.36, D12.37, E73.6, E193.5
SELECTIVE CATALYTIC REDUCTION, REACTOR #2, R-60, AQUEOUS NH3, BASF MODEL 1545/G/10, MONOLITH CERAMIC HONEYCOMB DENOX CATALYST TYPE 04-85 OR APPROVED EQUIVALENT CATALYST, 2,973.5 CU. FT. A/N: 478517 502414	C4201	C326 C327 C1908 C1909			D12.36, D12.37, E73.6, E193.5
DRUM, WATER SEAL, V-30, SCR SAFETY BYPASS, HEIGHT: 30 FT T/T, DIA: 12 FT, A/N: 478517 502414	D4202	C326 C327 S329			D12.38, K67.65
BLOWER, K-66A, SCR PURGE AIR, 200 HP A/N: 478517 502414	D4203				
BLOWER, K-66B, SCR PURGE AIR, 200 HP A/N: 478517 502414	D4204				

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 11
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

PROCESS CONDITIONS

P13.1 All devices under this process are subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
Benzene	40CFR61	Subpart FF

[**40CFR 61 Subpart FF, 12-4-2003**]

[Processes subject to this condition: 1, 2, **3**, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16]

SYSTEM CONDITIONS

S7.4 The following conditions shall apply to all refinery operation and related devices from this system:

The operator shall comply with all applicable mitigation measures stipulated in the "Statement of Findings, Statement of Overriding Considerations, and Mitigation Monitoring Plan" document which is part of the AQMD Certified Final Environmental Impact Report dated 09-May-2008 for this facility.

The operator shall maintain records in a manner approved by the District , to demonstrate compliance with the applicable measures stipulated in the "Statement of Findings, Statement of Overriding Considerations, and Mitigation Monitoring Plan" document.

[CA PRC CEQA, 11-23-1970]

[Systems subject to this condition: **Process 3, System 1**; Process 7, System 4; Process 12, System 28; Process 13, System 10, 11, 12 , 13; Process 20, System 7 , 10 , 31]

Note: There are not any post construction requirements for the FCCU in this document.

S13.2 All devices under this system are subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
VOC	District Rule	1123

RULE 1123, 12-7-1990]

[Systems subject to this condition : Process 1, System 3, 5, 13, 17; Process 2, System 1, 5, 6; **Process 3, System 1** , 5; Process 4, System 1, 3, 5, 7, 9, 11, 13; Process 5, System 1; Process 6, System 4; Process 7, System 2, 4, 7; Process 8, System 1, 2, 5, 7, 8, 10; Process 9, System 1, 2; Process 10, System 1 , 4; Process 12, System 2, 4, 7, 9, 10, 11, 12, 13, 16, 17, 18, 22, 26, 27, 28; Process 20, System 3, 7, 10, 11, 12, 14, 18, 19, 23; Process 21, System 13, 14, 16, 18]

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 12
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

S15.7 The vent gases from all affected devices of this process/system shall be vented as follows:

All emergency vent gases shall be directed to a vapor recovery system and/or flare system except Devices IDs D15, D3195, D3199, D3200 (Process 1, System 3), D106 (Process 1, System 13), D3574, D3371, D3373, D591, D595, D597, D3372, D592, D598 & D602 (Process 6, System 4) that vent to the atmosphere.

This process/system shall not be operated unless the vapor recovery system and/or flare system is in full use and has a valid permit to receive vent gases from this system.

[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(b)(2)-Offset, 5-10-1996]

[Systems subject to this condition : Process 1, System 3, 5, 13, 17; Process 2, System 1; **Process 3, System 1**, 5; Process 4, System 1, 3, 5, 7, 9, 11, 13; Process 5, System 1; Process 6, System 4; Process 7, System 4, 7; Process 8, System 1, 2, 5, 7, 8, 10; Process 9, System 1, 2; Process 10, System 1; Process 12, System 2, 7, 9, 11, 13, 17, 22, 23, 25, 26, 27; Process 20, System 18, 19; Process 21, System 18]

S15.9 The vent gases from all affected devices of this process/system shall be vented as follows:

All sour gases shall be directed to the sour gas treating unit(s).

This process/system shall not be operated unless the sour gas treating unit(s) is in full use and has a valid permit to receive vent gases from this system.

[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(b)(2)-Offset, 5-10-1996]

[Systems subject to this condition : Process 1, System 3, 5, 13; Process 2, System 1; **Process 3, System 1**; Process 4, System 1, 3, 7, 9, 11, 13; Process 7, System 4; Process 8, System 1; Process 10, System 1; Process 12, System 7; Process 20, System 4, 10, 28, 29, 30, 37]

S15.10 The vent gases from all affected devices of this process/system shall be vented as follows:

All vent gases under normal operating conditions shall be directed to the vapor recovery system.

This process/system shall not be operated unless the vapor recovery system(s) is in full use and has a valid permit to receive vent gases from this system.

[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(b)(2)-Offset, 5-10-1996]

[Systems subject to this condition : Process 1, System 3, 5, 13, 17; Process 2, System 1; **Process 3, System 1**, 5; Process 4, System 1, 3, 5, 7, 9, 1, 13; Process 5, System 1; Process 6, System 4; Process 7, System 4, 7; Process 8, System 1, 2, 5, 7, 8, 10; Process 9, System 1, 2; Process 10, System 1; Process 12, System 2, 7, 9, 11, 13, 17, 22, 23, 25, 26, 27; Process 20, System 18; Process 21, System 18]

S31.13 The following BACT requirements shall apply to VOC service fugitive components associated with the devices that are covered by application number(s) 308571, 318507, and 377967:

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 13
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

All new components in VOC service as defined in Rule 1173, except valves and flanges, shall be inspected quarterly using EPA reference Method 21. All new valves and flanges in VOC service, except those specifically exempted by Rule 1173, shall be inspected monthly using EPA Method 21.

If 98.0 percent or greater of the new (non-bellows seal) valves and the new flange population inspected is found to leak gaseous or liquid volatile organic compounds at a rate less than 500 ppmv for two consecutive months, then the operator may change to a quarterly inspection program with the approval of the District.

The operator shall revert from quarterly to monthly inspection program if less than 98.0 percent of the new (non-bellows seal) valves and the new flange population inspected is found to leak gaseous or liquid volatile organic compounds at a rate less than 500 ppmv.

All new components in VOC service with a leak greater than 500 ppmv but less than 1,000 ppmv, as methane, measured above background using EPA Method 21 shall be repaired within 14 days of detection. Components shall be defined as any valve, fitting, pump, compressor, pressure relief valve, diaphragm, hatch, sight-glass, and meter, which are not exempted by Rule 1173.

The operator shall keep records of the monthly inspection (quarterly where applicable), subsequent repair, and reinspection, in a manner approved by the District. Records shall be kept and maintained for at least two years, and shall be made available to the Executive Officer or his authorized representative upon request.

[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(b)(2)-Offset, 5-10-1996]

[Systems subject to this condition: [Process 3, System 1](#); Process 5, System 1]

S31.16 The following BACT requirements shall apply to VOC service fugitive components associated with the devices that are covered by application number(s) 410240, 411356, 411357, 412024, 414153, 414154, 414157, 414158, 421106, 422682, 427936, 454408 & 456768:

The operator shall provide to the District, no later than 60 days after initial startup, a recalculation of the fugitive emissions based on actual components installed and removed from service. The valves and flanges shall be categorized by size and service. The operator shall submit a listing of all new non-bellows seal valves which shall be categorized by tag no., size, type, operating temperature, operating pressure, body material, application, and reasons why bellows seal valves were not used.

All new valves in VOC service, except those specifically exempted by Rule 1173 and those in heavy liquid service as defined in Rule 1173, shall be bellows seal valves, except as approved by the District, in the following applications: heavy liquid service, control valve, instrument piping/tubing, applications requiring torsional valve stem motion, applications where valve failure could pose safety hazard (e.g., drain valves with valve stems in horizontal position), retrofits/special applications with space limitations, and valves not commercially available.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 14
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

All new valves and major components in VOC service as defined by Rule 1173, except those specifically exempted by Rule 1173 and those in heavy liquid service as defined in Rule 1173, shall be distinctly identified from other components through their tag numbers (e.g., numbers ending in the letter "N"), and shall be noted in the records.

All new components in VOC service as defined in Rule 1173, except valves and flanges, shall be inspected quarterly using EPA reference Method 21. All new valves and flanges in VOC service, except those specifically exempted by Rule 1173, shall be inspected monthly using EPA Method 21.

If 98.0 percent or greater of the new (non-bellows seal) valves and the new flange population inspected is found to leak gaseous or liquid volatile organic compounds at a rate less than 500 ppmv for two consecutive months, then the operator may change to a quarterly inspection program with the approval of the District.

The operator shall revert from quarterly to monthly inspection program if less than 98.0 percent of the new (non-bellows seal) valves and the new flange population inspected is found to leak gaseous or liquid volatile organic compounds at a rate less than 500 ppmv.

All new components in VOC service with a leak greater than 500 ppmv but less than 1,000 ppmv, as methane, measured above background using EPA Method 21 shall be repaired within 14 days of detection. Components shall be defined as any valve, fitting, pump, compressor, pressure relief valve, diaphragm, hatch, sight-glass, and meter, which are not exempted by Rule 1173.

The operator shall keep records of the monthly inspection (quarterly where applicable), subsequent repair, and reinspection, in a manner approved by the District. Records shall be kept and maintained for at least two years, and shall be made available to the Executive Officer or his authorized representative upon request. Once Title V permit is issued, records shall be maintained for five years.

[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(b)(2)-Offset, 5-10-1996]

[Systems subject to this condition : **Process 3, System 1**; Process 5, System 1; Process 7, System 4; Process 8, System 10; Process 12, System 2, 9, 11, 26; Process 20, System 31; Process 21, System 13]

~~**S42.1**—The operator shall only use the following catalyst emission control and process optimization additives in this process system:~~

MFTR/BRAND	PRODUCT
Akzo	KDNOX / KDNOX 2001
Akzo	KDSOX
Akzo	KDSOX 2002
Akzo	SOxDOWN
Albemarle	CRACKING METAL TRAP
Albemarle	ZSM
<u>Albemarle</u>	<u>DuraSOx</u>

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 15
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Englehard	1200 SERIES
Englehard	2000 SERIES
Englehard	CLEANOX
Englehard	COCAT
Englehard	CONVERTOR
Englehard	EZ FLOW
Englehard	OXYCLEAN
Englehard	PROCAT
Englehard	SELECT Z SERIES
Englehard	SOXCAT
Englehard	SOXCAT EXTRA
Englehard	X-65
Englehard	X-12 GRADE
Englehard	X-GRADES
Englehard	USP SERIES CO PROMOTER
Intereat	NOXGETTER (TYPE A & B)
Intereat	SOXGETTER / SUPER SOXGETTER
Intereat	SOXGETTER LC / SUPER SOXGETTER LC
Intereat	SUPER SOXGETTER / SUPER SOXGETTER HD
Intereat	ULTRA LO SOX
W. R. Grace	DENOx Additive
W. R. Grace	DESOx Additive
W. R. Grace	LOBO
W. R. Grace	OLEFINS MAX
W. R. Grace	Olefins Plus
W. R. Grace	SUPER DESOX

~~[RULE 1303(b)(2) Offset, 5-10-1996; RULE 1401, 6-15-2001 9-10-10]~~

~~[Systems subject to this condition: [Process 3, System 1](#)]~~

Note: This condition will be replaced by Condition E71.72, which will be imposed on the catalyst additive loaders (D3285, D3850, D3981 and D3982).

DEVICE CONDITIONS:

A63.18 The operator shall limit emissions from this equipment as follows:

Contaminant	Emissions Limit
CO	Less than or equal to 8085 lbs in any one day

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 16
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

For compliance determination purposes, CO emissions shall be calculated based on certified continuous monitor, which shall have the capability to show cumulative daily emissions.

[**RULE 1303(b)(2)-Offset, 5-10-1996**]

[Devices subject to this condition: **D203**]

A63.22 The operator shall limit emissions from this equipment as follows:

Contaminant	Emissions Limit
VOC	Less than or equal to 126.5 lbs in any one day

[**RULE 1303(b)(2)-Offset, 5-10-1996**]

[Devices subject to this condition: **D203**]

A195.8 The 20 PPM NOX emission limit(s) is averaged over 365 rolling days at 0% O2, dry basis.

~~The 20 ppmv emission limit shall become effective on December 31, 2008.~~

[**CONSENT DECREE CIVIL NO. C 03-04650 CRABS, 6-27-2005**]

[Devices subject to this condition: **D203**]

A195.9 The 40 PPM NOX emission limit(s) is averaged over 7 rolling days at 0% O2, dry basis.

~~The 40 ppmv emission limit shall become effective on December 31, 2008.~~

NOx emissions during period of Startup, Shutdown, or Malfunction shall not be used in determining compliance with this emissions limit, provided that during such periods Chevron implements good air pollution control practices to minimize NOx emissions.

[**CONSENT DECREE CIVIL NO. C 03-04650 CRABS, 6-27-2005**]

[Devices subject to this condition: **D203**]

A195.10 The 25 PPM SO2 emission limit(s) is averaged over 365 rolling days at 0% O2, dry basis.

[**CONSENT DECREE CIVIL NO. C 03-04650 CRABS, 6-27-2005**]

[Devices subject to this condition: **D203**]

A195.11 The 50 PPM SO2 emission limit(s) is averaged over 7 rolling days at 0% O2, dry basis.

SO2 emissions during period of Startup, Shutdown, or Malfunction shall not be used in determining compliance with this emissions limit, provided that during such periods Chevron implements good air pollution control practices to minimize SO2 emissions.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 17
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

[**CONSENT DECREE CIVIL NO. C 03-04650 CRABS, 6-27-2005**]

[Devices subject to this condition: **D203**]

A195.12 The 500 PPM CO emission limit(s) is averaged over 1 hour at 0% O₂, dry basis.

CO emissions during period of Startup, Shutdown, or Malfunction shall not be used in determining compliance with this emissions limit, provided that during such periods Chevron implements good air pollution control practices to minimize CO emissions.

[**CONSENT DECREE CIVIL NO. C 03-04650 CRABS, 6-27-2005**]

[Devices subject to this condition: **D203**]

A195.13 The 500 PPM CO emission limit(s) is averaged over 1 hour as measured (no O₂ correction) on a dry basis.

[**40CFR 60 Subpart J, 6-24-2008; 40CFR 63 Subpart UUU, 4-20-2006**]

[Devices subject to this condition: **D203**]

A195.14 The 0.5 LBS/1000 LBS OF COKE BURNED PM emission limit(s) is averaged over 3 hours.

EPA Method 5B or 5F shall be utilized to demonstrate compliance with the subject PM emission limit

PM emissions during period of Startup, Shutdown, or Malfunction shall not be used in determining compliance with this emissions limit, provided that during such periods Chevron implements good air pollution control practices to minimize PM emissions.

[**CONSENT DECREE CIVIL NO. C 03-04650 CRABS, 6-27-2005**]

[Devices subject to this condition: **D203**]

A229.4 The 122.2 LBS/HR emission limit is measured by the use of certified SO_x CEMS.

The mass emission limit is solely for the purpose of ensuring that there is no net increase in emission of SO_x that will trigger BACT requirement pursuant to Rule 2005(c)(1)(A).

[**RULE 2005, 4-20-2001; RULE 2005, 5-6-2005**]

[Devices subject to this condition: **D203**]

A229.5 The 231.8 LBS/HR emission limit is measured by the use of certified NO_x CEMS.

The mass emission limit is solely for the purpose of ensuring that there is no net increase in emission of NO_x that will trigger BACT requirement pursuant to Rule 2005(c)(1)(A).

[**RULE 2005, 4-20-2001; RULE 2005, 5-6-2005**]

[Devices subject to this condition: **D203**]

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 18
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

A229.6 The 500 PPM emission limit is measured by at least three one-hour source tests using District-approved method(s). This compliance test shall be done on a quarterly basis but may be substituted with certified CO CEMS data.

[**RULE 1303(a)(1)-BACT, 5-10-1996; 40CFR 63 Subpart UUU, 4-20-2006**]

[Devices subject to this condition: **D203**]

A229.7 The 10 PPM emission limit is measured by at least three one-hour source tests using District-approved method(s). This compliance test shall be done on a quarterly basis but may be substituted with certified NH3 CEMS data.

[**RULE 1105.1, 11-7-2003; RULE 1303(a)(1)-BACT, 5-10-1996**]

[Devices subject to this condition: **D203**]

B61.6 The operator shall not use fuel gas, except uncombined natural gas, containing the following specified compounds:

Compound	PPM by Volume
H2S	Greater than 160

The H2S concentration limit shall be based on a rolling 3-hour averaging period

[**40CFR 60 Subpart J, 6-24-2008**]

[Devices subject to this condition: D84, D471, D472, D473, D641, D643, D2198, D2199, D2207, D2208, D2216, D3031, D3054, C3148, D3530, C3805, C3806, **D3973**]

B61.9 The operator shall not use fresh feed containing the following specified compounds:

Compound	Weight Percent
Sulfur	Greater than 0.3

The 0.3 weight percent sulfur limit for the fresh feed shall be based on a seven day rolling average.

[**40CFR 60 Subpart J, 6-24-2008**]

[Devices subject to this condition: **D3116**]

C1.114 The operator shall limit the throughput to no more than 74,000 barrel(s) in any one day.

The operator shall properly maintain and operate the existing throughput measuring and recording device to show compliance with this limit.

The operator shall maintain records in a manner approved by the District, to demonstrate compliance with this condition.

[**RULE 1105.1, 11-7-2003; RULE 1303(b)(2)-Offset, 5-10-1996**]

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 19
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

[Devices subject to this condition: [D3116](#)]

C12.1 The operator shall use this equipment in such a manner that the ESP daily average voltage and secondary current (or total power input) being monitored as indicated below are greater than or equal to the average value in the most recent source test at the outlet of the FCCU Regenerator exhaust stack that demonstrated compliance with the emission limits.

The operator shall install and maintain a continuous monitoring and recording system to accurately measure and record the:

1. voltage
2. current

at each ESP field. In addition, the operator shall keep records, in a manner approved by the District, for each of these parameters.

If the daily average ESP total power input falls below the level measured in the most recent source test at the outlet of the FCCU Regenerator exhaust stack that demonstrated compliance with the emission limit, a source test at the FCCU Regenerator stack shall be performed within 90 days at the new minimum daily average ESP total power level. The source test shall be performed according to the requirements specified in Permit Condition D29.1

[RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997; RULE 401, 3-2-1984; RULE 404, 2-7-1986; RULE 405, 2-7-1986; 40CFR 60 Subpart J, 6-24-2008]

[Devices subject to this condition: [C1908](#), [C1909](#)]

D12.36 The operator shall install and maintain a temperature reading device to accurately indicate the temperature of the flue gas at the inlet to the SCR catalyst.

[Rule 1303, 12-6-2002]

[Devices subject to this condition: [C4200](#), [C4201](#)]

D12.37 The operator shall install and maintain a differential pressure gauge to accurately indicate the differential pressure across the SCR catalyst bed. The gauge shall be used as an indicator of the catalyst bed becoming plugged.

[Rule 1303, 12-6-2002]

[Devices subject to this condition: [C4200](#), [C4201](#)]

D12.38 The operator shall install and maintain a(n) measuring device to accurately indicate the water level of the seal.

[Rule 1303, 12-6-2002]

[Devices subject to this condition: [D4202](#)]

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 20
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

D29.1 The operator shall conduct source test(s) for the pollutant(s) identified below.

Pollutant(s) to be tested	Required Test Method(s)	Averaging Time	Test Location
Total PM	<u>District Method 5.2 Modified</u>	<u>District-approved averaging time</u>	<u>Stack Outlet</u>
Solid PM	<u>District Method 5.2 Modified</u>	<u>District-approved averaging time</u>	<u>Stack Outlet</u>
Total PM10	<u>District Method 5.2 Modified</u>	<u>District-approved averaging time</u>	<u>Stack Outlet</u>
Filterable PM10	<u>District Method 5.2 Modified</u>	<u>District-approved averaging time</u>	<u>Stack Outlet</u>
NH3 emissions	<u>District Method 207.1</u>	<u>District-approved averaging time</u>	<u>Stack Outlet</u>
VOC	<u>District Method 25.1 or 25.3</u>	<u>District-approved averaging time</u>	<u>Stack Outlet</u>

At least three sample runs shall be conducted for each of the tests above.

The test(s) shall be conducted every year after initial source test(s). Approved CEMS data may be substituted for required source test.

The test shall be conducted when the equipment is operating under normal conditions.

The PM10 emissions shall be expressed as grains of PM per standard cubic foot of exhaust effluent.

The PM10 emissions shall also be expressed as pounds per 1000 barrels of fresh feed.

The PM10 emissions shall also be expressed as pounds per ton of coke burn-off.

The exhaust flow rate shall be included and expressed in standard cubic feet per minute.

The ammonia emissions as measured from the in-stack CEMS shall be simultaneously recorded during the source test.

The NH3 emissions shall be expressed in parts per million by volume dry corrected to 3% O2.

Source test results shall include the following parameters: FCCU feed rate; catalyst recirculation rate; catalyst inventory in the equipment; fresh catalyst feed; coke burn rate; oxygen content of exhaust gases; exhaust flow rate; exhaust gas moisture content; the flue gas temperature at the outlet of the ESP; ammonia injection rate prior to the ESPs and the average current, voltage, and spark rate at each ESP field in use.

[RULE 1303(b)(2)-Offset, 5-10-1996; RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997; RULE 404, 2-7-1986; RULE 405, 2-7-1986; 40CFR 60 Subpart J, 6-24-2008]

[Devices subject to this condition: **D203**]

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 21
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Note: Chevron has performed this source test annually as required.

D29.10 The operator shall conduct source test(s) for the pollutant(s) identified below:

Pollutant(s) to be tested	Required Test Method(s)	Averaging Time	Test Location
PM10 emissions	Approved District Method(s)	District-approved averaging time	Outlet
NH3 emissions	Approved District Method(s)	District-approved averaging time	Outlet

The test shall be conducted after AQMD approval of the source test protocol, but no later than 180 days after the initial start-up of the SCR system. The AQMD shall be notified of the date and time of the test at least 10 days prior to the test.

The test shall be conducted when this equipment is operating at 90 percent or greater of its permitted throughput limit.

The PM10 emissions shall be expressed as grains of PM per standard cubic foot of exhaust effluent.

The PM10 emissions shall also be expressed as pounds per 1000 barrels of fresh feed.

The PM10 emissions shall also be expressed as pounds per ton of coke burn-off.

The exhaust flow rate shall be included and expressed in standard cubic feet per minute.

The NH3 emissions shall be expressed in parts per million by volume dry corrected to 3% O2.

Source test results shall also include the following parameters: FCCU feed rate; oxygen content of exhaust gases; exhaust flow rate; exhaust gas moisture content; the flue gas temperature at the stack.

The ammonia emissions as measured from the in-stack CEMS shall be simultaneously recorded during the source test.

~~[RULE 1105.1, 11-7-2003; RULE 1303, 12-6-2002; RULE 404, 2-7-1986; RULE 409, 8-7-1981; 40CFR 60 Subpart J, 6-24-2008]~~

~~[Devices subject to this condition: [D203](#)]~~

Note: This one-time source test has been completed and the test reported was submitted as required.

D82.4 The operator shall install and maintain a CEMS to measure the following parameters:

CO concentration in ppmv

Concentrations shall be corrected to 3 percent oxygen on a dry basis.

Oxygen concentration in percent volume

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 22
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

The CEMS shall be installed to continuously record the actual stack concentration and the corrected stack concentration for CO along with the stack O2 concentration. The monitoring system shall comply with the requirements of District Rule 218.

[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997; RULE 407, 4-2-1982]

[Devices subject to this condition: **D203**, D2216, D3530]

D82.10 The operator shall install and maintain a CEMS to measure the following parameters:

NH3 concentration in ppmv

Concentrations shall be corrected to 3 percent oxygen on a dry basis.

The CEMS shall be installed and maintained to continuously record the parameter being measured.

~~The CEMS shall be installed after consultation with the SCAQMD on the appropriate CEMS. The operator shall submit to the SCAQMD at least 60 days prior to the installation of the CEMS but not later than 30 days from initial startup of the equipment, a CEMS application proposal and a Quality Control and Performance Evaluation plan for the operation of the CEMS.~~

The CEMS shall be installed and shall be accurate to within plus or minus 20 percent relative accuracy or some other relative accuracy limit as determined by the Executive Officer to be appropriate for this CEMS. It shall be calibrated at least once every 12 months or as outlined in the Quality Control and Performance Evaluation plan.

[RULE 1303(a)(1)-BACT, 5-10-1996]

[Devices subject to this condition: **D203**]

Note: Chevron submitted the specified CEMS application and Quality Control/ Performance Evaluation Plan.

D90.20 The operator shall continuously monitor the H2S concentration in fuel gases before being burned in this device according to the following specifications:

The operator shall use Gas Chromatograph meeting the requirements of 40CFR60 Subpart J to monitor the parameter.

The operator shall also install and maintain a device to continuously record the parameter being monitored.

The operator may monitor the H2S concentration at a single location for fuel combustion devices, if monitoring at this location accurately represents the concentration of H2S in the fuel gas being burned in this device.

[40CFR 60 Subpart J, 6-24-2008]

[Devices subject to this condition: D84, D471, D472, D473, D641, D643, D2198, D2199, D2207, D2208, D2216, D3031, D3054, D3530, D3695, D3778, **D3973**]

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 23
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

D90.25 The operator shall continuously monitor the opacity at the stack according to the following specifications:

The operator shall maintain and operate the opacity meter and record the readings as required pursuant to 40CFR60, Subpart J and 40CFR63, Subpart UUU at all times except during periods of required maintenance and malfunction of the opacity meter.

[RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997; RULE 401, 3-2-1984; 40CFR 60 Subpart J, 6-24-2008; 40CFR 63 Subpart UUU, 4-20-2006]

[Devices subject to this condition: **D203**]

D182.1 The operator shall test this equipment in accordance with the following specifications:

The operator shall conduct an inspection for visible emissions from all stacks and other emission points of this equipment whenever there is a public complaint of visible emissions, whenever visible emissions are observed, and during each filling operation of the catalyst additive vessel. The inspection during the filling operation shall be conducted during daylight hours.

If any visible emissions (not including condensed water vapor) are detected, the operator shall take corrective action(s) that eliminates the visible emissions within 24 hours and report the visible emissions as a potential deviation in accordance with the reporting requirements in Section K of this permit.

The operator shall keep records in accordance with the recordkeeping requirements in Section K of this permit and the following records:

- 1.) Stack or emission point identification;
- 2.) Description of any corrective actions taken to abate visible emissions; and
- 3.) Date and time visible emission was abated.

[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997; RULE 401, 3-2-1984]

[Devices subject to this condition: **D3285, D3850, D3981, D3982**]

D322.2 The operator shall perform annual inspection of the equipment and filter media for leaks, broken or torn filter media, and improperly installed filter media.

[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997; RULE 401, 3-2-1984]

[Devices subject to this condition: C3864, **C3983, C3984, C3985**]

D323.1 The operator shall conduct an inspection for visible emissions from all stacks and other emission points of this equipment whenever there is a public complaint of visible emissions, whenever visible emissions are observed, and on an annual basis, at least, unless the equipment did not operate during the entire annual period. The routine annual inspection shall be conducted while the equipment is in operation and during daylight hours.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 24
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

If any visible emissions (not including condensed water vapor) are detected that last more than three minutes in any one hour, the operator shall verify and certify within 24 hours that the equipment causing the emission and any associated air pollution control equipment are operating normally according to their design and standard procedures and under the same conditions under which compliance was achieved in the past, and either:

- 1). Take corrective action(s) that eliminates the visible emissions within 24 hours and report the visible emissions as a potential deviation in accordance with the reporting requirements in Section K of this permit; or
- 2). Have a CARB-certified smoke reader determine compliance with the opacity standard, using EPA Method 9 or the procedures in the CARB manual "Visible Emission Evaluation", within three business days and report any deviations to AQMD.

The operator shall keep the records in accordance with the recordkeeping requirements in Section K of this permit and the following records:

- 1). Stack or emission point identification;
- 2). Description of any corrective actions taken to abate visible emissions;
- 3). Date and time visible emission was abated; and
- 4). All visible emission observation records by operator or a certified smoke reader.

[RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997; RULE 401, 3-2-1984]

[Devices subject to this condition: D166, D167, D168, D169, D170, D171, D172, D173, D174, D175, D176, D177, D178, D179, D180, D182, D183, D317, D318, D319, D320, D323, **C326, C327**, D1905, D3285, D3549, D3550, D3554, D3559, D3571, D3865]

D323.2 The operator shall conduct an inspection for visible emissions from all stacks and other emission points of this equipment whenever there is a public complaint of visible emissions, whenever visible emissions are observed, and on a semiannual basis, at least, unless the equipment did not operate during the entire semiannual period. The routine semiannual inspection shall be conducted while the equipment is in operation and during daylight hours.

If any visible emissions (not including condensed water vapor) are detected that last more than three minutes in any one hour, the operator shall verify and certify within 24 hours that the equipment causing the emission and any associated air pollution control equipment are operating normally according to their design and standard procedures and under the same conditions under which compliance was achieved in the past, and either:

- 1). Take corrective action(s) that eliminates the visible emissions within 24 hours and report the visible emissions as a potential deviation in accordance with the reporting requirements in Section K of this permit; or
- 2). Have a CARB-certified smoke reader determine compliance with the opacity standard, using EPA Method 9 or the procedures in the CARB manual "Visible

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 25
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Emission Evaluation", within three business days and report any deviations to AQMD.

The operator shall keep the records in accordance with the recordkeeping requirements in Section K of this permit and the following records:

- 1). Stack or emission point identification;
- 2). Description of any corrective actions taken to abate visible emissions;
- 3). Date and time visible emission was abated; and
- 4). All visible emission observation records by operator or a certified smoke reader.

[RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997; RULE 401, 3-2-1984]

[Devices subject to this condition: **D203**, C1746, C1749, C1757, C1785, C3012]

~~**D425.1** The operator shall have the existing NO_x CEMS monitoring this device reevaluated by the District by submitting a CEMS application. If the CEMS is not re-certified within 90 days of start up of this device, the facility permit holder shall calculate and report NO_x emissions in accordance with Rule 2012, Appendix A, Chapter 2, Paragraph(B)(16) Recertification Requirements.~~

~~**[RULE 2012, 5-6-2005]**~~

~~[Devices subject to this condition: **D203**]~~

Note: The NO_x CEMS has been recertified.

E54.13 The operator is not required to vent this equipment to the following equipment if all of the requirements listed below are met:

DEVICE ID C4200 [SELECTIVE CATALYTIC REDUCTION]

DEVICE ID C4201 [SELECTIVE CATALYTIC REDUCTION]

Requirement number 1: The equipment is experiencing a startup, shutdown or malfunction.

[CONSENT DECREE CIVIL NO. C 03-04650 CRABS, 6-27-2005]

[Devices subject to this condition: **D203**]

E57.6 The operator shall vent this equipment to either one of the SCR reactors (C4200 or C4201) connected to the FCC, whenever the FCC is in normal operation.

[CONSENT DECREE CIVIL NO. C 03-04650 CRABS, 6-27-2005]

[Devices subject to this condition: **D203**]

E71.7 The operator shall only operate this equipment using a minimum of ten (10) (out of 16 total) electrostatic precipitator (ESP) electrical grids energized in one (1) ESP and make the necessary operating adjustments to ensure compliance with the applicable emission limits of District Rules 404 and 405. Operating adjustments shall include

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 26
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

changes to the voltage and/or amperage at the operational grids to maintain sufficient particulate capture efficiency.

[RULE 404, 2-7-1986; RULE 405, 2-7-1986]

[Devices subject to this condition: [C1908](#), [C1909](#)]

E71.72 The operator shall not use in this equipment any material containing any toxic air contaminants (TACs) identified in the SCAQMD Rule 1401, as amended on or after 09/20/2010, with the exception of copper compounds (CAS No. 7440-50-8) or Vanadium Pentoxide (CAS No. 1314-62-1).

The operator may use material that contains up to 20 wt. percent Copper Compounds (CAS No. 7440-50-8) or 10 wt. percent Vanadium Pentoxide (CAS No. 1314-62-1).

Prior to the use of a material that has not previously been used in this equipment, the operator shall submit a copy of the MSDS for the material to the responsible District engineer and inspector.

[RULE 1401, 9-20-2010]

[Devices subject to this condition: [D3285](#), [D3850](#), [D3981](#), [D3982](#)]

E73.6 Notwithstanding the requirements of Section E conditions, the operator may, at his discretion, choose not to use ammonia injection if:

The NO_x emission limits are able to be met without ammonia injection.

[Rule 1303, 12-6-2002]

[Devices subject to this condition: [C4200](#), [C4201](#)]

E102.1 The operator shall discharge dust collected in this equipment only into closed containers.

[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997; RULE 401, 3-2-1984]

[Devices subject to this condition: [C1908](#), [C1909](#)]

E193.5 The operator shall construct, operate, and maintain this equipment according to the following specifications:

To establish equivalency of a catalyst, the operator shall submit the following information for the catalyst to the District permitting engineer: manufacturer, description (type), configuration, dimensions (per block), number of blocks, total volume, space velocity, life, vendor performance guarantee, performance curve (versus temperature), minimum operating temperature, estimated SO₂ to SO₃ conversion, estimated NO to NO₂ conversion, and concentration of Rule 1401 TACs.

The operator shall not install and use an “equivalent” catalyst until approval is received in writing from the District.

[RULE 1303(a)(1)-BACT, 5-10-1996]

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 27
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

[Devices subject to this condition: C2210, C2213, C2217, C3058, [C4200](#), [C4201](#)]

H23.2 This equipment is subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
H2S	40CFR60	Subpart J

[**40CFR 60 Subpart J, 6-24-2008**]

[Devices subject to this condition: D84, D471, D472, D473, D641, D643, D3031, C3148, D3530, D3778, D3805, D3806, [D3973](#)]

H23.3 This equipment is subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
VOC	District Rule	1173

[**RULE 1173, 5-13-1994; RULE 1173, 2-6-2009**]

[Devices subject to this condition : D3576, D3577, D3581, D3584, D3586, D3588, [D3595](#), D3610, D3631, D3635, D3640, D3642, D3643, D3644, D3645, D3646, D3649, D3650, D3651, D3654, D3655, D3656, D3657, D3659, D3660, D3661, D3662, D3663, D3664, D3665, D3666, D3667, D3668, D3669, D3670, D3678, [D3679](#), D3680, D3681, D3682, [D3684](#), D3685, D3691, D3692, D3693, D3694, D3760, D3802, D4086, D4087, D4088]

H23.19 This equipment is subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
VOC	District Rule	1173
VOC	40CFR60	Subpart GGG

[**RULE 1173, 5-13-1994; RULE 1173, 2-6-2009; 40CFR 60 Subpart GGG, 6-2-2008**]

[Devices subject to this condition: D196, D237, D633, D1047, D1048, D1049, D1054, D1929, D1930, D1981, D2042, D3522, D3527, D3577, D3579, D3580, D3581, [D3583](#), D3585, [D3587](#), D3613, D3622, D3634, D3636, D3637, D3638, D3639, D3675, D3679, D3686, [D3726](#), D3803, D3921, D3969, D4085, D4107, D4302, D4303, D4304]

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 28
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

H23.40 This equipment is subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
PM10	District Rule	1105.1
NH3	District Rule	1105.1

[**RULE 1105.1, 11-7-2003**]

[Devices subject to this condition: **D203**]

H23.42 This equipment is subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
CO	40CFR60	Subpart J
PM	40CFR60	Subpart J
Visible Emissions	40CFR60	Subpart J
CO	40CFR63	Subpart UUU
PM	40CFR63	Subpart UUU
Visible Emissions	40CFR63	Subpart UUU

[**40CFR 60 Subpart J, 6-24-2008; 40CFR 63 Subpart UUU, 4-20-2006**]

[Devices subject to this condition: **D203**]

K40.4 The operator shall provide to the District a source test report in accordance with the following specifications:

Source test results shall be submitted to the District no later than 60 days after the source test was conducted.

The source test shall contain the information specified by condition D29.10.

[**RULE 1105.1, 11-7-2003; RULE 1303, 12-6-2002**]

[Devices subject to this condition: **D203**]

K67.22 The operator shall keep records, in a manner approved by the District, for the following parameter(s) or item(s):

The amount and kind of catalyst additive(s) supplied to the process/FCCU from this equipment on a daily basis.

~~Daily performance on the control of NO_x and/or SO_x emissions from the process resulting from the use of NO_x and SO_x Reduction catalyst additive(s) supplied from this equipment. This information shall be submitted to the District within 15 days from the end of each month catalyst additive was used in the FCCU.~~

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 29
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Records shall be maintained and kept on file for at least five years, and shall be made available to the Executive Officer or his authorized representative upon request. ~~Once the Title V permit is issued, records shall be maintained for five years.~~

[**RULE 1303(b)(2)-Offset, 5-10-1996; RULE 2011, 5-6-2005; RULE 2012, 5-6-2005**]
 [Devices subject to this condition: **D3285, D3850, D3981, D3982**]

Note: The FCCU permit does not contain a performance requirement for the NOx and SOx reduction catalyst additives. The performance reporting requirement is being removed from this condition since it was included to collect data for informational purposes only and Chevron has provided the required monthly performance data since 2005. Chevron does not routinely use any NOx reduction catalyst additives. The monthly reports have included the following information: amount and type of SOx reduction additive, FCC feed rate, sulfur concentration in FCC feed, SOx concentration in stack exhaust gas, and SOx emission in lb/day.

K67.45 The operator shall keep records, in a manner approved by the District, for the following parameter(s) or item(s):

The date, time, and description of any maintenance or repairs resulting from the inspection

The name of the person performing the inspection and/or maintenance of the filter media

The date, time, and results of the inspection

[**RULE 1303(a)(1)-BACT, 5-10-1996**]

[Devices subject to this condition: C3864, **C3983, C3984, C3985**]

K67.65 The operator shall keep records, in a manner approved by the District, for the following parameter(s) or item(s):

The date, time and duration of any breach of the water seal.

[**RULE 1303, 12-6-2002**]

[Devices subject to this condition: **D4202**]

K171.19 The operator shall provide to the District the following items:

Final Drawings and /or specifications of the equipment installed/constructed/modified shall be submitted to the District within 60 days after its construction.

[**RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(b)(2)-Offset, 5-10-1996**]

[Devices subject to this condition: ~~**D203, D212, D214, D258, D259, D264, D265,**~~ D3965, D3966, D3967, D3968, ~~**D3971, D3972, D3973, D3974, D3975, D3976**~~]

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 30
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

FEE ANALYSIS

As shown in the following table, Chevron has paid all applicable fees for the subject change of condition application.

Summary of Fee Analysis

A/N	Equipment Description	BAT/ CAT	Fee Schedule	Fee Type	Fiscal Year (1)	Fee
479168	ESP for FCCU	27 (CAT)	H	Modification	07-08	\$ 19,076.87
502414	SCR System	81 (CAT)	C	Change of Condition	09-10	\$ 1,758.90
512104	RECLAIM/Title V Permit	555009 (BAT)	an.	Facility Permit Amendment	09-10	\$ 1,723.07
513694	FCCU	251250 (BAT)	H	Change of Condition	10-11	\$ 14,164.99
Total						\$ 38,446.90
Fees Paid						\$ 45,529.40
Outstanding Balance						\$ -7,082.50

(1) Based on the date that the application was submitted.

COMPLIANCE RECORD REVIEW

The NOV's shown in the table below are for violations that occurred at the FCCU regenerator and the FCCU Flare. NOV's P48735 and P48736 were issued for violation of the opacity limit of District Rule 401 on various days during April and May 2011. NOV P26984 was issued for violation of the Rule 1118 requirement to "operate all flares in a smokeless manner with no visible emissions except for periods not to exceed a total of five minutes during two consecutive hours". According to Paul Caballero, the District Inspector for the Chevron Refinery, the FCCU regenerator has maintained compliance with the Rule 401 visible emission limit since May 7th and the flare has maintained compliance with the Rule 1118 requirement since April 23rd.

Notice No.	Notice Type	Violation Date	Status	Violation
P48735	NOV	Various Dates Starting 4/3/11	In Compliance	Facility discharged visible emissions through ESP (C1908 & C1909) connected to FCCU regenerator (D203) in excess of 20% opacity over three minutes in an hour on 4/3/11 ---4/20/11 (12 days total) ,and in excess of 40% opacity over three minutes in an hour
P48736	NOV	Various Dates Starting 4/23/11	In Compliance	Facility discharged visible emissions in excess of 20% opacity through ESP (C1908&1909) connected to FCCU (D203) regenerator over three minutes in an hour on 4/23/11 -5/7/11 (7 days) and over 40% opacity on 4/23/11 - 5/7/11(4 days)

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 31
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Notice No.	Notice Type	Violation Date	Status	Violation
P26984	NOV	4/23/11	In Compliance	1) NOT ALL FLARES WERE OPERATED IN A SMOKELESS MANNER - VISIBLE EMISSIONS WERE OBSERVED FOR GREATER THAN 5 MINUTES IN 2 HOURS. 2) THE FACILITY DID NOT OPERATE IN COMPLIANCE WITH ALL CONDITIONS SPECIFIED IN THEIR TITLE V PERMIT, D323.2

PERMIT HISTORY

A history of previous permits for the subject permit units is contained in the tables below.

Permit History for the FCCU (Process 3, System 1)

Permit to Construct		Permit to Operate		Description of Modification
No.	Issue Date	No.	Issue Date	
8000		13303	1-18-55	New construction
A23805	1965			Installation of caustic treating equipment.
A35800	1967			Installation of new internal cyclones in the regenerator and fractionation support equipment.
A38180	1967			Modification of the FCCU gas recovery system.
A44933	1969			
A51219	1969	P35216	10-24-69	Installation of column C-111 and supporting pumps.
A66596	1972	P48675	2-16-72	Replacement of steam driven interstate pump P-140 with an electrically driven pump.
A76084	5/73			Replacement of interstate pump P-140 with a similar pump with mechanical seals.
A80699	7/74	P54854	6-4-75	Installation of a water/gasoline settling vessel (V-275) and replacement of the turbine drive on P-140.
C08855	1977	M01700	1-11-78	Added some miscellaneous equipment. No emission increase.
C23027	4/79			FCC Debottlenecking project – Modified the distillation section.
C36474	2/81	R-M36660	3-12-84	Installed caustic degassing drum V-290 and preheated E-20.
235940	2/91			Replaced some heat exchangers and installed a catalyst additive vessel.
244617		D48890	2-26-92	Added connection to the H2S plant.
275098	6/93			Installation and removal of equipment to improve plant conversion efficiency.
305736	8/95			Replacement of the FCCU reactor and mod. Of ancillary equipment.
318507		F10625	12-5-97	Installed new reactor feed treated, removed some Has, and relocate some equipment.
377048	2/01			Replaced wet gas compressor with an electric driven compressor.
377967		F37160	2-9-01	Change of condition to bypass the CO boiler.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 32
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Permit to Construct		Permit to Operate		Description of Modification
No.	Issue Date	No.	Issue Date	
387311	9/01			Use of NOx and SOx catalyst additives.
400546	4/03			Installation of catalyst additive vessel V-19A.
401531		F53361	7-9-02	Administrative equipment description change.
402253		F53239	6-28-02	Administrative equipment deletion (D315).
410074		F60980	5-27-03	Admin. for addition of cat. additive vessel V-11A.
410240	11/04	an.	an.	Modification of the FCCU regenerator including an increase in the regenerator size and the installation of new catalyst and combustion air distribution systems to increase the throughput through the FCCU from a 68 MOPED to 74 MOPED. The FCCU modifications are part of Chevron's CARB RFG3 Project to overcome the lost production of gasoline that resulted due to earlier modifications in the RFG3 project.
433459	1/05	an.	an.	Addition of four new catalyst additive vessels and change of condition to allow use of a wider variety of NOx and SOx reduction catalyst additives.
444698	8/05	an.	an.	Research permit for installation of an oxygen enrichment system for the FCCU regenerator. The expiration date for this permit was extended to 8/06/06.
457781	7/06	an.	an.	Change of VOC emission limit.
454221	8/06	an.	an.	Regular permit to construct for an oxygen enrichment system.
463989	7/07	an.	an.	Installation of an SCR system downstream of the FCCU regenerator.
470768	5/08	an.	an.	Modification of the FCCU fractionation section as part of Chevron's PRO Project. Modifications include: Replacement of existing Deethanizer Column C-130 with a larger column(s) (C-130A/B; D4256&D4257); Installation of Sour Water Draw Pot V-132B (D4258) and steam condensate vessel (D4259). Originally planned to remove Depropanizer Columns C-180 and C-190 but later cancelled this portion of the PRO Project.
513694	na.	na.	na.	Subject application for revision of permit condition S42.1.

Permit History for FCC Air Pollution Control System (P3S4)

Permit to Construct		Permit to Operate		Description of Modification
No.	Issue Date	No.	Issue Date	
		P63409		Incomplete records.
C06523		M03520	6/75	Addition of boiler feedwater economizer to CO Boiler.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 33
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Permit to Construct		Permit to Operate		Description of Modification
No.	Issue Date	No.	Issue Date	
145174	6/86	D04241	12/88	Addition of ammonia injection system to CO Boiler.
198204	5/89	D13673	1/90	Change of condition related to ammonia injection system.
236224	9/90	D37343	4/91	Installation of a 4th transformer/rectifier for each of the existing ESPs K-13A and K-13B.
R273923	8/93	F10626	12/97	Replaced existing ESPs K-13A and K-13B with new ESPs K-50 and K-60. Also issued separate permits for the CO Boiler and ESPs. ESP permit is under A/N 273923 and CO Boiler under A/N 312379.
312379	3/96	na.	na.	Permit is modified to allow CO Boiler to operate when the FCCU is shutdown.
361857	11/99	na.	na.	Installation of an overfire air system on the CO Boiler.
373869	9/00	na.	na.	Modification of the CO Boiler overfire air system.
410241	11/04	na.	na.	CO Boiler removed from operation and physically removed from the refinery.
413822	4/05	na.	na.	Change of condition to allow operation of the FCCU with only one of the two ESPs in operation.
465249	7/07	na.	na.	Installation of the SCR system upstream of the ESPs.
479168	5/08	na.	na.	Modification of the FCCU fractionation section as part of Chevron's PRO Project. No physical modification of the ESPs or changes to the ESP permit.

Permit History for FCCU SCR System (P3S6)

Permit to Construct		Permit to Operate		Description of Modification
No.	Issue Date	No.	Issue Date	
464423	7/10/07	na.	na.	Original construction of the SCR.
478517	5/9/08	na.	na.	Modification of the FCCU fractionation section as part of Chevron's PRO Project. No physical modification of the SCR or changes to the SCR permit.
502414	na.	na.	na.	Subject application for change of the SCR catalyst description.

PROCESS DESCRIPTION

Reactor - The fluidized catalytic cracking unit is used to convert heavy refinery products, such as gas oil (with 18-35 carbon atoms per molecule, with a boiling range of 500-1000°F) to lighter, more desirable products for gasoline blend stocks. The cracking process is conducted at high temperatures (950-1010 °F) and pressures (15-30 psig) with a residence time of 2-10 seconds in the FCC Reactor (R-20; D3116). The gasoline yield represents the majority of the FCC product. The remainder byproducts are both light products as well as heavy cycle oils. The heavy products may be recycled for further cracking.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 34
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

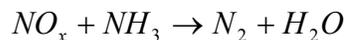
The fresh feed is preheated prior to entering the bottom of the FCC Reactor, R-20. The feed comes in contact with hot regenerated catalyst at the bottom of the unit. The catalyst-oil mixture sweeps up a riser, where the reaction takes place. The catalyst/ cracked products enter a reactor after leaving the riser. At the top of the reactor, the mixed catalyst and cracked products enter a series of cyclones where they are separated.

Fractionator and Gas Recovery Sections - The reaction mix from the reactor enters the Main Fractionator (C-100; D218), where the separation of cracked gas oils and lighter products takes place. Heavy gas oil is drawn directly off the Main Fractionator into a steam stripper (C-110B; D3265). The Main Fractionator overhead gases and liquids flow to the Gas Recovery Section.

In the Gas Recovery Section, the uncondensed gases are compressed prior to being routed to the Deethanizer Column (C-130A/B; D4256 & D4257), where most of the hydrogen, methane, and ethane are separated and sent to an H₂S Plant for removal of sulfur compounds. The overhead stream from the Deethanizer is routed to two parallel Debutanizers C-140 (D259) and C-160 (D261). The Debutanizer bottom streams are intermediate gasoline product that are hydrotreated and utilized in the gasoline blend pool. The Debutanizer overhead streams are sent to three parallel Depropanizers to separate C₃ product from C₄ product. Depropanizers C-180 (D263) and C-190 (D264) are located in the FCCU but Depropanizer C-12 is located in the Alkylation Feed Fractionation Unit (Process 8, System 2).

Regenerator - The catalyst leaving the reactor is not only coked but also contains some hydrocarbons, which is stripped with steam. The stripped catalyst flows to the regenerator where the catalyst is contacted with air to burn the coke off the catalyst surface. The spent catalyst from the reactor is distributed onto the top of the catalyst bed in the regenerator and the air is introduced into the bottom of the catalyst bed. The air supply system is equipped with an oxygen enrichment system. The regenerated catalyst is recycled from the bottom of the regenerator back to the reactor riser. The combustion byproducts exiting the catalyst bed contain some entrapped catalyst fines. Some of the catalyst fines are removed by the 1st and 2nd stage cyclones inside the regenerator.

Air Pollution Control System - Additional catalyst fines removal occurs in the external 3rd stage cyclones and two parallel ESPs. Two parallel SCR for NO_x control are located between the cyclones and ESPs. Only one SCR reactor is in service at any given time, while the other is available as a back-up. SCR systems reduce NO_x by reacting it with ammonia in the presence of a catalyst. The reaction results in the formation of elemental nitrogen and water, as shown in the equation below.

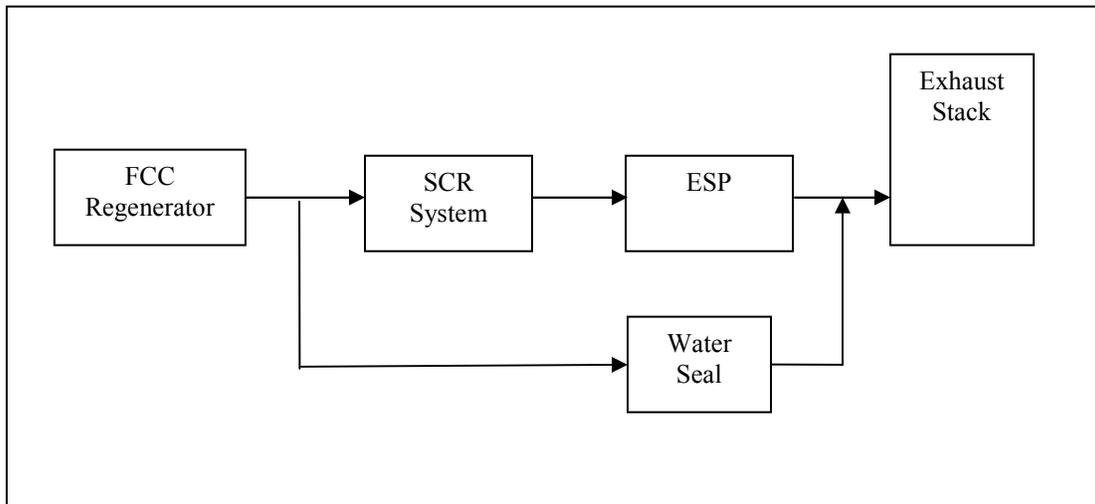


The aqueous ammonia is introduced into the gas stream one of the cyclones upstream of the SCR. The cyclone provides the mixing action to provide a homogenous ammonia concentration across the duct. The SCR catalyst bed is protected from fouling with catalyst fines through the use of soot blowers, which consist of an array of steam nozzles that sweep the face of the catalyst. The high velocity steam entrains the particulate matter back into the gas stream.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 35
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

As seen in the block diagram below, the SCRs are equipped with a bypass to allow the gas stream to be routed around the SCR catalyst bed(s) and ESPs in the event of high line pressure caused by excessive fouling of the SCR bed(s) by catalyst fines. The bypass line is isolated from the exhaust stack by a water seal that prevents the gas stream from bypassing the SCR until the line pressure exceeds the set point of the seal. The use of the bypass is limited to emergency situations to prevent catastrophic failure of equipment. This abnormal operation would require the applicant to comply with the breakdown provisions described by District Rule 430. According to Chevron, there have been no breaches of the water seal since the SCR system was put into operation in February 2009.

Block Flow Diagram Describing the System



Recent Projects - Several permits to construct for modifications and permit condition change have been issued for the FCCU since the last issuance of a regular permit to operate in Section D of the RECLAIM/Title V permit. These projects are described below.

A/Ns 410240 and 410241 – Chevron performed their FCCU Debottleneck Project to increase the maximum design capacity of the FCCU from 68,000 bbl/day to 74,000 bbl/day in order to replace some of the gasoline production capacity lost as a result of their CARB Phase 3 Gasoline Reformulation Project. The following modifications were made under this project:

- Modified the regenerator through use of Kellogg, Brown, and Root (KBR) proprietary technology, which included new counter-current flow spent catalyst and air distributors for improved distribution of the spent catalyst and combustion air.
- Removal of the CO Boiler from the FCCU Air Pollution Control System. The FCCU regenerator was originally operated in a partial combustion mode with high CO emissions. The CO Boiler was required to control CO emission. In the past, the regenerator was switched to full combustion operating mode, which resulted in lower CO emissions. Following the debottleneck modifications to the regenerator, the regenerator was able to comply with the 500 ppmv CO emission limit without use of the CO Boiler. Following construction of the SMR hydrogen plant, the refinery no longer had a need for steam produced in the CO Boiler.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 36
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

- Minor modifications to the fractionation section of the FCCU.

A/N 413822 – Change of condition to allow operation of the FCCU with only 1 of the 2 ESPs in operation.

A/N 433459: Chevron installed four new catalyst additive vessels and permitted the use of various DeNOx additives, DeSOx additives, and performance enhancing additives in the FCCU regenerator. These vessels are labeled with Chevron ID Nos. V-19 (D3285), V-19A (D3850), V-19B (D3981), and V-19C (D3982). Vessel V-19 was installed as a replacement for an existing vessel of the same Chevron ID. The new vessel has twice the capacity of the replaced vessel. Chevron originally received a permit to construct for V-19A under A/N 400546 in 2003 but it was not constructed at that time.

A/N 454221: Chevron installed an oxygen enrichment system, which injects vaporized oxygen into the main blower. Following completion of the Debottleneck Project, the FCCU regenerator was unable to reach the design/permitted throughput due to the inability of the main air blower to provide adequate combustion air and maintain pressure in the regenerator. Chevron subsequently installed a larger main blower under A/N 470768.

A/Ns 463989, 464423 & 465249 - Installation of parallel SCRs (R-50, C4200 & R-60, C-4201) for compliance with NOx limits imposed by Chevron’s Consent Decree.

A/Ns 470768, 478517 & 479168 – The following modifications were made to the FCCU as part of Chevron’s PRO Project:

- Replacement of existing Deethanizer Column C-130 with a larger column. The new Deethanizer column (C-130A/B) is listed in the permit as the following two columns since it has two distinct sections: Primary Absorber Column C-130A (D4256) and the Stripper Column C-130B (D4257).
- Installation of Sour Water Draw Pot V-132B (D4258).
- Installation of a steam condensate vessel (D4259).

Construction of the following equipment was permitted as part of the PRO Project but Chevron later cancelled this portion of the PRO Project

- Installation of a new main air blower (K-10x, D4255) to replace the existing blower (K-10, D3267).
- Replacement of Depropanizer Columns C-180 (D263) and C-190 (D264), which are located in the FCCU, with a new depropanizer column (C-5720) in the FCCU Gasoline Splitter Unit (Process 3, System 5).

EVALUATION OF REQUESTED PERMIT CONDITION AND EQUIPMENT DESCRIPTION CHANGES

FCCU SCR Catalyst - Chevron was given the opportunity to comment on proposed permit equipment descriptions and conditions during evaluation of the application for a permit to construct for the FCCU SCR in 2007. At that time, Chevron commented that the SCR catalyst description should be changed from “*BASF Model 1545/G/10*” to “*BASF Model 04-85-502/G/12*”. Chevron also provided an MSDS for BASF Catalyst 04-85. The requested change appears to have been inadvertently left out of the permit.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 37
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

BASF states in a letter to Chevron that the MSDS for BASF Catalyst 04-85 “represents a number of catalyst designs with the same chemical make-up but with minor variations in design – primarily the catalyst pitch”. It is judged that “*BASF Model 04-85*” is adequate description of the FCCU SCR catalyst and that this is the catalyst type that was evaluated for a permit to construct in 2007. Revision of the catalyst description to “BASF Model 04-85” has no impact on the engineering evaluation of the catalyst that was performed in 2007. Therefore, the requested change is administrative in nature with no further analysis required.

FCCU Regenerator Catalyst Additives Chevron utilizes or has the potential to utilize the following types of catalyst additives in the regenerator: NOx reduction additives, SOx reduction additives, performance optimizers and combustion (CO) promoters. The specific additives that Chevron is currently permitted to use are specified in permit condition S42.1. Chevron requests that the use of the catalyst additives listed in the table below be permitted by adding them to permit condition S42.1. Based on their MSDSs, none of these additives contain any Rule 1401 listed toxic air contaminants.

Manufacturer	Catalyst Additive Name	Additive Type
INTERCAT	COP-550	Combustion Promoter
INTERCAT	COP-NP	
INTERCAT	BAC-105	Bottoms Cracking Additive
INTERCAT	HI-Y	
INTERCAT	PENTA-CAT	Performance Optimizer
INTERCAT	PENTA-CAT HP	
INTERCAT	PENTA-CAT PLUS	
INTERCAT	SUPER Z	
INTERCAT	ZMX-B	
INTERCAT	ZMX-B HP	
INTERCAT	ZMX-C	
INTERCAT	ZMX-C HP	SOx Reduction Additive
Albemarle	DuraSOx	
W.R. Grace	SOx EXP	

Chevron also requests that condition S42.1 be revised to allow the use of other catalyst additives in the future that are not listed in the condition.

Catalyst Additive Vessel V-19 was replaced and Catalyst Additive Vessels V-19A through V-19C were installed under PC A/N 433459. Permit condition S42.1 was imposed on the FCCU permit unit under this PC. It is specified in the engineering evaluation for PC A/N 433459 that the new catalyst additive vessels will emit PM10 during catalyst additive loading activities but the use of the subject additives and additive loading vessels will not impact the maximum potential PM10 emissions from the FCCU regenerator. The combined maximum potential PM10 emissions for the four catalyst additive vessels were estimated in the

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 38
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

engineering evaluation to be 0.04 lb/day on a 30-day average basis. Catalyst additive type has no impact on the maximum potential PM10 emissions for the catalyst additive vessels.

Some catalyst additives contain Rule 1401 listed Toxic Air Contaminants (TACs). The health risk of these additives was analyzed in the engineering evaluation for A/N 433459. This health risk analysis is copied below.

From A/N 433459 - The maximum amount of Rule 1401 listed TACs contained in the FCCU catalyst additives is shown in the table below. Both Vanadium Pentoxide and Copper Compounds are listed as acute hazards. They are not specified as chronic or cancer hazards.

Catalyst Additive Type	R1401 Compound	Max. Percentage in Cat. Additives
NOx Reduction	Copper Compounds	20
SOx Reduction	Vanadium Pentoxide	10
Process Improvement	Copper Compounds	4

The maximum acute risk must be evaluated. Therefore, the emission calculations are based on the following worst case assumptions:

1. The maximum possible rate of catalyst additive addition is 2000 lb/hr total for each of the 4 catalyst additive vessels combined for a total of 8000 lb/hr. This is an ultra conservative assumption.
2. The maximum amount of catalyst additive in the equilibrium catalyst inventory is 8%. All of this catalyst additive is KDSOX SOx Reduction Additive at the maximum Vanadium Pentoxide concentration of 10 percent (weight). This is worst case additive since it has a higher acute hazard risk than the NOXGETTER (TYPE A & B) NOx Reduction Catalyst with a 20% concentration of copper compounds.
3. The PM10 emissions for the FCCU are at the Rule 1105.1 filterable PM10 limit of 2.8 lb per 1000 bbl of fresh feed and 90% of the PM from the FCCU is PM10.
4. Nearest residential, commercial, or industrial receptor is at 1000 meters.

Catalyst Additive Vessels

The maximum emission rate of catalyst additive from loading of additive into the additive vessels is 0.08 lb/hr based on a maximum additive loading rate of 8000 lb/hr (or day). This estimate is based on an AP42 uncontrolled PM emission factor of 2.0 lb per ton for cement silo loading and a total control efficiency of 99% for the cyclone and cartridge filters. The estimated maximum potential emission of Vanadium Pentoxide is 0.02 lb/hr based on 20% (wt.) Vanadium Pentoxide in the catalyst additive.

FCCU Exhaust Stack

The estimate of worst case PM10 emissions from the FCCU is based on the R1105.1 emission limit of 2.8 lb of filterable PM10 per 1000 bbls of fresh feed. At a short term maximum of 74,000 bbl / day (3.08 Mbbl/hr) of fresh feed, the maximum PM10 emission rate is 8.6 lb/hr [(2.8 lb/Mbbl)(3.08 Mbbl/hr)]. The maximum PM emission rate is 9.6 lb/hr [(8.6 lb PM10/hr)/(0.9 lb PM10/ lb PM)].

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 39
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Assuming that 8% of the equilibrium catalyst inventory is catalyst additive. The catalyst additive emission rate from the FCCU exhaust stack is 0.77 lb/hr [(9.6 lb PM /hr)(.08 lb additive/lb PM)]. The estimated maximum potential emission of Vanadium Pentoxide is 0.15 lb/hr based on 20% (wt.) Vanadium Pentoxide in the catalyst additive.

Tier II Risk Assessment

A Tier II risk assessment is performed since the FCCU exhaust stack and the catalyst additive vessel emission points are at different elevations. For the Tier II assessment, the FCCU stack emissions and the DeNOx loader emissions will be separated due to differences in the stack heights (> 49 ft vs. 14 to 24 ft). The results of the Tier II risk assessment are summarized in the table below.

Toxic Air Contaminant	Emission Source	Qhr (lb/hr)	X/Qhr (1) (ug/m3)/(lb/hr) at 1000 m	Acute REL (2)	HIA (3)
Vanadium Pentoxide	Regenerator	0.15	7.3	3.00E+01	0.037
	Additive Vessel	0.02	8.4	3.00E+01	0.006
Total					0.043

(1) Table 6; (2) Table 8A; (3) HIA = [(Qhr)(X/Qhr)/acute REL]

The total HIA of 0.04 for the worst case loading and usage of the worst case catalyst additive is well below the Tier II limit of 1.0. The HIA would be below the Tier II limit even at significantly higher catalyst additive loading rates and higher equilibrium levels in the catalyst inventory.

From this Tier II risk assessment, it is determined to be acceptable for Chevron to utilize any catalyst additive that contains up to 20% Copper Compounds or 10% Vanadium Pentoxide. As discussed above, it is also determined that catalyst type has no impact on the maximum potential PM10 emissions from the catalyst additive vessel or FCCU regenerator. Based on this analysis, it is determined that listing of specific catalyst additives in the permit is not required. Therefore, it is proposed that permit condition S42.1 be replaced with condition E71.12, which will be imposed on the catalyst additive vessels (D3285, D3850, D3981, D3982). The text for proposed condition E71.72 is copied below.

The operator shall not use in this equipment any material containing any toxic air contaminants (TACs) identified in the SCAQMD Rule 1401, as amended on or after 09/20/2010, with the exception of copper compounds (CAS No. 7440-50-8) or Vanadium Pentoxide (CAS No. 1314-62-1).

The operator may use material that contains up to 20 wt. percent Copper Compounds (CAS No. 7440-50-8) or 10 wt. percent Vanadium Pentoxide (CAS No. 1314-62-1).

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 40
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Prior to the use of a material that has not previously been used in this equipment, the operator shall submit a copy of the MSDS for the material to the responsible District engineer and inspector.

The utilization of this condition will assure compliance with Rule 1401.

Yard Air Line

The FCCU regenerator is equipped with two air compressors/blowers. The K-10 compressor is the main air blower. It provides a minimum of 80,000 scfm and maximum of 155,000 scfm of air through an air distribution manifold in the regenerator. Air from the K-11 compressor gives initial lift to the spent catalyst entering the regenerator catalyst distribution manifold. It supplies an average of 750 scfm and maximum of 1225 scfm of air to manifold. Currently, when the K-11 compressor is out of operation for repair or maintenance, steam is utilized to provide initial catalyst lift. Chevron proposes to install a new 3 inch air line from the existing refinery yard air system to the 3 inch discharge line of the K-11 compressor. The line will be tied into the discharge line upstream of existing flow meter 50FE003 and control valve 50FV003. Following installation of the yard air line, yard air will be utilized in lieu of steam to provide catalyst lift when the K-11 compressor is taken out of operation for repairs or maintenance. Utilizing air from the yard air system to provide initial catalyst lift in lieu of air from the K-11 compressor is not expected to have any impact on the operation of the regenerator or emissions from the regenerator. This backup air line will be listed in the description of the K-11 compressor.

CALCULATIONS

As discussed above, Chevron's proposed change in SCR catalyst description and use of the proposed catalyst additives in the regenerator does not impact the estimated maximum potential criteria and toxic air pollutants from the FCCU. This section contains an estimate of the maximum estimated emissions of CO, NH₃, NO_x, PM₁₀, SO_x and VOC and a review of the change in estimated emissions for the FCCU permits issued during the last 10-year period.

Estimated Criteria Pollutant Emissions - The table below contains a summary of the maximum potential CO, NH₃, NO_x, PM₁₀, SO_x and VOC emissions for the FCCU and the basis for the estimates.

Pollutant	Estimated Maximum Potential Emissions (lb/day)	Basis For Emission Estimate
CO	8085	Maximum regenerator exhaust gas flow (design is 152,000 scfm) and 500 ppmv CO limit (BACT and MACT UUU). (1)
NH ₃	112.0	Maximum regenerator exhaust gas flow and the Rule 1105.1 NH ₃ emission limit of 10 ppmv (3% O ₂). (1)(3)
NO _x	1609	Average emissions for 2002 – 2003. Two year period before the FCCU Debottleneck Project.
SO _x	1250	

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 41
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Pollutant	Estimated Maximum Potential Emissions (lb/day)	Basis For Emission Estimate
PM10	263	Results of Pre Debottleneck Project source test performed upstream of the CO Boiler adjusted for the increase in FCCU feed rate from 68,000 bbl/day to 74,000 bbl/day (256.7 lb/day) and catalyst loading emissions (6.3 lb/day).
VOC	504.2	Post Debottleneck Project source test results for the regenerator (126.5 lb/day) and emissions from fugitive components (377.7 lb/day). (1)(2)

- (1) See calculation below.
- (2) Emissions entered in NSR database will be revised.
- (3) NH3 emissions were not previously entered into the District's NSR database.

Carbon Monoxide (CO) – As stated above and shown below, the maximum potential CO emission estimate for the Debottleneck project was based on the estimated post-construction regenerator exhaust gas flow of 152,000 scfm. Exhaust gas flows in source tests performed after completion of the Debottleneck project were as high as 174,000 scfm. However, the CO emission estimate will not be updated since condition A63.18 specifies a daily CO emission limit of 8085 lb/day. This limit will not be revised.

$$\begin{aligned} \text{CO Emissions} &= \text{Exhaust Flow} \times \left(\frac{\text{ppmvd}}{1000000} \right) \times \text{MW} \times \left(\frac{1}{\text{MV}} \right) \times 60 \times 24 \\ &= 8085 \text{ lb/day} \end{aligned}$$

where,

Exhaust Flow = Pre-Debottleneck Project estimate of regenerator exhaust gas flow
 = 152,000 scfm
 ppmvd = CO concentration limit = 500 ppmv
 MW = Molecular weight = 28 lb/lb-mol
 MV = Molar volume at 60°F = 379 dscf/lb-mol

Ammonia (NH3) Emissions – As stated above, the NH3 emission estimate for the Debottleneck Project was based on source testing that was performed prior to the project. These emissions were not entered into the District's NSR database. The maximum potential ammonia emissions should be based on the maximum regenerator exhaust gas flow and the Rule 1105.1 NH3 emission limit of 10 ppmv (3% O2).

$$\begin{aligned} \text{NH3 Emissions} &= \text{Exhaust Flow} \times \left(\frac{\text{ppmvd}}{1000000} \right) \times \text{MW} \times \left(\frac{1}{\text{MV}} \right) \times 60 \times 24 \\ &= 110.5 \text{ lb/day} \\ &= 112.0 \text{ lb/day (30-day avg.)} \quad [110.5 \times 365 / 360] \end{aligned}$$

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 42
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

where,

Exhaust Flow = Maximum measured stack gas flow after the Debottleneck Project
 = 171,000 scfm (corrected to 3% O₂)
 ppmvd = NH₃ concentration limit = 10 ppmv
 MW = Molecular weight = 17 lb/lb-mol
 MV = Molar volume at 60°F = 379 dscf/lb-mol

Volatile Organic Compounds (VOC) – VOC emissions are emitted in the regenerator exhaust gas and from fugitive components that handle VOC containing liquids.

Regenerator - The pre “Debottleneck” Project VOC emission estimate of 29.1 lb/day in AN 410240 was based on a general natural gas external combustion emission factor along with the 2-year average CO Boiler fuel usage. The VOC emission factor of 5.5 lbs of VOC per MMscf of natural gas is a default emission factor for external combustion equipment in the District’s Annual Emission Reporting (AER) program. It was specified in the evaluation that a more accurate estimate would be determined following construction based on source testing of the revised regenerator.

Under change of condition application no. 457781, permit condition A63.22, which specified an interim VOC emission limit of 77.2 lb/day on the FCCU regenerator, was added to the FCCU permit. The interim limit was based on results of a June 2005 source test. Condition A63.22 also specified the methodology for development of a permanent VOC emission limit. This methodology included a more extensive source test program performed between August – Dec. of 2006. Per the methodology specified in condition A63.22, a final VOC emission limit of 126.5 lb/day was calculated based on all valid source test results as determined by the Districts Source Test Group.

The post-Debottleneck Project VOC emission estimate and limit is substantially higher than the pre-project estimate but it is believed that this increase is due to the lack of pre-project VOC emissions data and the resulting inaccuracy of the pre-project VOC emission estimate. Based on the reduction in CO emissions resulting from the Debottleneck Project, it is judged that the project also resulted in a reduction of VOC emissions. In development of the MACT Standard for FCCUs (40CFR60 Subpart UUU), EPA determined that CO emissions are a good surrogate for organic HAPS for FCCUs since efficient combustion in the regenerator that would yield low CO emissions would also be expected to yield low organic HAP emissions. This determination is believed to be applicable not only to organic HAPS but to organic compounds in general including volatile organic compounds. Since CO emissions are the best available indicator of combustion efficiency, CO emissions are believed to be the best available surrogate for VOC emissions.

Based on CO CEMS data, the average CO emissions for the regenerator for 2003-2004, which was prior to the “Debottleneck” project, were 15,678 lb/day. The average regenerator CO emissions for the post “Debottleneck” period of June – July 2010, as measured by the CO CEMS, are 3710 lb/day at an average FCCU feed rate of 68.8 Mbbl/day. The estimated CO emissions for this period when extrapolated up to the maximum FCCU Feed rate of 74 Mbbl/day are 3990 lb/day. This equates to a CO emission reduction of over 74% percent even with the increase in feed rate for the FCCU. This substantial reduction in CO emissions is a

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 43
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

good indicator that VOC emissions were also reduced. As a conservative estimate, it is assumed that there is no increase in VOC emissions with the “Debottleneck” modifications and the increase in FCCU feed rate. Therefore, based on source testing of the FCCU regenerator, the maximum potential VOC emissions are estimated to be 126.5 lb/day.

Fugitive Components - The FCCU contains fugitive components (valves, connectors, etc.). Fugitive components that handle gases or liquids that contain VOCs may periodically leak VOC containing gas or liquid to the atmosphere. VOC emissions for these fugitive components are estimated by multiplying the total number of each fugitive component type by an appropriate emission factor. The current fugitive VOC emissions for the FCCU are estimated with emission factors developed from correlation equations from the *California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities* (CARB/CAPCOA - 1999). A VOC concentration of 500 ppmv is utilized in the correlation equations. As seen in [Appendix A](#), the VOC emissions for the FCCU are estimated to be 377.7 lb/day (30-day avg.) with these CARB/CAPCOA emission factors.

Note that previous fugitive VOC emission estimates were performed using emission factors that were developed for and utilized for emission estimates for the CARB Reformulated Fuels Projects at the refineries. These factors were also utilized in the engineering evaluations for subsequent projects including the FCCU modifications performed for Chevron’s PRO Project under PC A/N 470768. The estimated VOC emissions in the District’s NSR database will be updated to account for this change in emission factors.

Summary of Emission Changes for Recent FCCU/FCCU APCS Permits

A/N 413822 – Change of condition to allow operation of the FCCU with only 1 of the 2 ESPs in operation. This change of condition did not cause a change in the estimated maximum potential emissions of CO, NO_x, PM₁₀, SO_x or VOC.

A/N 433459: Addition of 4 new catalyst additive vessels and change of condition to allow the injection of various DeNO_x and DeSO_x additives into the FCCU regenerator. - This project had no impact on estimated CO and VOC emissions. The DeNO_x and DeSO_x additives could potentially reduce NO_x and SO_x emissions but the potential reduction could not be accurately quantified. There was an increase in PM₁₀ emissions from the loading of additives into the loaders. The increase in uncontrolled PM emissions was estimated to be 8 lb/day based on an ultra-conservative total additive loading rate of 4 ton/day and the AP-42 emission factor for cement silo loading of 2.0 lb PM/ton. Controlled PM emissions were estimated to be 0.08 lb/day based on a control efficiency of 99% for the APCS, which consists of a cyclone followed by a cartridge filter. It was also conservatively assumed that all of the emitted PM had an aerodynamic diameter less than 10 microns (PM₁₀).

It was judged that the use of DeNO_x and DeSO_x additives would not impact PM₁₀ emissions from the regenerator since the addition of catalyst additives was not expected to change the overall catalyst inventory in the FCCU or the entrainment of combined catalyst/additive fines in the regenerator exhaust gas. There was also no change in estimated maximum potential CO, NO_x, SO_x or VOC emissions.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 44
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

A/N 454221: Installation of an oxygen enrichment system – Following completion of the debottleneck project, Chevron had difficulty achieving the maximum permitted capacity of the FCCU due to inability for the existing blower to provide adequate combustion air to the regenerator. Oxygen enrichment was utilized to overcome this limitation. The use of oxygen enrichment had no impact on the maximum potential of CO, NO_x, PM₁₀, SO_x or VOC emissions since the maximum potential emissions are based on the permitted maximum reactor feed rate of 74,000 bbl/day, which was not changed.

A/N 457781: Change of VOC emission limit – The regenerator VOC emission limit was revised to an interim level of 77.2 lb/day per condition A63.22. This condition also contained a methodology for determination of a final VOC emission limit. Using the specified methodology, a final regenerator VOC limit of 126.5 lb/day was calculated based on all Method 25.3 test runs performed before December 31, 2006 that met the method precision criteria. A total of 10 test runs were utilized in the calculation. As discussed previously, although the final regenerator VOC emission limit is higher than initial VOC estimate, it was determined that the debottleneck project did not cause any actual VOC emission increase.

A/Ns 463989, 464423 & 465249: Installation of the SCR system for NO_x control – The installation of an SCR reduced NO_x emissions and had no impact on other criteria air pollutants since there was no change in the capacity or operation of the FCCU regenerator. There was no impact on the emission of any toxic air contaminants. The FCCU permit was conditioned with the Rule 1105.1 ammonia limit of 10 ppmv. Ammonia was already being injected upstream of the wet ESP to improve collection efficiency. There was no increase in maximum potential ammonia emissions since the ammonia emission limit and operation of the FCCU regenerator were not impacted by the installation of the SCR.

A/Ns 470768, 478517 & 479168 - Modification of the FCCU fractionation section as part of Chevron's PRO Project. In the engineering evaluation for the PC for A/N 470768, it was estimated that the fugitive VOC emissions for the FCCU would be decreased from 248.6 lb/day to 248.0 lb/day (30-day avg.). The post-modification fugitive VOC emission estimate is 234.7 lb/day for an actual VOC emission decrease of 13.9 lb/day. The detailed fugitive component counts and VOC emission estimates are shown in [Appendix B](#) of this evaluation. The VOC emission decrease is much larger than originally estimated because Chevron cancelled a portion of the project and replaced more valves with bellows sealed valves than originally estimated.

The fugitive emission factors that were utilized for the CARB Reformulated Fuels Projects and subsequent projects were utilized in the estimates for PC A/N 470768. For consistency, the same factors are utilized in the post-modification fugitive VOC emission estimate to determine the change in fugitive VOC emission for the project. Note that neither of these estimates includes a count of wastewater system drains. This does not impact on the estimated VOC emission change for the project since no drains were added or removed under the project.

As noted above, the post-modification (current) VOC emissions were re-estimated with the CARB/CAPCOA emission factors that are currently being utilized for fugitive emission estimates. As seen in [Appendix A](#), the post-modification (current) fugitive VOC emissions including the wastewater system drains are estimated to be 377.7 lb/day (30-day avg.) with the CARB/CAPCOA emission factors.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 45
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

RULE EVALUATION

CONSENT DECREE (No. 3:03 CV 04650-CRB):

The subject Consent Decree (CD) was filed in U.S. District Court in San Francisco on October 16, 2003 and approved by a US District Court Judge on June 27, 2005. This CD is the result of a settlement between Chevron and EPA over alleged violations of the certain Clean Air Act and CERCLA/EPCRA provisions including the New Source Performance Standards. A summary and discussion of the CD provisions that are applicable to the FCCU at Chevron's El Segundo Refinery follows.

Emission Limits

The CD emission limits are shown in the table below. This table includes a reference to the paragraph(s) in the CD that contain each of the emission limits.

Pollutant	Emission Limit	Averaging Time	CD Paragraph No. / CD Page No.
NOx	40 ppmvd @ 0% O2	7 day rolling	11(b) / 14
	20 ppmvd @ 0% O2	365 day rolling	11(b) / 14
SO2	50 ppmvd @ 0% O2	7 day rolling	16(a)(ii) / 25
	25 ppmvd @ 0% O2	365 day rolling	16(a)(ii) / 25
PM	0.5 lb/1000-lb coke burn	3-hr average	22 / 38
CO	500 ppmvd @ 0% O2	1-hr average	27 / 39

As stated in Paragraphs 11c (page 14), 16e (page 26), 24 (pages 38-39), and 28 (page 40), emissions during periods of Startup, Shutdown, or Malfunction (SSM) shall only be used in determining compliance with the 365-day rolling average NOx and SO2 emission limits. Emissions during SSM are not used in determining compliance with the other limits if Chevron implements good air pollution control practices to minimize emissions.

A discussion of compliance with each of these CD limits follows.

CO: A substantial decrease in CO emissions was achieved with the "Debottleneck" modifications to the FCCU regenerator and removal of the CO Boiler in Jan. - Feb. of 2005. For the two month period following the startup of the modified regenerator, CO emissions were much higher than anticipated. Following the regenerator shakedown activities in March and April of 2005, the CO emissions have routinely been well below the 500 ppmv (@ 0% O2) CO limit. Hourly CO emissions were reviewed for June and July of 2010. Average and maximum hourly CO emissions (@ 0% O2) for the FCCU regenerator during the period were 225 ppmv and 434 ppmv, respectively. The proposed permit conditions changes are not expected to impact compliance with the Consent Decree CO limit.

PM: The most recent source test of the FCCU regenerator exhaust stack was performed in May 2010. The source test report was approved by the District's Source Test Group. The average measured PM (total) emissions during the source test were 21.3 lb/hr. The average coke burn rate during the source test runs was 50 Mlb/hr. The PM limit in the consent decree is 0.5 lb per 1000 lb of coke burned. Based on the coke burn rate of 50 Mlb/hr during the

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 46
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

source test, the corresponding emission limit is 25 lb/hr [(0.5lb/Mlb)(50 Mlb)]. The proposed permit conditions changes are not expected to impact compliance with the Consent Decree PM limit.

NOx: Chevron installed the SCR for compliance with the CD NOx limits of 40 ppmvd (7-day rolling avg.) and 20 ppmvd (365 day rolling avg.). The highest 7-day rolling average NOx concentration during June – July 2010 was 15.1 ppmv (0% O2), which is well below the limit of 40 ppmv. The proposed permit conditions changes are not expected to impact compliance with the Consent Decree NOx limits.

SOx: Chevron utilizes feed hydrotreating and SOx reduction catalyst additives for compliance with the CD SOx limits of 50 ppmvd (7-day rolling avg.) and 25 ppmvd (365 day rolling avg.). The highest 7-day rolling average SO2 concentration during June – July 2010 was 25.5 ppmv (@ 0% O2), which is well below the CD limit of 50 ppmv. The proposed permit conditions changes are not expected to impact compliance with the Consent Decree SOx limits.

Continuous Emission (& Opacity) Monitoring Systems (CEMS & COMS)

Paragraphs 15 (pages 24-25), 20 (pages 36-37), 25 (page 39), and 29 (pages 40-41) of the CD specify that Chevron shall install, certify, calibrate, maintain, and operate CEMS for O2, NOx, SO2, Opacity, and CO. The specified effective dates are “date of entry” for the NOx and SO2 CEMS and April 10, 2005 for the opacity COMS and CO CEMS. The CD specifies certification and QA/QC requirements for each of the CEMS. Each of these CEMS/COMS is also subject to the requirements of other rules and regulations. The following table outlines which rules and regulations each of the CEMS are subject to. Each of these rules and regulations (and the CD) contains similar certification and QA/QC requirements.

CEMS Or (COMS)	Consent Decree	NSPS Subpart J (1)	NESHAP Subpart UUU (2)	Rule 218 (3)	RECLAIM (4)
CO	Yes	Yes	Yes	Yes	No
NOx	Yes	No	No	No	Yes
SOx	Yes	No	No	No	Yes
O2	Yes	No	No	Yes	Yes
CO2	No	No	No	No	Yes
Opacity	Yes	Yes	Yes	No	No

- 1.) 40CFR60 Subpart J: New Source Performance Standard - Standards of Performance for Petroleum Refineries
- 2.) 40 CFR63 Subpart UUU: National Emission Standards for Hazardous Air Pollutants for Petroleum Refineries: Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units
- 3.) SCAQMD Rule 218: Continuous Emissions Monitoring – Applicable since the CO CEMS is utilized to comply with the CO mass limit of condition A63.18.
- 4.) Regulation XX: Regional Clean Air Incentives Market

Chevron has installed and certified the CEMS/COMS as required. Additional discussion of the CEMS/COMS is contained in the evaluation of Rule 218, NSPS Subpart J and RECLAIM.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 47
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

The California Environmental Quality Act (CEQA), Public Resources Code Section 21000 et seq., requires that the environmental impacts of proposed “projects” be evaluated and that feasible methods to reduce, avoid or eliminate significant adverse impacts of these projects be identified and implemented. According to the District’s CEQA Guidelines, the net emission increase thresholds for significant effect are:

ROG: 55 lb/day
 PM10: 150 lb/day
 CO: 274 lb/day

CEQA analysis is not required for the administrative change in the SCR catalyst description or the addition replacement of permit condition S42.1 with E71.72 since there is no increase in pollutant emissions and no other significant environmental impacts. On the 400-CEQA form, Chevron marked “No” to all of the additional criterion that may trigger CEQA. For these reasons, CEQA does not apply.

The FCCU Debottleneck Project that was permitted in 2004 under A/N 410240 was part of Chevron’s CARB Phase 3 Gasoline Reformulation Project. An environment impact report (EIR) and addendum to the EIR were certified for this Gasoline Reformulation Project. The Debottleneck Project was evaluated in the addendum. A Negative Declaration was prepared for the SCR construction project. An EIR and addendum were certified for Chevrons PRO Project.

REGULATION II: PERMITS

Rule 212: Standards for Approving Permits

212(c)(1): Public notice is required for a project if any of the modified permit unit(s) are located within 1000 feet of a school. Public notice is not required under this clause since the FCCU and FCCU Air Pollution Control System (ESPs & SCRs) are not located with 1000 feet of the outer boundary of a school.

212(c)(2): Public notice is required for any “new or modified facility”, which has on-site emission increases exceeding any of the daily maximums specified in subdivision (g) of Rule 212.

CO: 220 lb/day
 NOx: 40 lb/day
 ROG: 30 lb/day
 PM10: 60 lb/day
 SOx: 30 lb/day

Public notice is not required under this cause since the proposed change of SCR catalyst type and use of different catalyst additives does not cause an increase in the emissions of any criteria air pollutants. Public notice was required under this clause for the FCCU Debottleneck Project and the FCCU modifications under Chevron’s PRO Project.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 48
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

212(c)(3): Public notice is required for any new or modified permit units that have an increase in toxic air contaminants that results in an increase of maximum individual cancer risk (MICR) of more than one in a million (1×10^{-6}) during a lifetime (70 years).

Public notice is not required under this clause because the proposed change in SCR catalyst type and utilization of different catalyst additives does not cause an increase in MICR.

212(g): 212(g) specifies that any new or modified sources subject to Regulation XIII which undergo construction or modifications resulting in an emissions increase exceeding any of the daily maximum emission thresholds (listed in the table above) will require notification. From Regulation XIII (Rule 1302), the definition of "Source" is any permitted individual unit, piece of equipment, article, machine, process, contrivance, or combination thereof, which may emit or control an air contaminant. This includes any permit unit at any non-RECLAIM facility and any device at a RECLAIM facility.

Public notice is not required under this clause since the proposed permit condition changes will not cause an increase in the emission of any air pollutant.

Rule 218: Continuous Emissions Monitoring

FCCU CEMS Background Information: Prior to the FCCU Debottleneck Project, the CEMS for measurement of emissions from the FCCU regenerator was located on the CO Boiler stack. This CEMS included O₂, NO_x, and SO_x analyzers. The CO Boiler stack was also equipped with a CO analyzer but the CO CEMS was not certified since it was used for process purposes and not for compliance with any regulations or CO emission limits. The FCCU CEMS system was moved to the auxiliary K-25 stack when the CO Boiler was removed. The CO CEMS, which has a range of 0 to 1000 ppmv, is currently used for compliance with the 500 ppmv CO emission limit of the CD, NSPS Subpart J, and NESHAP Subpart UUU and with the CO mass limit of permit condition A63.18.

Rule 218 Applicability [218(b)(1)(A)]: This rule includes requirements for all CEMS except:

- CEMS subject to RECLAIM (Regulation XX); Regulation IX - "New Source Performance Standards (NSPS)", Regulation X - National Emission Standards for Hazardous Air Pollutants (NESHAPS), or Regulation XXXI - "Acid Rain Program".
- CEMS subject to permit conditions where the purpose of the CEMS is to monitor the performance of the basic and/or control equipment and not to determine compliance with any applicable limit or standard.
- CEMS where alternative performance specifications are required by another District rule.

NO_x and SO₂ CEMS: The FCCU NO_x and SO₂ CEMS are not subject to this rule since they were originally installed for compliance with RECLAIM (Regulation XX). A discussion of the recertification of the NO_x and SO₂ CEMS is contained in the evaluation of the RECLAIM Regulation.

CO CEMS: The FCCU CO CEMS is subject to the requirements of this rule since it is utilized to show compliance with the CO mass limit and to show compliance with the 500 ppmv BACT CO emission limit.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 49
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Opacity (COMS): This rule is not applicable to COMS. The FCCU COMS is required for compliance with NSPS Subpart J and NESHAP Subpart UUU. A discussion of the certifications requirements and status of the COMS is contained in the NSPS Subpart J evaluation.

Requirements [218(c)(1)]:

CEMS Certification: The owner or operator of any equipment subject to this rule shall submit an “Application for CEMS” or “Application for CEMS Modification”, as applicable. The application shall require an initial approval by the Executive Officer prior to installation of a new CEMS or modification of an existing CEMS. Chevron received initial approval in a letter dated February 17, 2005.

The applicant must choose one of the following options for certification, operation, and maintenance of a CEMS:

- Certify the CEMS according to District Rule 218.1(b) and operate and maintain the CEMS according to Rule 218(b), (e), (f) and (g) and Rule 218.1(b) and (d), or,
- Certify the CEMS according to 40CFR60 (NSPS) Appendix B - "Performance Specifications" and operate and maintain the CEMS according to Rule 218(b), (e), (f) and (g) and 40CFR60 Appendix F - "Quality Assurance Procedures"

Chevron chose to certify, operate, and maintain the FCCU CO CEMS according to the NSPS option. Chevron performed certification testing of the CO CEMS during the last week of March 2005. This certification test was performed according to the requirements of PS4B in Appendix B of 40CFR60, which includes the following performance evaluation tests and checks: Relative Accuracy Test Audit for concentration and for mass emissions, calibration drift, response time, stratification, and CO2 interference. The CEMS passed all of the applicable tests and checks.

Quality Assurance Procedures [40CFR60 Appendix F]: This appendix of 40CFR60 contains the following two quality assurance procedures:

- Procedure 1. Quality Assurance Requirements for Gas Continuous Emission Monitoring Systems Used for Compliance Determination
- Procedure 2—Quality Assurance Requirements for Particulate Matter Continuous Emission Monitoring Systems at Stationary Sources

The FCCU CO CEMS is subject to Procedure 1. The quality assurance procedures include quarterly audits. These audits include a combination of Relative Accuracy Test Audits (RATA), Cylinder Gas Audits (CGA), and Relative Accuracy Audits (RAA). According to Peter Ko of the District’s Source Testing Group, Chevron has been routinely performing the audits.

REGULATION IV - PROHIBITIONS

Rule 401: Visible Emissions

This rule specifies that a person shall not discharge emissions from a source for a period or periods aggregating more than three minutes in any one hour which are as dark or darker in

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 50
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

shade as that designated No. 1 on the Ringelmann Chart or emissions of such opacity that it obscures an observers view to an equal or greater level. This is equivalent to opacity of 20%.

The FCCU regenerator exhaust stack is equipped with an opacity monitor for compliance with New Source Performance Standard (NSPS) Subpart J and National Emission Standards for Hazardous Air Pollutants (NESHAP) Subpart UUU. Therefore, opacity (visibility) is being monitored continuously. Based on the operational history for the last three (3) months, Chevron appears to have resolved the operational issues that caused sporadic periods of elevated opacity during the period of April 3rd to May 7th. Compliance with this rule is expected.

Rule 402: Nuisance

The only nuisance complaints received for the FCCU during the last two years are complaints related to the FCCU flaring that occurred on April 23, 2001. As discussed previously, Chevron received an NOV for this flaring. The proposed permit condition changes will not have any impact on the nuisance potential of the FCCU. Based on the operational history of the FCCU, compliance with this rule is expected.

Rule 404: Particulate Matter - Concentration

This rule sets concentration limits for total PM (solid and condensable) emissions. The rule limit varies based on the quantity of exhaust gas (dry basis) discharged from a source. Total PM emissions during a May 2010 source test were 0.0144 gr/dscf (21.3 lb/hr). This measured total PM includes ammonium sulfate so it is a conservative value since the test method (SCAQMD Method 5.2) allows the subtraction of ammonium sulfate for FCCUs. The average exhaust gas flow rate during the three source test runs was 172,200 dscfm. From Table 404(a) of R404, the interpolated particulate emission concentration limit at 172,200 scfm is 0.0273 gr/scf. The measured total PM emission concentration of 0.0144 gr/dscf is less than the limit of this rule. Compliance with the PM emission limit of this rule is expected.

Rule 405: Solid Particulate Matter – Weight

This rule sets solid PM mass emission limits for the processing of solid materials. The FCCU regenerator and the catalyst or catalyst handling vessels are subject to this regulation. The solid PM limit in the rule is based on the total process weight. Based on Table 405(a), the emission limit for solid PM is 30 lb/day for all process rates greater than 1,102,000 lb/hr. The average catalyst recirculation rate for the FCCU regenerator during the May 2010 source test was over 7,700,000 lb/hr so the 30 lb/hr solid PM limit is applicable to the regenerator. The solid PM mass emission rate during the source test was 8.3 lb/hr, which is below the 30 lb/hr solid PM limit of this rule. Compliance with this rule is expected.

Rule 407: Liquid and Gaseous Air Contaminants

This rule contains the following emission limits:

- Carbon monoxide (CO) - 2,000 ppmv (dry; 15 minute average) [407(a)(1)]
- Sulfur Compounds – 500 ppmv (calculated as SO₂; 15 minute average [407(a)(2)(B)]

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 51
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

CO Limit - This rule limits the CO emissions to less than 2000 ppmv. Hourly CEMS data for the FCCU regenerator from June and July 2010 was reviewed. The average and maximum CO concentrations during this time period were 220 ppmv and 372 ppmv, respectively. The FCCU regenerator is also subject to 500 ppmv CO emission limits under an EPA Consent Decree, 40CFR60 Subpart J and 40CFR63 Subpart UUU. Compliance with the 2000 ppmv limit of this rule is expected.

Sulfur Compound Limit - The 500 ppmv sulfur compound limit is subsumed by RECLAIM [Rule 2001(j)].

Rule 409: Combustion Contaminants

This rule contains a limit on combustion contaminants from the combustion of fuel of 0.23 gram per cubic meter (0.1 grain per cubic foot) of flue gas (15 minute avg. at 12% CO₂). In Rule 102, combustion contaminants are defined as “are particulate matter discharged into the atmosphere from the burning of any kind of material containing carbon in a free or combined state”.

The FCCU PM emission of 0.0144 gr/dscf (as measured during the May 2010 source test) is well below the 0.1 gr/ft³ PM emission limit established by this rule. Compliance with the PM emission limit of this regulation is expected.

Rule 474: Fuel Burning Equipment – Oxides of Nitrogen

Table 1 in Rule 2001 exempts NO_x RECLAIM facilities from the requirements of Rule 474. This rule is not applicable to the FCCU regenerator since Chevron is a NO_x and SO_x RECLAIM facility.

REGULATION IX - NEW SOURCE PERFORMANCE STANDARDS (NSPS)

40CFR60 Subpart J -- Standards of Performance for Petroleum Refineries and 40CFR60 Subpart Ja -- Standards of Performance for Petroleum Refineries Which Construction, Reconstruction, or Modification Commenced After May 14, 2007

These NSPSs contain standards for CO, Opacity, PM, and SO₂ emissions from FCCU regenerators. NSPS Subpart Ja also contains a standard for NO_x. Chevron’s FCCU regenerator became subject to NSPS Subpart J through the Consent Decree (CD) between Chevron and US EPA. The effective date for the CD and NSPS applicability was June 28, 2005. As required by the Consent Decree, Chevron submitted AN 445738 on July 7, 2005 to incorporate the Subpart A and J requirements into the Facility Permit.

Chevron’s FCCU regenerator is not subject to NSPS Subpart Ja since it has not been subject to reconstruction or modification after May 14, 2007.

Emission Limits - The following table contains a summary of the applicable Subpart J limits.

Pollutant or Exhaust Gas Property	Emission Limit	Averaging or Sampling Time
CO	500 ppmvd (no O ₂ correction)	1-hr average

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 52
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Pollutant or Exhaust Gas Property	Emission Limit	Averaging or Sampling Time
PM	2 lb/ton coke burn (equates to 1 lb/1000-lb coke burn)	Minimum of 60 minute sample time
Opacity	30%	6-minute average (1)
FCCU Reactor Feed Sulfur Content	0.3 percent	Collect one sample during every 8-hour period

(1) Allows a maximum of 6-minute average opacity reading with greater than 30% in any one hour period.

Carbon Monoxide - According to 40CFR60.105(a)(1), for FCCU regenerators that are subject to 60.103(a), the owner or operator shall install, calibrate, maintain, and operate an instrument for continuously monitoring and recording the concentration by volume (dry basis) of CO emissions into the atmosphere. According to 60.13(c), the CO CEMS is also subject to the quality assurance and quality control (QA/QC) provisions of Appendix F of 40CFR60. Chevron has installed and certified a CO CEMS.

§60.7(c) requires that “each owner or operator required to install a continuous monitoring device shall submit excess emissions and monitoring systems performance report and/or the summary report form to the administrator semiannually”. According to §60.105(e), for the purpose of reports under §60.7(c), periods of excess emissions that shall be determined and reported are all 1-hour periods during which the average CO concentration as measured by the CO continuous monitoring system exceeds 500 ppm.

According to 60.7(d), only a summary report must be submitted if the total duration of excess emissions is less than 1 percent of the total operating time or the reporting period and the duration of the CMS downtime is less than 5 percent of the total operating time for the reporting period. If either of these thresholds is exceeded, both the summary report and a the excess emissions report, which among other things includes specification of corrective action or preventative measures taken in regards to periods of excess emissions, must be submitted.

A copy of Chevron’s semi-annual report for the last six months of 2010 was reviewed. For the CO CEMS, only a summary report was required since there were no periods of excess emissions and the total CEMS downtime was 1.1% of the total FCC operating time. The subject summary report contains all of the information specified at 60.7(d).

Additionally, hourly CO emissions were reviewed for June and July of 2010. Average and maximum hourly CO emissions (as measured) for the FCCU regenerator during the period were 227 ppmv and 382 ppmv, respectively. The proposed permit condition changes are not expected to impact compliance with this CO limit.

Opacity - According to 40CFR60.105(a)(1), for FCCU regenerators subject to 60.102(a)(2), the owner or operator shall install, calibrate, maintain, and operate an instrument for continuously monitoring and recording the opacity of emission into the atmosphere. Chevron has installed and certified a continuous opacity monitoring system (COMS). Appendix F of 40CFR60 does not contain any QA/QC procedures that are applicable to COMS.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 53
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

According to §60.105(e), for the purpose of reports under §60.7(c), periods of excess opacity emissions that shall be determined and reported are defined as all 1-hour periods that contain two or more 6-minute periods during which the average opacity as measured by the continuous monitoring system exceeds 30 percent. In their semi-annual report for the last half of 2010, Chevron reported that there were no periods of excess opacity emissions and the COMS downtime was 1.1%.

Additionally, the hourly average opacity data for June and July of 2010 was reviewed. During this period, the average and maximum hourly average opacity for this period was 3.1% and 6.6%, respectively. The proposed permit condition changes are not expected to impact compliance with this opacity limit.

FCCU Feed Sulfur Content or SO₂ - According to 40CFR60.104, the FCCU must comply with one the following limits for feed sulfur or SO₂:

- 1.) Use an add on control to reduce emissions by 90% or to a level of less than 50 ppmv
- 2.) Without an add-on control maintain SO₂ emissions to less than 20 lb per ton of coke burn-off
- 3.) Limit feed sulfur concentrations to no greater than 0.30 percent by weight.

The FCCU regenerator does not have an add-on SO₂ control so Chevron choose to comply with the 0.3 wt% feed sulfur limit. §60.104 specifies that compliance with the FCCU fresh feed sulfur content limit of 0.3 percent by weight is determined daily on a 7-day rolling average basis using the procedures outlined in §60.106. §60.104 specifies that compliance with the FCCU fresh feed sulfur content limit of 0.3 percent by weight is determined daily on a 7-day rolling average basis using the procedures outlined in §60.106. According to §60.106(j), one fresh feed sample shall be collected during each 8-hour period. The sample must be analyzed according to one of the ASTM analytical methods specified. If a representative fresh feed sample cannot be collected at a single location, individual samples must be collected once per 8-hour period for each separate feed stream charge directly into the FCCU riser or reactor.

For a source such as the Chevron refinery that has chosen the 0.3% FCCU feed sulfur limit at §60.104(b)(3), the semi-annual report must include the following:

- Any 7-day period during which the average sulfur content of the fresh feed exceeds 0.30 percent by weight. For each 7 day period that the feed sulfur content exceeds 0.3%, the report must contain an explanation of the exceedance including whether it occurred concurrent with a startup, shutdown, or malfunction of the FCCU or associated air pollution control system, and a description of the corrective action taken, if any.
- Any 30-day period in which the minimum data requirements specified in §60.104(d) are not obtained.
- Each 8-hour period in which a feed sulfur measurement required by §60.106(j) was not obtained, the date for which and brief explanation as to why a feed sulfur measurement was not obtained, for approval by the Administrator.

The semi-annual report for the last six months of 2010 was reviewed. Chevron reported that there were no 7-day periods in which the average FCCU feed sulfur concentration exceeded 0.3 percent and that all required samples were collected and analyzed. Additionally, all of the FCCU feed sulfur sample results for the months of June and July 2010 were reviewed.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 54
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

The highest measured feed sulfur during this period was 0.13 wt%, which is well below the 0.3 wt% limit. The proposed permit condition changes are not expected to impact compliance with this feed sulfur limit.

Particulate Matter – The coke burn limit of 2 lb per ton of coke burn is less stringent than the CD limit of 1 lb/ton of coke burn and the 30 lb/hr maximum limitation imposed by District Rule 405. As discussed previously, the total PM emissions measured during the May 2010 source test were 21.3 lb/hr at an average coke burn rate of 50 Mlb/hr. This coke burn rate equates to a PM limit of 50 lb/hr. The proposed permit condition changes are not expected to impact compliance with this PM limit.

The proposed permit condition changes are not expected to impact compliance with this regulation. Continued compliance with the requirements of this regulation is expected.

40CFR60 Subpart GGG – Standards of Performance for Equipment Leaks of VOCs in Petroleum Refineries and 40CFR60 Subpart GGGa – Standards of Performance for Equipment Leaks of VOCs in Petroleum Refineries for Which Construction, Reconstruction or Modification Commenced After November 7, 2006

Applicability: The following are affected facilities under these subparts:

- Compressors
- The group of all the equipment within a process unit.

Equipment is defined as “each valve, pump, pressure relief device, sampling connection system, open-ended valve or line, and flange or other connector in VOC service”. From Subpart VVa (as referenced from GGGa), the definition of “*in VOC service*” is that “the piece of equipment contains or contacts a process fluid that is at least 10 percent VOC by weight”.

Modification is defined in 40CFR60 Subpart A (§60.2) as “any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted into the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) into the atmosphere not previously emitted.”

Process unit is defined in §60.590 as “components assembled to produce intermediate or final products from petroleum, unfinished petroleum derivatives, or other intermediates; a process unit can operate independently if supplied with sufficient feed or raw materials and sufficient storage facilities for the product”.

The FCCU is currently subject to 40CFR60 Subpart GGG. “Fugitive emissions, miscellaneous” device no D3583 for the FCCU is tagged with condition H 23.19, which specifies that the permit unit is subject to Rule 1173 and 40CFR60 Subpart GGG. NSPS Subpart GGG references the requirements of NSPS Subpart VV - Standards of Performance for Equipment leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry. In general, the equipment leak inspection and monitoring requirements of Rule 1173 are more stringent than this regulation but pertinent requirements of this regulation have been incorporated into Chevron’s Inspection and Monitoring (I&M) Program for fugitive

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 55
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

emissions. It is expected that Chevron will comply with the inspection, maintenance, and record keeping requirements of this rule.

The FCCU is not subject to 40CFR60 Subpart GGGa. The modifications under the PRO Project did not trigger applicability since there was a decrease in fugitive VOC emissions. No new fugitive components will be installed under the subject change of condition applications. Compliance with the requirements of this regulation is expected.

REGULATION X - NATIONAL EMISSION STANDARD FOR HAZARDOUS AIR POLLUTANTS (NESHAPS)

Subpart CC: National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries

This MACT standard is applicable to petroleum refining sources and related emission sources that are specified in section 63.640(c)(5) through (c)(7) (e.g. miscellaneous process vents, storage vessels, wastewater streams, equipment leaks, gasoline loading racks, marine vessel loading, etc.) that are located at a major source and emitter have equipment contacting one or more of the hazardous air pollutants (HAPs) listed in Table 1 of this subpart.

Equipment Leaks: The equipment leak standards for existing sources as specified in 63.648 are applicable to fugitive components that are “in organic hazardous air pollutant service”. In “organic hazardous air pollutant service” is defined as a piece of equipment that either contains or contacts a fluid (liquid or gas) that is at least 5% by weight of total organic HAPs as determined according to 63.180(d).

Some of the fugitive components in the FCCU are subject to the requirements of this regulation since the components are “in organic hazardous air pollutant service”. The “fugitive emissions, miscellaneous” device (D3583) is tagged with “HAP: 40CFR 63 Subpart CC, 5-25-2001” to denote the applicability of this regulation.

This regulation references the fugitive component monitoring requirements of NSPS Subpart VV and NESHAP Subpart H with exceptions that are specifically noted in the regulation. In general, the equipment leak inspection and monitoring requirements of District Rule 1173 are more stringent than this regulation but pertinent requirements of this regulation have been incorporated into Chevron’s Inspection and Monitoring (I&M) Program for fugitive emissions. It is expected that Chevron will comply with the inspection, maintenance, and record keeping requirements of this regulation.

Miscellaneous Process Vents: *Miscellaneous process vent* is defined as “a gas stream containing greater than 20 parts per million by volume organic HAP that is continuously or periodically discharged during normal operation of a petroleum refining process unit. Miscellaneous process vents include gas streams that are discharged directly to the atmosphere, gas streams that are routed to a control device prior to discharge to the atmosphere, or gas streams that are diverted through a product recovery device prior to control or discharge to the atmosphere”.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 56
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

The definition of a *miscellaneous process vent* at 40CFR63.641 specifies a number of vent streams that are not considered to be *miscellaneous process vents*, which are subject to the requirements of this rule. The following streams are included in this list of exempt streams:

- Gaseous streams routed to a fuel gas system
- Relief valve discharges
- “Episodic or nonroutine releases such as those associated with startup, shutdown, malfunction, maintenance, depressuring, and catalyst transfer operations.
- Catalytic cracking unit catalyst regeneration vents.

All of the process vents in the FCCU are exempt streams. Therefore, none of the process vent streams are subject to the miscellaneous process vent requirements of this regulation.

40 CFR63: Subpart UUU: National Emission Standards for Hazardous Air Pollutants for Petroleum Refineries: Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units

The Chevron FCCU is subject to this NESHAP, which had an original compliance date of April 11, 2005. This regulation includes standards for Nickel or PM (as a surrogate for metal HAPs) and CO (as a surrogate for organic HAPs) from regenerator vents. The rule also includes monitoring, recordkeeping, and reporting requirements. A discussion of the Ni (or PM) and CO standards in this regulation follows.

Emission Limitations and Work Practice Standards [63.1564(a) and 63.1565(a)]:

Emission limits [63.1564(a)(2) and 63.1565(a)(2)]: The Metal HAP and Organic HAP emission limits for FCCU regenerators, which are contained in Tables 1 and 8 of the regulation respectively, are referenced at 63.1564(a)(1) and 63.1565(a)(1). A discussion of the Metal HAP and Organic HAP limits in this NESHAP follows:

Metal HAP Emission Limitations: Under this regulation, FCCU regenerators that are subject to NSPS Subpart J must comply with the NSPS Subpart J limits for PM and opacity. As discussed above, Chevron became subject to NSPS Subpart J limits under their Consent Decree. The Chevron FCCU regenerator complies with the PM and opacity limits of NSPS Subpart J.

Organic HAP Emission Limitations: As specified at 63.1565(a)(1) and Table 8 of the regulation, an FCCU regenerator shall not discharge into the atmosphere any gases that contain CO in excess of 500 ppmv (1-hr average, no O2 correction). This is the same CO emission limit that is contained in NSPS Subpart J. As discussed in the evaluation of NSPS Subpart J, compliance with this 500 ppmv CO emission limit is expected..

Operating Limits [63.1564(a)(2) and 63.1565(a)(2)]: The operating limits for FCCU regenerators are contained at 63.1564(a)(2) and 63.1565(a)(2), which reference Tables 2 and 9 of this NESHAP. As seen in Table 2, there are no operating limits specified for FCCUs that are subject to the NSPS limit for PM or for FCCUs that select the NSPS option (option 1). As seen in Table 9, there are no operating limits for FCCUs that utilize a CO CEMS to comply with the CO limit of this NESHAP. Therefore, the Chevron FCCU is not subject to any of the operating limits of this NESHAP.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 57
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Operation, Maintenance, and Monitoring (OMM) Plan [63.1564(a)(3) and 63.1565(a)(3)]: 63.1564(a)(3) and 63.1565(a)(3) specify that the refinery must prepare an OMM Plan according to the requirements in 63.1574(f) and must operate at all times according to the procedures in the plan. Chevron submitted the required OMM Plan to the District on May 10, 2005. On July 13, 2011, Chevron submitted a revised OMM Plan that includes the SCR and associated safety bypass line. A copy of this plan is contained in the engineering file for A/N 513694.

Continuous Compliance [63.1564(c) & 63.1565(c)]:

The continuous compliance requirements for FCCUs are specified for metal (PM/opacity) and organic (CO) HAPS at §63.1564(c) and §63.1565(c) respectively. An evaluation of these requirements follows.

Demonstrate Continuous Compliance with Emission Limits [63.1564(c)(1) & 63.1565(c)(1)]: Demonstrate continuous compliance with each emission limit in Tables 1 and 2 for Metal HAPs (PM/opacity) and Tables 8 and 9 for Organic HAPs (CO). This demonstration must be made according to the methodology specified in Tables 6 and 7 for Metal HAPs (PM/opacity) and Tables 13 and 14 for Organic HAPs (CO).

PM / Opacity: For FCCUs that are subject to the NSPS limits or that have selected the NSPS Option (option 1), Table 7 specifies that the FCCU must comply with the requirements in Table 6. The Chevron FCCU is subject to the following requirements in Table 6:

- Determine and record each day the average coke burn rate using equation 2 in 63.1564 and the hours of regenerator operation
- Maintain the PM emission rate below 1 lb/1000 lb of coke burn
- Collect the continuous opacity monitoring data for each catalyst regenerator vent according to 63.1572
- Maintain each 6-minute average opacity at or below 30 percent except that one 6-minute average during a 1-hour period can exceed 30 percent.

Chevron is recording the specified coke burn rate data and opacity monitoring data as collected with a COMS that has been evaluated according to the requirements at 63.1572.

CO: For FCCUs that are utilizing a CO CEMS for compliance with the CO emission limit, Table 14 specifies that the FCCU must comply with the requirements in Table 13. The Chevron FCCU is subject to the following requirements in Table 13:

- Collect the hourly average CO monitoring data according to 63.1572
- Maintain the hourly average CO concentration at or below 500 ppmv (dry basis).

Chevron is recording the specified CO monitoring data as collected with a CEMS that has been evaluated according to the requirements at 63.1572.

Bypass Lines [63.1569]:

This NESHAP contains requirements for each bypass line serving an FCCU. According to 63.1562(a)(4), a bypass line is a vent system that contains a ductwork that could divert an

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 58
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

affected vent stream away from a control device used to comply with the requirements of this subpart. The work practice standards for bypass lines are specified at 63.1569.

The FCCU and associated air pollution control system did not originally have a bypass line. A safety bypass line was installed with the SCR. As stated in the OMMP, Chevron is complying with option 1 in §63.1569 and Table 36 through installation and operation of a level transmitter to continuously monitor the water level in the bypass line water seal drum.

Reporting [63.1575]

It is specified at 63.1575(a) that all applicable reports required in Table 43 of this NESHAP must be submitted. Table 43 specifies that a facility must submit a semiannual compliance report that contains the following information:

- If there are no deviations from any applicable emission limitation or work practice standard, the report shall contain a statement that there are no deviations from any applicable emission limits or work practice standards during the reporting period and that no CEMS or COMS was inoperative, inactive, out-of-control, repaired, or adjusted.
- If there is a deviation from applicable emission limits or work practice standards, the report shall contain the specific information about the deviation that is specified at 63.1575 (d) and (e).

According to §63.150(f) and (g), a deviation is any instance in which the FCCU did not meet an applicable emission or operating limit. This includes periods of startup, shutdown, and malfunction. Deviations that occur during a period of startup, shutdown, or malfunction are not violations if the operator demonstrates to the Administrator's satisfaction they were operating in accordance with the Startup, Shutdown, and Malfunction Plan (SSMP). The SSMP must require that good air pollution control practices are used during those periods. The plan must also include elements designed to minimize the frequency of such periods (i.e., root cause analysis). The Administrator will determine whether deviations that occur during a period of startup, shutdown, or malfunction are violations, according to the provisions in §63.6(e) and the contents of the SSMP.

A copy of Chevron's compliance report for the last six months of 2010 was reviewed. During this 6 month period there were no reported deviations (excess emissions) from the 500 ppmv CO emission limit or the Opacity limit. The CO CEMS and the COMs were non-operational for a total of 46.7 hours (1.1% downtime) and 5.9 hours (0.1% downtime), respectively. The reasons for the non-operation of the CEMS and COMs are specified in the report.

REGULATION XI – SOURCE SPECIFIC STANDARDS

Rule 1105: Fluid Catalytic Cracking Units – Oxides of Sulfur

This rule is not applicable. Chevron is a NOx and SOx RECLAIM facility. Table 2 in Rule 2001 exempts SOx RECLAIM facilities from the requirements of Rule 1105.

Rule 1105.1: Reduction of PM10 and Ammonia from Fluid Catalytic Cracking Units

The purpose of this rule is to reduce emissions of PM10 and ammonia from FCCUs. It applies to all existing, new or modified FCCUs at petroleum refineries.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 59
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Emission Limits [1105(d)(1)]: This rule contains emission limits for filterable PM10 and ammonia. These emission limits are shown below. An operator must select and comply with one of the three (3) filterable PM10 emission limits.

- Filterable PM10
 - 3.6 pounds per hour, or
 - 0.005 grain per dry standard cubic foot of flue gas corrected to 3% O2 dry, or
 - 2.8 pounds per thousand barrels of fresh feed.
- Ammonia slip - 10 ppmv corrected to 3% O2 dry, averaged over 60 consecutive minutes.

An FCCU cannot be operated after December 31, 2006 unless the operator has selected one of the filterable PM emission limits and has demonstrated through source testing that the FCCU complies with the selected filterable PM10 emission limit and the ammonia emission limit. Chevron has chosen to comply with the filterable PM limit of 2.8 lb per thousand barrels of fresh feed.

Performance Test [1105.1(e)(1)]: The two most recent PM/PM10 and ammonia source tests of the FCCU regenerator stack were performed on June 10, 2009 and May 20, 2010. These source tests were reviewed. The measured filterable PM10 as averaged over the 3 test runs during both the 2009 and 2010 source tests was 2.65 lb per thousand bbls of feed and ammonia was 5.9 ppmv and 0.1 ppmv (@ 3% O2).

According to 1105.1(e)(1)(E), the operator shall establish the operating levels for each parameter of the control equipment to be monitored pursuant to 1105.1(e)(3), which requires the submission of a monitoring plan. The operator shall monitor and record, at a minimum, all operating data for each parameter, fresh feed rate, and flue gas flow rate and submit this data with the test report. The following operating data was recorded during the 2009 and 2010 source tests:

- FCCU feed rate
- Coke burn rate
- Flue gas temperature at the exhaust of the ESP
- Ammonia injection rate prior to the ESP
- Catalyst circulation rate
- Catalyst inventory
- ESP – average current (for each transformer- rectifier set)
- ESP – average voltage (for each transformer- rectifier set)
- ESP – average spark rate (for each transformer- rectifier set)

Monitoring [1105.1(e)(3)]: According to 1105.1(e)(3)(A), by May 7, 2004, an operator shall “submit a plan, for Executive Officer approval, specifying the operating parameters to be monitored, the range of operating levels of each proposed parameter, and the frequency of monitoring and recording, for the control equipment of the FCCU installed and operated before November 7, 2003.” According to 1105.1(e)(3)(C), an operator shall select the operating parameters and frequency of monitoring and recording specified in Attachment A to the rule, or as an alternative, the operator may propose other appropriate substitute parameters and frequencies.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 60
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Chevron submitted a plan on May 12, 2004 (A/N 429687). The District has not completed an evaluation of this plan.

Rule 1173: Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants

This rule is intended to control volatile organic compound (VOC) leaks from fugitive components at refineries, chemical plants, oil and gas production fields, natural gas processing plants, and pipeline transfer stations. It contains identification requirements, leak standards, inspection requirements, maintenance and repair requirements, and recordkeeping and reporting requirements for fugitive components.

The FCCU contains fugitive components that are subject to the requirements of this rule. Chevron has an existing fugitive emission component inspection and monitoring (I&M) program for compliance with the requirements of this rule. No new fugitive components will be installed under the subject change of condition applications. Compliance with the requirements of this rule is expected.

REGULATION XIII - NEW SOURCE REVIEW

As specified in Rule 1301, Regulation XIII, sets forth pre-construction review requirements for new, modified, or relocated facilities, to ensure that the operation of such facilities does not interfere with progress in attainment of the national ambient air quality standards (NAAQS), and that future economic growth within the South Coast Air Quality Management District (District) is not unnecessarily restricted. The specific air quality goal of this regulation is to achieve no net increases from new or modified permitted sources of nonattainment air contaminants or their precursors.

The South Coast Air Basin (SOCAB) is designated in attainment of the NAAQSs for CO, NO_x and SO_x. The following are currently considered nonattainment air contaminants: NO_x, SO_x, PM_{2.5}, PM₁₀, and VOC that are subject to new source review (NSR). VOC & NO_x are included since they are precursors for ozone. VOC, NO_x, and SO_x are included as PM_{2.5} and PM₁₀ precursors.

NSR requirements for these attainment pollutants are specified in the following rules:

- Rule 1303 – PM10 and VOC (all facilities); NO_x and SO_x (non-RECLAIM facilities)
- Rule 1325 – PM2.5
- Rule 2005 – NO_x and SO_x (RECLAIM facilities)

Since Chevron is a RECLAIM facility, it is subject to the NSR requirements for NO_x and SO_x specified in Rule 2005 of the RECLAIM regulation (Regulation XX). Sources that emit ammonia, CO, and Ozone Depleting Compounds (ODCs) are subject to the BACT requirements of Rule 1303.

Rule 1303: Requirements

This rule allows the Executive Officer to deny a Permit to Construct for any new, modified or relocated source which results in an emission increase of CO, PM10, VOC, any ozone depleting compound, or ammonia, unless BACT is used. This rule also requires modeling and offset (among other requirements) if there is a net increase in PM10 or VOC emissions for any new or modified source. The definition of “Source” in Rule 1302(ao) is “any permitted

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 61
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

individual unit, piece of equipment, article, machine, process, contrivance, or combination thereof, which may emit or control an air contaminant. This includes any permit unit at any non-RECLAIM facility and any device at a RECLAIM facility.”

1303(a)(1): Best Available Control Technology (BACT): Any new or modified source which results in an emission increase of CO, PM₁₀, VOC, any ozone depleting compound, or ammonia, must employ BACT for the new or relocated source or for the actual modification to an existing source. Per District policy, BACT is required for any increase in emissions that exceeds 1.0 lb per day on a maximum daily basis.

The proposed permit condition changes are not subject to BACT requirements since they do not cause an increase in the estimated emission of ammonia, CO, PM₁₀ or VOC. A summary of BACT requirements for other FCCU permitting projects described in this evaluation follows:

- *A/N 410240 for FCCU Debottleneck Project* – BACT was triggered for PM₁₀ and VOC since the project caused an emission increase of greater than one (1) lb/day of each of these non-attainment pollutants. The VOC emission increase was from the installation of new fugitive components. BACT for fugitive components such as bellows sealed valves was utilized in all non-exempt applications. The existing high efficiency ESP was determined to be BACT for control of PM₁₀ emissions from the regenerator and the existing catalyst storage vessels were already equipped with cartridge filters that were determined to be BACT for control of catalyst loading emissions.
- *A/N 433459 for new catalyst additives and associated vessels* – BACT was not triggered for the FCCU regenerator since the utilization of new catalyst additives did not cause an increase in ammonia, CO, PM₁₀ or VOC emissions from the regenerator. Each of the additive vessels were equipped with a cyclone and cartridge filter for control of PM₁₀ emissions during catalyst additive loading. These controls were determined to be BACT for the loaders.
- *A/N 457781 for revision of the FCCU VOC emission limit* – BACT was not applicable since the revision of the VOC emission limit did not cause an increase in ammonia, CO, PM₁₀ or VOC emissions from the FCCU regenerator.
- *A/N 454221 for new O₂ enrichment system* – BACT was not applicable since the installation of the O₂ enrichment system did not cause an increase in ammonia, CO, PM₁₀ or VOC emissions.
- *A/N 463981/464423 for new SCR system* – BACT for an FCCU SCR was determined to be an ammonia limit of 10 ppmv. Ammonia was already being injected for enhanced ESP performance. The permit for the FCCU regenerator had an existing NH₃ limit of 10 ppmv for Rule 1105.1. Therefore, it was determined that the installation of the SCR would not cause an increase in ammonia emissions. BACT was not applicable.
- *A/N 470768 for PRO Project related modifications* – BACT was not applicable since the project did not cause an increase in ammonia, CO, PM₁₀ or VOC emissions. This project resulted in a decrease in VOC emissions.

1303(b) – The requirements of 1303(b)(1) thru 1303(b)(4) apply to any new or modified source which results in a net emission increase of any nonattainment air contaminants. The proposed permit condition changes are not subject to the requirements described below since

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 62
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

they do not cause an increase in the estimated emission of PM₁₀ or VOC. As reviewed above, the FCCU Debottleneck Project was the only project covered in this evaluation that caused an increase in PM10 or VOC emissions large enough to trigger the 1303(b) requirements. Compliance of the FCCU Debottleneck project with these requirements is discussed below.

1303(b)(1): Modeling - The applicant must substantiate with modeling that the new facility or modification will not cause a violation, or make significantly worse an existing violation of any state or national ambient air quality standards at any receptor location in the District. According to 1306(b), the new total emissions for modified sources shall be calculated on a pound per day basis for determination of BACT and modeling applicability. It is specified in Appendix A of this rule that modeling is not required for VOC.

The 2001 final environmental impact report (FEIR) for the CARB Phase III Reformulated Project at the refinery concluded that direct operational emissions from PM10 exceeded the significance threshold of 150 lbs/day. As a result, the 2001 FEIR included air quality dispersion modeling to evaluate any potential impacts associated with the operational PM10 emissions on ambient air quality. The results of the air quality dispersion modeling concluded that the increase in PM10 emissions would not have a significant impact on ambient air quality. The scope of FCCU modifications proposed in the 2001 FEIR were significantly different than the modifications undertaken for the FCCU Debottleneck Project. These differences were covered in the addendum to the FEIR.

The estimated increase in FCCU PM10 emissions was substantially lower for the FCCU Debottleneck Project than the FCCU PM10 emission increase modeled in the 2001 FEIR. Therefore, additional PM10 modeling was not required for the Debottleneck Project.

Rule 1303(b)(2): Offsets - Unless exempt from offsets requirements pursuant to Rule 1304, emission increases shall be offset by either Emission Reduction Credits approved pursuant to Rule 1309, or by allocations from the Priority Reserve.

The PM10 and VOC emission increases for the FCCU Debottleneck Project were exempt from offset requirements per 1304(c)(4) since the source was modified “solely to comply with District, state, or federal air pollution control laws, rules, regulations or orders, as approved by the Executive Officer or designee, and provided there is no increase in maximum rating.” This project was undertaken as part of the Phase 3 of the CARB Reformulated Fuels Project at the refinery. A District policy interpretation regarding the offset exemption for CARB Reformulated Fuels projects under 1304(c)(4) states that:

“We believe that the District Governing Board’s clear intent to grant the NSR exemption to refinery constructions and modifications undertaken solely to meet state and federal mandates for clean gasoline. Other process changes that cannot be so justified should be subject to the applicable offset requirements of District’s NSR regulation. The following guidelines are designed to implement this policy.”

“We intend to consider the entire refinery as a single unit for this purpose, and apply the following two-pronged test:

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 63
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

1. Is the crude throughput capacity of the refinery unchanged as a result of the project?
2. Are the new and/or modified process units consistent with the stated refining capacity?"

Chevron provided a letter certifying that there will be not be an increase in overall refinery gasoline production resulting from the proposed FCCU modifications. As discussed previously, the proposed modifications of the FCCU to increase the FCCU throughput were undertaken to replace some of refinery gasoline production capacity lost due to previous modifications undertaken to comply with CARB III Reformulated Fuels specifications. The FCCU modifications were also undertaken for compliance with the Refinery MACT 2 (40CFR63, Subpart UUU) CO emission limit of 500 ppmv.

1303(b)(3) - Sensitive Zone Requirements: This section pertains to Emission Reduction Credits (ERCs) for facilities in the South Coast Air Basin (SOCAB). Except for credits that are obtained from the Priority Reserve, facilities are subject to the Sensitive Zone requirements (H&SC Section 40410.5) for ERCs. A facility in zone 1 may obtain ERCs originated in zone 1 only, and a facility in zone 2A may obtain ERCs from either zone 1 or zone 2A.

The sensitive zone requirements of this section were not applicable since ERCS were not required for the FCCU Debottleneck Project.

1303(b)(4) - Facility Compliance: The facility must be in compliance with all applicable rules and regulations of the District. No non-compliance issues were noted in the engineering evaluation for the FCCU Debottleneck Project.

1303 (b)(5) - Major Polluting Facilities: Any new major polluting facility or major modification at an existing major polluting facility must comply with the requirements summarized below. A major modification is defined in 1302(r) as any modification at an existing major source that will cause

- an increase of one pound per day or more, of the facility's potential to emit (PTE) for NO_x or VOC if the facility is located in the SOCAB , or
- an increase of 40 tons per year or more, of the facility's PTE for SO_x, or
- an increase of 15 tons per year or more, of the facility's PTE for PM₁₀; or,
- an increase of 50 tons per year or more, of the facility's PTE for CO.

The requirements of 1303(b)(5) are not applicable for the proposed permit condition changes since there is no increase in the estimated emission of PM₁₀ or VOC. The FCCU Debottleneck Project was a major modification that triggered these requirements since the project caused an increase of greater than one (1) lb/day of VOC.

(A) Alternative Analysis – Applicant must conduct an analysis of alternative sites, sizes, production processes, and environmental control techniques for such proposed source and demonstrate that the benefits of the proposed project outweigh the environmental and social costs associated with that project.

As specified at 1303(b)(5)(D)(iii), the requirements for an alternative analysis under this subparagraph may be met through compliance with the California Environmental Quality

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 64
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Act if the proposed project has been analyzed by an environmental impact report pursuant to Public Resources Code Section 21002.1 and Title 14 California Code of Regulations Section 15080 et seq. An alternative analysis was performed in both the 2001 FEIR and the Debottleneck Project related addendum to the FEIR. The requirements of 1303(b)(5)(A) were satisfied.

(B) Statewide Compliance: The applicant must demonstrate that all major stationary sources, as defined in the jurisdiction where the facilities are located, that are owned or operated by the applicant in the State of California are subject to emission limitations and are in compliance or on a schedule for compliance with all applicable emission limitations and standards under the Clean Air Act.

No non-compliance issues were noted in the engineering evaluation for the FCCU Debottleneck Project.

(C) Protection of Visibility - A modeling analysis for plume visibility is required if the net emission increase exceeds 15 tons/yr of PM10 or 40 tons/yr of NOx.

A PM10 modeling analysis was not required for FCCU Debottleneck Project since the increase in PM10 emissions was less than 15 ton/yr (~3.8 ton/yr).

(D) Compliance through California Environmental Quality Act – As discussed previously, the FCCU Debottleneck Project that was permitted in 2004 under A/N 410240 was part of Chevron’s CARB Phase 3 Gasoline Reformulation Project. An environment impact report (EIR) and addendum to the EIR were certified for this Gasoline Reformulation Project.

Rule 1325: Federal PM2.5 New Source Review Program

This NSR rule for PM2.5 was adopted by the District’s Governing Board on June 3, 2011. The requirements of this rule are not applicable to the permit condition changes proposed under A/Ns 502414 and 513694 since they will not cause an increase in estimated PM2.5 emissions. No other recent FCCU permitting projects were subject to this rule since it was not adopted until June of 2011.

Rule 1401: New Source Review of Carcinogenic Air Contaminants

Requirements – Rule 1401 contains the following requirements:

- 1) *(d)(1) MICR and Cancer Burden -* The cumulative increase in MICR which is the sum of the calculated MICR values for all toxic air contaminants (TAC) emitted from the new, relocated or modified permit unit will not result in any of the following:
 - (A) an increased MICR greater than one in one million (1.0×10^{-6}) at any receptor location, if the permit unit is constructed without T-BACT;
 - (B) an increased MICR greater than ten in one million (1.0×10^{-5}) at any receptor location, if the permit unit is constructed with T-BACT;
 - (C) a cancer burden greater than 0.5.
- 2) *(d)(2) Chronic Hazard Index -* The cumulative increase in total chronic HI for any target organ system due to total emissions from the new, relocated or modified permit unit will not exceed 1.0 at any receptor location.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 65
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

- 3) *(d)(3) Acute Hazard Index* - The cumulative increase in total acute HI for any target organ system due to total emissions from the new, relocated or modified permit unit will not exceed 1.0 at any receptor location.

Analysis – The permit condition changes proposed for A/Ns 502414 and 513694 do not cause an increase in estimated TAC emissions since SCR catalyst do not emit significant amounts of TACs and the permit is being modified in a manner that assures that new catalyst additives will not emit more or different TACs than currently permitted catalyst additives. Therefore, no analysis is required under this rule. The projects discussed below are the only recent FCCU permit projects that had an increase in estimated TAC emissions.

A/N 410240 for FCCU Debottleneck Project – The FCCU Debottleneck Project, which caused an increase in the estimated emission of several organic and inorganic TACs, passed a Tier II Screening Health Risk Assessment. Therefore, compliance with the rule was achieved.

A/N 433459 for new catalyst additives and associated vessels – this project, which caused an increase in copper compounds and vanadium pentoxide from the FCCU regenerator and the catalyst additive vessels, passed a Tier II Screening Health Risk Assessment. Therefore, compliance with the rule was achieved.

REGULATION XVII - PREVENTION OF SIGNIFICANT DETERIORATION (PSD)

The PSD program is the federal New Source Review (NSR) program for pollutants for which an area is in attainment with or unclassified with respect to a National Ambient Air Quality Standard (NAAQS) as well as greenhouse gases (GHG).

Rule 1703 – PSD Analysis (& Associated Rules 1701, 1702, 1704, 1706, 1710 & 1713)

These rules contain the PSD requirements for attainment pollutants and selected unclassified pollutants. As discussed earlier, SOCAB is currently designated as attainment with NAAQSs for SO₂, NO₂, CO, and Lead. On March 3, 2003, AQMD’s PSD delegation was rescinded by EPA. AQMD and EPA signed a “Partial PSD Delegation Agreement” effective July 11, 2007. According to a memo from Mr. Mohsen Nazemi, who is the Deputy Executive Officer of the AQMD Engineering and Compliance Division, this Partial Delegation Agreement is “intended to delegate the authority and responsibility to AQMD for issuance of initial PSD permits and for PSD permit modifications where the applicant does not seek to use the emissions calculation methodologies promulgated in 40 CFR 52.21 (NSR Reform) but not set forth in AQMD Regulation XVII.”

There is no increase in emissions for the permit condition changes proposed under A/Ns 502414 and 513694. Therefore, PSD permitting requirements are not applicable. The FCCU Debottleneck Project and the PRO Project were the only recent FCCU projects that were potentially subject to the requirements of this regulation. EPA performed the PSD applicability determination for the FCCU Debottleneck Project that was permitted in 2004. In a January 27, 2004 letter from Mr. Gerardo Rios of EPA Region IX, EPA specified that the “proposed projects are not PSD major modifications and thus are not subject to PSD permitting requirements”.

At Chevron’s request, EPA also performed the PSD applicability determination for their PRO Project. As stated in a September 8, 2009 letter from Gerardo Rios of EPA to Neal Truong of

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 66
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Chevron, EPA has concluded “that the PRO Project will not result in a significant emissions increase and therefore will not result in a PSD major modification”. Therefore, the project is not subject to PSD permitting requirements.

Rule 1714 – Prevention of Significant Deterioration for Greenhouse Gases

This rule sets forth preconstruction review requirements for greenhouse gases (GHG), which is defined as an aggregate group of six GHGs: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. This rule was adopted on November 5, 2010, therefore, it did not exist during the previous FCCU permitting projects covered in this evaluation.

For the proposed change of condition applications, the pollutant GHG is subject to requirements under this regulation if either of the following apply:

- A stationary source, which is an existing major stationary source for a regulated non-GHG NSR pollutant, has an emissions increase of at least 75,000 tpy CO₂e and also an emissions increase of a regulated NSR pollutant.
- A stationary source, which is an existing major stationary source that emits or has the potential to emit 100,000 tpy CO₂e, undertakes a physical change or change in the method of operation that will result in an emissions increase of 75,000 tpy CO₂e or more.

The requirements of this rule are not applicable to the proposed permit condition changes since they will not cause an increase in GHG emissions.

REGULATION XX - REGIONAL CLEAN AIR INCENTIVES MARKET (RECLAIM)

RECLAIM is a market incentive program designed to allow facilities flexibility in achieving emission reduction requirements for Oxides of Nitrogen (NO_x), and Oxides of Sulfur (SO_x). The Chevron Refinery (ID 800030) is a Cycle II RECLAIM facility.

Rule 2005: New Source Review for RECLAIM

This rule sets forth pre-construction review requirements for new facilities subject to the requirements of the RECLAIM program, for modifications to RECLAIM facilities, and for facilities which increase their allocation to a level greater than their starting Allocation plus non-tradable credits.

According to this rule [Rule 2005(c)], a permit to construct (RECLAIM Facility Permit Amendment) cannot be approved for installation of a new source or modification of an existing source that results in an emission increase of NO_x or SO_x at an existing RECLAIM unless the following requirements are met:

- 1.) Best Available Control Technology is applied to the source [2005(c)(1)(A)]
- 2.) The operation of the source will not result in a significant increase in the air quality concentration for NO₂ as specified in Appendix A [2005(c)(1)(B)], and
- 3.) The applicant demonstrates that the facility holds sufficient RECLAIM Trading Credits to offset the annual emission increase for the first year of operation at a 1-to-1 ratio [2005(c)(2)].

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 67
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

The requirements of this rule are not applicable for the permit condition changes proposed for A/Ns 502414 and 513694 since they will not impact regenerator NO_x and SO_x emissions. None of the recent FCCU permitting projects were subject to the requirements of this NSR rule since they did not cause an increase in NO_x or SO_x emissions.

Rule 2011: Requirements for Monitoring, Reporting, and Recordkeeping for Oxides of Sulfur (SO_x) Emissions and Rule 2012: Requirements for Monitoring, Reporting, and Recordkeeping for Oxides of Nitrogen (NO_x) emissions

The FCCU is subject to the Major SO_x Source and Major NO_x Source requirements of these rules. It is specified at Rule 2011: Appendix A, Chapter 2.A.3 and Rule 2012: Appendix A, Chapter 2.A.1. that the Facility Permit holder of each major SO_x and NO_x equipment shall install, calibrate, maintain, and operate an approved CEMS to measure and record the following:

- Sulfur oxide concentrations in the gases discharged to the atmosphere
- Nitrogen oxide concentrations in the gases discharged to the atmosphere
- Oxygen concentrations if required for calculation of the stack gas flow rate
- Stack gas volumetric flow rate

These sections also specify that calculation of stack gas volumetric flow rate using one of the following alternative methods is acceptable: heat input, oxygen mass balance, or nitrogen mass balance. The Chevron CEMS utilizes an approved nitrogen mass balance methodology to calculate exhaust gas flow. The CEMS measures and records the following variables, which are required to calculate the exhaust flow: main blower air flow rate, purge air flow rate to the east and west ESP meters, and exhaust gas O₂, CO, and CO₂ concentrations.

Under AN 410242, Chevron removed the existing FCCU CO boiler from service during the turnaround in Jan.-Feb. of 2005. Following removal of the CO Boiler, exhaust from the existing ESPs is vented to the atmosphere through the existing auxiliary K-25 stack. Chevron moved the NO_x/SO_x CEMS from the CO Boiler Stack to the K-25 stack. Since the subject CEMS were modified, it was required that they be recertified. Chevron received initial approval of the modified CEMS on February 17, 2005.

The measurement range of the RECLAIM NO_x and SO_x CEMS for the FCCU have subsequently been lowered due to the lower NO_x and SO_x emission limits of the consent decree. The current ranges for the analyzers are: NO_x analyzer (0 – 100 ppm range), SO_x analyzer (0 – 100 ppm range) and O₂ Analyzer (wet and dry; 0 – 10%). According to Peter Ko of the Districts Source Test Group, Chevron has submitted the required application for the modified CEMS and performed the required certification testing. Final approval for the CEMS is pending review of the certification test.

REGULATION XXX – TITLE V PERMITS

The initial Title V permit for the refinery was sent to Chevron on September 29, 2009 with an effective date of October 12, 2009. The permit for the SCR will be issued as a revision of the Title V permit. Permit revisions are categorized into the following four types: *administrative, minor, de minimis significant and significant*. The review and distribution requirements for each revision type are summarized in the following table.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 68
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Title V Permit Revisions: Review and Distribution Requirements

Revision Type	Permit Review and Distribution Requirements		
	EPA Review (45-day)	Public Notice (30-day)	Send Final Permit to EPA
Administrative	No	No	Yes
Minor	Yes	No	Yes
De Minimis Significant	Yes	No	Yes
Significant	Yes	Yes	Yes

As defined in Rule 3000, a minor Title V permit revision is any revision that:

- (1) does not require or change a case-by-case evaluation of: reasonably available control technology (RACT) pursuant to Title I of the federal Clean Air Act; or maximum achievable control technology (MACT) pursuant to 40 CFR Part 63, Subpart B;
- (2) does not violate a regulatory requirement;
- (3) does not require any significant change in monitoring terms or conditions in the permit;
- (4) does not require relaxation of any recordkeeping, or reporting requirement, or term, or condition in the permit;
- (5) does not result in an emission increase of RECLAIM pollutants over the facility starting Allocation plus nontradeable Allocations, or higher Allocation amount which has previously undergone a significant permit revision process;
- (6) does not result in an increase in emissions of a pollutant subject to Regulation XIII - New Source Review or a hazardous air pollutant;
- (7) does not establish or change a permit condition that the facility has assumed to avoid an applicable requirement;
- (8) is not an installation of a new permit unit subject to a New Source Performance Standard (NSPS) pursuant to 40 CFR Part 60, or a National Emission Standard for Hazardous Air Pollutants (NESHAP) pursuant to 40 CFR Part 61 or 40 CFR Part 63; and,
- (9) is not a modification or reconstruction of an existing permit unit, resulting in new or additional NSPS requirements pursuant to 40 CFR Part 60, or new or additional NESHAP requirements pursuant to 40 CFR Part 61 or 40 CFR Part 63; or,
- (10) incorporates an existing general permit, as defined in subdivision (e) of Rule 3004, and its associated requirements, into another Title V permit.

This Title V permit revision meets all of the requirements above so it is a minor revision. Chevron has submitted Title V permit revision A/Ns 512104 and 513759 for processing of this Title V permit minor revision, which will be sent to EPA for a 45-day review. The revision will be processed under A/N 512104. Public notice is not required.

RECOMMENDATION:

Based on the foregoing evaluation, it is expected that the subject application will comply with all applicable District Rules and Regulations. It is recommended that, a Permit to Operate, Section D of the RECLAIM/Title V facility permit, be issued for the FCCU, FCCU APCS and FCCU SCR under A/Ns 513694, 479168 and 502414, respectively.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 69
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Appendix A: Post-Modification (Current) VOC Emission Estimate for Fugitive Components

Equipment Type	Service	No. of Sources	VOC Emission Factors lbs/yr*	Annual VOC Emission lb/yr
Valves - Sealed Bellow	Gas/Vapor	285	0.00	0.0
	Light Liquid	904	0.00	0.0
	Heavy Liquid	3	0.00	0.0
Valves - Low emission ≤ 500 ppmv, or Live loaded w/ dual seal system	Gas/Vapor	389	4.55	1770.0
	Light Liquid	1389	4.55	6920.0
	Heavy Liquid	2046	4.55	9309.3
Flanges	Light Liquid/Vapor	5962	6.99	41674.4
	Heavy Liquid	4290	6.99	29987.1
Connectors	Light Liquid/Vapor	10879	2.86	33113.9
	Heavy Liquid	4224	2.86	12080.6
Pumps	Light Liquid (double seal)	40	46.83	1873.2
	Light Liquid (sealless type)	0	0	0.0
	Heavy Liquid (single seal)	22	17.21	378.6
Compressors	Gas/Vapor	2	9.09	18.2
PRV's	All (To Atmosphere)	0	9.09	0.0
	All (Closed Vent)	124	0	0.0
Drains (with p-trap)	All	204	9.09	1854.4

Total Emissions **135,988 lb/yr**
 Total
 Emissions **377.7 lb/day**
 (30-day Avg.)

* Emission factors based on correlation equations from the *California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities* (CARB/CAPCOA - 1999)

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 70
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Appendix B: FCCU (A/N 470768)
Pre-Modification VOC Emission Estimate for Fugitive Components

Equipment Type	Service	No. of Sources	VOC Emission Factors lbs/yr (1)	Annual VOC Emission lb/yr
Valves - Sealed Bellow	Gas/Vapor	895 (2)	0.00	0.0
	Light Liquid	0	0.00	0.0
	Heavy Liquid	0	0.00	0.0
Valves - Low emission ≤ 500 ppmv, or Live loaded w/ dual seal system	Gas/Vapor	389	23	8947
	Light Liquid	1525	19	28975
	Heavy Liquid	2046	3	6138
Flanges	Light Liquid/Vapor	25715 (3)	1.5	38573
	Heavy Liquid	0	1.5	0.0
Connectors	Light Liquid/Vapor	0	1.5	0.0
	Heavy Liquid	0	1.5	0.0
Pumps	Light Liquid (double seal)	39	104	4056
	Light Liquid (sealless type)	0	0	0.0
	Heavy Liquid (single seal)	22	80	1760
Compressors	Gas/Vapor	2	514	1028
PRV's	All (To Atmosphere)	0	1135	0.0
	All (Closed Vent)	0 (4)	0	0.0
Drains (with p-trap)		0 (4)	80	0.0

Total Emissions **89,477 lb/yr**
 Total Emissions **248.6 lb/day**
 (30-day Average)

- (1) Emission factors developed for CARB Reformulated Fuels Projects.
- (2) Chevron did not provide a split of bellows sealed valves by service (No impact on emission estimate)
- (3) Chevron provided a total count of flanges & connectors in all services (No impact on emission estimate)
- (4) Chevron did not provide a count of PRVS (No impact on emissions estimate since all PRVs vent to VRS).

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 71	PAGE 71
	APPL. NO. 502414, etc.	DATE 7/29/11
	PROCESSED BY: Robert Sanford	CHECKED BY:

Appendix B: FCCU (A/N 470768)
Post-Modification VOC Emission Estimate for Fugitive Components

Equipment Type	Service	No. of Sources	VOC Emission Factors lbs/yr (1)	Annual VOC Emission lb/yr
Valves - Sealed Bellow	Gas/Vapor	285	0.00	0.0
	Light Liquid	904	0.00	0.0
	Heavy Liquid	3	0.00	0.0
Valves - Low emission ≤ 500 ppmv, or Live loaded w/ dual seal system	Gas/Vapor	303	23	6969
	Light Liquid	1389	19	26391
	Heavy Liquid	2046	3	6138
Flanges	Light Liquid/Vapor	5962	1.5	8943
	Heavy Liquid	4290	1.5	6435
Connectors	Light Liquid/Vapor	10879	1.5	16319
	Heavy Liquid	4224	1.5	6336
Pumps	Light Liquid (double seal)	40	104	4160
	Light Liquid (sealless type)	0	0	0.0
	Heavy Liquid (single seal)	22	80	1760
Compressors	Gas/Vapor	2	514	1028
PRV's	All (To Atmosphere)	0	1135	0.0
	All (Closed Vent)	124	0	0.0
Drains (with p-trap)		0	80	0.0

Total Emissions **84,479 lb/yr**
 Total Emissions **234.7 lb/day**
 (30-day Average)

* Emission factors developed for CARB Reformulated Fuels Projects.