Conversion of MTBE Plant to C_4 SHU without PC

COMPANY NAME: Chevron Products Company
El Segundo Refinery

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

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

CONTACT PERSON: R. Mélida Escalante-Henricks
Permitting Engineer
Health, Environmental and Safety Department

SECTION D/H: FACILITY DESCRIPTION AND EQUIPMENT SPECIFIC CONDITIONS

EQUIPMENT DESCRIPTION:

Process 9/System 1 in Section D will be renamed as Selective Hydrogenation and C_4 Selective Hydrogenation Unit. The following equipment under Process 9/System 1 will be moved from Section H to Section D in the Title V permit. Additions and deletions are noted in underlines and ~~strikeouts,~~ respectively. The current equipment under Process 9/System 1 will be deleted from Section H in the Title V permit.

FACILITY PERMIT SECTION D					
Equipment	**ID No.**	**Connected To**	**RECLAIM Source Type**	**Emission* And Requirements**	**Conditions**
Process 9: ~~OXYGENATES PRODUCTION~~ SELECTIVE HYDROGENATION					P13.1
System 1: ~~MTBE PLANT~~ C4 SELECTIVE HYDROGENATION UNIT					S13.2, S15.7, ~~S15.8,~~ S15.10, S31.14
~~REACTOR, R-201, HEIGHT: 50 FT ; DIAMETER: 9 FT~~ ~~A/N:~~	~~D710~~				
COLUMN, WASH, C-200, FEED WATER, HEIGHT: 80 FT **6 IN**; DIAMETER: 9 FT 6 IN A/N: ~~290190~~**448302** ~~Permit to Construct Issued: 05/01/95~~	D712				
~~COLUMN, DISTILLATION, C-210, HEIGHT: 118 FT 6 IN; DIAMETER: 8 FT 6 IN~~ ~~A/N:~~	~~D713~~				

FACILITY PERMIT SECTION D					
Equipment	**ID No.**	**Connected To**	**RECLAIM Source Type**	**Emission* And Requirements**	**Conditions**
Process 9: ~~OXYGENATES PRODUCTION~~ SELECTIVE HYDROGENATION					P13.1
System 1: ~~MTBE PLANT~~ C4 SELECTIVE HYDROGENATION UNIT					S13.2, S15.7, ~~S15.8,~~ S15.10, S31.14
~~COLUMN, STRIPPER, C-221, METHANOL, HEIGHT: 67 FT ; DIAMETER: 8 FT~~ ~~A/N:~~	~~D714~~				
DRUM, DEGASSING, V-204, ~~HEIGHT~~ **LENGTH**: 15 FT ; DIAMETER: 5 FT A/N: ~~290190~~**448302** ~~Permit to Construct Issued: 05/01/95~~	D715				
~~DRUM, V-210, DISTILLATION COLUMN REFLUX, HEIGHT: 16 FT ; DIAMETER: 7 FT~~ ~~A/N:~~	~~D716~~				
~~FILTER, FEED, K-200~~ ~~A/N:~~	~~D720~~				
~~COLUMN, EXTRACTOR, C-220, METHANOL, HEIGHT: 69 FT ; DIAMETER: 7 FT~~ ~~A/N:~~	~~D721~~				
REACTOR, SELECTIVE HYDROGENATION, R-270, HEIGHT: 24 FT ; DIAMETER: 6 FT 6 IN A/N: ~~290190~~**448302** ~~Permit to Construct Issued: 05/01/95~~	D3009				
VESSEL, COALESCER, V-270, WATER, HEIGHT: 7 FT 4 IN; DIAMETER: 2 FT A/N: ~~290190~~**448302** ~~Permit to Construct Issued: 05/01/95~~	D3010				
~~DRUM, REFLUX, V-221, METHANOL, HEIGHT: 8 FT ; DIAMETER: 4 FT~~ ~~A/N:~~	~~D3416~~				
FUGITIVE EMISSIONS, MISCELLANEOUS A/N: ~~290190~~**448302** ~~Permit to Construct Issued: 05/01/95~~	D3638			**HAP**: (10) [**40CFR 63 Subpart CC, #5A, 6-23-2003**]	H23.19
~~VESSEL, V-220, WATER COALESCER, HEIGHT: 27 FT ; DIAMETER: 7 FT~~ ~~A/N:~~	~~D3831~~				

Note: See Appendix B for other devices that were installed/constructed in connection with the above permit units and would not be identified or described in the permit per refinery permitting guidelines.

- CONDITIONS –

New are noted in bold & underlines. Additions are noted in bold and deletions in strikeouts.

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 : 9]

SYSTEM CONDITIONS:

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 9, System 1, 2]

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 9, System 1, 2]

~~S15.8 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.~~

~~This process/system shall not be operated unless the vapor recovery system(s) and/or flare 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 9, System 1]~~

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 9, System 1 , 2]

S31.14 The following BACT requirements shall apply to VOC service fugitive components associated with the devices that are covered by application number(s) 284288, 284290, 289724, 290190, 292674, 326619, 329314 and 403039:

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, shall be bellows seal valves for 2-inch and smaller sizes, 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.

All new valves greater than 2-inch 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 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.

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.

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 five 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 9, System 1 , 2]

DEVICE CONDITIONS:
H. Applicable Rules

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 : D3638]

Additionally, the following conditions will be administratively modified as shown below to reflect the new name for Process 9/System 1.

S18.8 All affected devices listed under this process/system shall be used only to receive, recover and/or dispose of vent gases routed from the system(s) or process(es) listed below, in addition to specific devices identified in the "connected to" column:

Crude Distillation (Process: 1, System: 17)
Delayed Coking (Process: 2, System: 1)
Hydrotreating (Process: 4, System: 3 & 5)
Catalytic Reforming (Process: 5, System: 1)
Air Liquide Hydrogen Plant (ID 148236) (Process: N/A, System: N/A)
Hydrocracking (Process: 7, System: 4 & 7)
~~Oxygenates Production~~ **Selective Hydrogenation** (Process: 9, System: 1)
LPG Production (Process: 10, System: 4)
Treating and Stripping Process (Process: 12, System: 10, 12 & 24)
Storage Tanks (Process: 16, System: 4 & 8)

Air Pollution Control (Process: 20, System: 28, 29, 30 & 37)
Miscellaneous (Process: 21, System: 16)

[**RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(b)(2)-Offset, 5-10-1996**]
[Systems subject to this condition : Process 20, System 12 , 31]

S18.14 All affected devices listed under this process/system shall be used only to receive, recover and/or dispose of vent gases routed from the system(s) or process(es) listed below, in addition to specific devices identified in the "connected to" column:

Crude Distillation (Process: 1, System: 17)
Hydrotreating (Process: 4, System: 3 & 5)
Catalytic Reforming (Process: 5, System: 1)
Air Liquide Hydrogen Plant (ID 148236) (Process: N/A, System: N/A)
Hydrocracking (Process: 7, System: 4 & 7)
~~Oxygenates Production~~ **Selective Hydrogenation** (Process: 9, System: 1)
Treating and Stripping Process (Process: 12, System: 10, 12 & 24)
LPG Loading/Unloading (Process: 14, System: 5)
LPG/Pentane Loading and Unloading (Process: 14, System: 28)
Storage Tanks (Process: 16, System: 4 & 8)

[**RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(b)(2)-Offset, 5-10-1996**]
[Systems subject to this condition: Process 20, System 28 , 29 , 30 , 37]

COMPLIANCE RECORD REVIEW:

The AQMD's compliance database shows that Chevron El Segundo Refinery has been cited with 8 Notices of Violation and one Notice to Comply within the last two years. Appendix A includes a list of the citations. All of the NOVs and NCs have been resolved to the satisfaction of the Executive Officer. No NOV or NC was issued to the MTBE Plant.

PERMIT HISTORY REVIEW:

AN 178648
Chevron Products Company El Segundo Refinery submitted an application to build a new MTBE plant in the Refinery's FCCU Division on November 18, 1988. The process fee was paid according to the Schedule C. The BCAT number was 301701 which was for "CHEMS., MISC. ORGAN., REACTION ORGAN ADD". This plant would produce MTBE by chemically reacting methanol and isobutylene from the FCCU and Coker olefin streams. The production rate was 2100 BPOD. During the review of the application by the District, Chevron began evaluating the possibility of locating the MTBE plant in the Isomax Division and requested that the application be put on hold. On December 28, 1989, Chevron proposed that the MTBE plant be constructed by converting the existing Partial Oxidation (POX) plant, located in the Refinery's Isomax Division. Chevron requested that AN 178648 be processed and issuance of a PC. The PC was granted on June 8, 1990. The net increase in ROG emission was estimated at 17 lbs/day. The cumulative ROG emissions did not exceed the Rule

1303 (Amended July 12, 1985) threshold limit which was 75 lbs/day. The MTBE plant was constructed and operated. No PO was issued under this application.

AN 235970

The District received this new application to modify the MTBE plant in order to supply methanol and water to a new Tertiary Amyl Methyl Ether (TAME) plant on August 28, 1990. There were also some minor changes that Chevron wanted to include in the PC modification. The processing fee was paid according to the Schedule F. The BCAT number was 429560 for the MTBE Production. This PC superseded the existing PC of the MTBE plant under AN 178648. The net increase in ROG emission was updated and estimated as 18 lbs/day using the actual count of the fugitive components installed for the original PC and the proposed count of the fugitive components for this modified PC. The cumulative ROG emissions also did not exceed the threshold limit. The PC modification was granted on November 26, 1991. The modification proposed in AN 235970 never started. On March 18, 1993, Chevron requested the cancellation of AN 235970. Since the original PC A/N 178648 was already cancelled, AN 235970 was not cancelled but instead being used to issue PO for the MTBE plant. The ROG emissions of 17 lbs/day based on AN 178648 engineering evaluation was entered in NSR program.

AN 290190

Chevron submitted an application to modify the permit for the MTBE plant to add C_4 selective hydrogenation equipment to the unit on February 18, 1994. This modification was part of the program to comply with the requirements of the Federal 1990 Clean Air Act Amendments (CAAA) and the California Air Resources Board (CARB) Phase II Reformulated Gasoline Regulations. The permit to construct was issued on May 1, 1995, and it is the current permit for the MTBE plant. The equipment permitted under AN 290190 included Selective Hydrogenation Reactor R-270 (D3009) and Water Coalescer V-270 (D3010). The fugitive emission was estimated to increase by 1.7 lb/day (Calculated using the controlled emission factors) due to the addition of the C_4 selective hydrogenation section. However, the offsets were exempt per Rule 1304 (e)(4) (Amended September 11, 1992), the Regulatory Compliance. The construction of C_4 selective hydrogenation equipment finished on February 10, 1996. No PO was issued under this application.

AN 448302

With the implementation of Chevron's CARB Phase III Clean Fuels and MTBE Phase-out Project, the production of MTBE in the MTBE plant was shut down on November 29, 2002 and most of the MTBE unit equipment were either taken out of service or reused in other process system. The devices remained in the MTBE Plant include Feed Wash Column C-200 (D712), Degassing Drum V-204 (D715), Selective Hydrogenation Reactor R-270 (D3009) and Water Coalescer V-270 (D3010). Chevron submitted AN 448302 to modify the MTBE plant to reflect this change on August 8, 2005 and stated that the modification should be considered administrative for equipment removal. There were no increases in emissions as a result of this change. The equipment remained in the system were functioning in their original permitted manner. On September 28, 2006, the District Engineer Emmanuel Ruivivar wrote in a Memo to File that this application AN 448302 would be treated as an application for Permit to Operate a new process system without a PC. The new process would be named as Selective Hydrogenation Unit (SHU) and the new system would be C_4 Selective Hydrogenation Unit per Chevron's request.

PROCESS DESCRIPTION:

MTBE plant was first built to produce MTBE in the early 1990s. The C_4 SHU was later added into the MTBE plant to comply with the Federal and state rules and regulations. The C_4 SHU removes C_4-C_5 dienes, including butadiene, in the mixed butanes steam feeding the MTBE Unit and the Alkylation unit. This is accomplished by converting these compounds to olefins by selective hydrogenation process. The selective hydrogenation will minimize acid consumption in the Alkylation Unit as well as remove butadiene from these two units. After the shutdown of the MTBE production section of the MTBE plant, the C_4 SHU operation remains in operation to treat the mixed butanes stream. The service for the equipment in the C_4 SHU does not change. The only difference is that the effluent of the C_4 SHU previously sent to both MTBE production section of the MTBE plant and Alkylation Plant is presently routed to the Alkylation Plant only.

The C_4 SHU feed wash system, which consists of a Feed Water Wash Column (C-200) and a Water Coalescer (V-270), receives the butane olefin from the Fluidized Catalytic Cracking Unit and Coker Unit via P-5800/A, the C_4 SHU feed pumps, located at the Alkylation Unit Offplot Manifold. The water removes any nitrogen containing compounds and mental ions that may be present in the feed. These compounds will contaminate the catalyst in the C_4 SHU Reactor R-270, which will shorten catalyst life and reduce conversion of dienes to olefins. The coalescer removes any entrained water that may be present in the feed. It is necessary since free water is a catalyst poison. From the bottom of C-200 and side of V-270, waste water is drawn and sent to the Degassing Drum V-204. The degassed water is pumped by pump P-204/A and used in other process units. The washed butane from the outlet of Coalescer V-270 is heated by Feed/Effluent Exchangers E-273A/B/C. The butane is further heated to the reactor feed temperature by Feed Steam Preheater E-274. The heated butane is fed to C_4 SHU Reactor R-270. Reactor R-270 selectively hydrogenates the butane feed in order to covert the dienes to olefins to reduce the acid consumption in the Alkylation unit. This process consumes hydrogen which is controlled by FC-335. Exiting the top of the reactor, the reactor effluent is cooled in Feed/Effluent Exchangers E-273A/B/C. This cooled butane is then routed to the Alkylation unit.

The feed rate to the C_4 SHU didn't change with the shutdown of the MTBE plant. The feed wash column C-200 and reactor R-270 are designed for 15,000 BPD of feed. It is consistent with the production rate of 2100 BPD MTBE.

The process vents are discharged to the refinery fuel gas system via the Isomax Flare Gas Recovery 2 (Systems 28, 29, 30) or Flare Gas Recovery 3 (System 37) units as indicated in S18.14. The Flare Gas Recovery 2 and 3 units include three "Hi-Jet" high pressure water-driven ejectors and two motor-driven reciprocating compressors, respectively. In emergencies, process vents go to the Isomax flare (System 31) as indicated in S18.8. The locations of the process vents in C_4 SHU are shown in Table 1.

All the equipment described in Process 9/System 1 of Chevron's Facility Permit after the PC of AN 290190 was granted on May 1, 1995 is shown in Table 2. Most of the equipment in the MTBE plant were taken out of service or reused in other process system after the shutdown of the MTBE production. The current status of each piece of equipment is shown in the last column in Table 2. Among a total of 14 piece of equipment described in the permit, seven were taken out of service; two were reused and moved to Process 7/System 7 (Hydrocracking, Isomax Depentanizer Unit, AN

385371); and five will be kept in the new Process 9/System 1 and moved to Section D of the Facility Permit under the PO of AN 448302. The complete list of the equipment in the C_4 SHU and the updated set of P&ID are provided by Chevron in Appendix B.

Table 1. Locations of process vents in C_4 SHU

Location of Process Vent	Identification	Size
C-200	PSV MTBE C200	1½" x 2"
V-204	Process Vent	3"
V-270	PSV 3019	1" x 2"
V-270 Outlet	C_4 Sample Connection	½"
C-200 Inlet	C_4 Sample Connection	¾"
Line to Alkylation Plant	C_4 Sample Connection	¾"

Table 2. Equipment status of Oxygenates Product/MTBE Plant after the shutdown of MTBE production

Equipment	ID No.	Status
Process 9: OXYGENATES PRODUCTION		
System 1: MTBE PLANT		
REACTOR, R-201, HEIGHT: 50 FT ; DIAMETER: 9 FT	D710	OUT OF SERVICE
COLUMN, WASH, C-200, FEED WATER, HEIGHT: 80 FT ; DIAMETER: 9 FT 6 IN	D712	MOVE TO SECTION D
COLUMN, DISTILLATION, C-210, HEIGHT: 118 FT 6 IN; DIAMETER: 8 FT 6 IN	D713	ALREADY IN P7S7
COLUMN, STRIPPER, C-221, METHANOL, HEIGHT: 67 FT ; DIAMETER: 8 FT	D714	OUT OF SERVICE
DRUM, DEGASSING, V-204, HEIGHT: 15 FT ; DIAMETER: 5 FT	D715	MOVE TO SECTION D
DRUM, V-210, DISTILLATION COLUMN REFLUX, HEIGHT: 16 FT ; DIAMETER: 7 FT	D716	ALREADY IN P7S7
FILTER, FEED, K-200	D720	OUT OF SERVICE
COLUMN, EXTRACTOR, C-220, METHANOL, HEIGHT: 69 FT ; DIAMETER: 7 FT	D721	OUT OF SERVICE
REACTOR, SELECTIVE HYDROGENATION, R-270, HEIGHT: 24 FT ; DIAMETER: 6 FT 6 IN	D3009	MOVE TO SECTION D
VESSEL, COALESCER, V-270, WATER, HEIGHT: 7 FT 4 IN; DIAMETER: 2 FT	D3010	MOVE TO SECTION D
KNOCK OUT POT, RELIEF, V-205, HEIGHT: 30 FT ; DIAMETER: 10 FT	D3030	OUT OF SERVICE
DRUM, REFLUX, V-221, METHANOL, HEIGHT: 8 FT ; DIAMETER: 4 FT	D3416	OUT OF SERVICE
FUGITIVE EMISSIONS, MISCELLANEOUS	D3638	MOVE TO SECTION D
VESSEL, V-220, WATER COALESCER, HEIGHT: 27 FT ; DIAMETER: 7 FT	D3831	OUT OF SERVICE

PERMIT CONDITION COMPLIANCE REVIEW

Non-BACT (Bellows Seal) Valves
A final list of non-BACT valves installed under AN 290190 in the MTBE plant and the reasons that BACT valves were exempt are provide by Chevron per Condition S31.14 and shown in Table 3. BACT was not required due to the emission decrease with the shutdown of the MTBE production under AN 448302.

Table 3 Non-BACT (Bellows Seal) Valves installed under PC AN 290190

Size (inch)	Type	Operating Temperature (F)	Operating Pressure (psig)	Body Material	Application	Reason Bellows Seal Not Used
2	Letdown Valve	120	320	Steel	PV 332-C_4's to Alky	Control Valve

EMISSIONS:

Criteria Pollutant Emissions
The fugitive VOC emissions are the main air pollutants emitted from the C_4 SHU. Table 4 shows the emissions from the C_4 SHU (or post-mod emissions) calculated using actual inventory as existed today. A total of 540 fugitive components are counted in the C_4 SHU. The fugitive emission (30-day average) is estimated at 6.86 lb/day. As discussed above, the Selective Hydrogenation Reactor R-270 (D3009) and Water Coalescer V-270 (D3010) were added to the MTBE plant to create the C_4 SHU under AN 290190. The Feed Wash Column C-200 (D712) and Degassing Drum V-204 (D715) were already part of the MTBE plant before this modification. These components, previously part of the MTBE Plant, were visually inspected and inventoried as they now exist. Their total count equals to 265 as also shown in Table 4. Therefore, the net increase in components due to the addition of C_4 SHU (AN 290190) should be 275 (540 – 265) as opposed to 224 estimated for the PC AN 290190. The fugitive emission from the MTBE components is 4.16 lb/day. Based on the as-built component counts and new emission factors, the net VOC emission increase for A/N 290190 equals to 2.70 lb/day (6.86 – 4.16 lb/day) versus 1.74 lb/day previously estimated in the PC evaluation. Since the project to add C_4 SHU operation to the MTBE plant was part of the CARB Phase II Reformulated Gasoline project, offset for the emission increase was exempt by Rule 1304.

In an email regarding the VOC Emission Adjustments to Chevron CARB Phase 3 Project from Charlie Aarni's on September 17, 2004, Chevron estimated that a total number of 2173 fugitive components were removed in the MTBE shut down. As shown in Table PS-08 attached to Charlie Aarni's email and Appendix C, the components in the R-201 Feed, C-210 Feed, C-210 Overhead, C-210 Bottoms, Methanol, C4 to Alky (C-220 Overhead to Waterfall) and Relief System were reported as the part of the shutdown. It was confirmed that the fugitive emission from the C_4 SHU were not included in the total VOC reduction when the MTBE plant was reported as shutdown. This estimation is the best number available since the MTBE Plant was not inventoried before it was taken out of service. Therefore, the post-modification emission for AN 290190 (the entire MTBE plant including the addition C_4 SHU) can only be estimated from the summation of the emission from the C_4 SHU plant and the components that were removed. Table 5 shows the calculation of the estimated emission reduction due to the shutdown of the MTBE production. The emission reduction from the shutdown of the MTBE production equals to of 30.15 lb/day (30-day average). The post modification fugitive

emission of the entire MTBE plant can be estimated at 37.01 lb/day (6.86 + 30.15 lb/day) for AN 290190.

Table 4. C_4 SHU Emissions Including Emissions from Previously MTBE Plant

Source Unit		Service	Emission Factor lb/yr	Total Emissions from C_4 SHU		Components Previously Assigned MTBE Plant	
				Counts	Emission lb/yr	Counts	Emission lb/yr
Valves	Sealed bellows	All	0	112		46	
	SCAQMD Approved I&M Program	Gas/Vapor	4.55	0			
		Light Liquid	4.55	32	145.46	16	72.73
		Heavy liquid	4.55				
Pumps	Double Mechanical Seals or Equivalent Seals	Light Liquid	46.83				
Flanges	ANSI/API standards	All	6.99	148	1034.55	62	433.39
Connectors		All	2.86	149	426.35	45	128.76
PRVs	Closed vent system	All	0	4		1	
Drains	P-Trap or Seal Pot	All	9.09	95	863.51	95	863.51
Total counts				**540**		**265**	
Annual Emission, lbs/yr					**2469.87**		**1498.40**
Hourly Emission = (Annual)/(52×7×24), lb/hr					0.28		0.17
Daily Maximum= (Annual)/(52×7), lbs/day					6.79		4.12
30-day Average = (Annual)/(12×30), lbs/day					**6.86**		**4.16**

[1]Submitted by Chevron on December 18, 2012 and shown in Appendix C.

Table 5. Fugitive Emission Reduction from MTBE Shutdown (AN 448302)

Source Unit		Service	Emission Factor lb/yr	AN 448302 (estimated)[1]	
				Component removed	Emission lb/yr
Valves	Sealed bellows	All	0		
	SCAQMD Approved I&M Program	Gas/Vapor	4.55		
		Light Liquid	4.55	537	2441.06
		Heavy liquid	4.55		
Pumps	Double Mechanical Seals or Equivalent Seals	Light Liquid	46.83	11	515.08
Flanges	ANSI/API standards	All	6.99	828	5787.87
Connectors		All	2.86	737	2108.84
PRVs	Closed vent system	All	0	60	0
Drains	P-Trap or Seal Pot	All	9.09		
Total counts				**2173**	
Annual Emission, lbs/yr					**10853.00**
Hourly Emission = (Annual)/(52×7×24), lb/hr					1.24
Daily Maximum= (Annual)/(52×7), lbs/day					29.82
30-day Average = (Annual)/(12×30), lbs/day					**30.15**

[1]See email from Aarni Charlie's email correspondence dated September 17, 2004.

Toxic Air Contaminant (TAC) Emissions and Health Risk Assessment (HRA)

Since the MTBE shutdown results in a reduction in VOC emissions, no increase in TAC is expected for A/N 448302.

RULE EVALUATION:

PART 1: SCAQMD REGULATIONS

Rule 212: Standards for Approving Permits and Issuing Public Notice

Amended 11/14/97

The C_4 SHU is not located within 1000 feet of a school. A public notice was distributed for the applications related to the Reformulated Gasoline Project proposed by Chevron. The addition of C_4 SHU (permitted under AN 290190) was one of the applications. The shutdown of MTBE production permitted under AN 448302 resulted in a VOC emissions decrease of 30.15 lb/day (not BACT adjusted). There is no TAC emission increase for this system due to the shutdown of the MTBE production. Therefore, a public notice is not required.

Rule 401: Visible Emissions

Amended 11/9/01

The C_4 SHU is not expected to result in visible emissions under normal operating conditions. Compliance is expected.

Rule 402: Nuisance

Adopted 5/7/76

Nuisance complaints are not expected under normal operating conditions. Compliance is expected.

Rule 1123: Refinery Process Turnaround

Amended 12/7/90

The refinery is subject to the requirements of this rule during a process turnaround. Chevron is required to submit a compliance plan to the AQMD for review and approval if the refinery uses inert gases or vacuum eduction in a process turnaround. The C_4 SHU is expected to comply with this rule in future process turnarounds.

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

Amended 2/6/09

Chevron has an on-going Leak Detection And Repair (LDAR) program to meet all applicable requirements of the rule, such as: Identification Requirements (e), Operator Inspection Requirement (f), Maintenance Requirements (g), Atmospheric Process PRD Requirements (h), Recordkeeping and Reporting Requirements (i), and Test Methods. All of the fugitive components in C_4 SHU are expected to comply with to this rule.

REG XIII New Source Review

1301 General

Amended 12/7/95

The modifications of MTBE plant caused the issuance of VOC at the refinery. Therefore, they were subject to this rule.

1303 Requirements

Amended 12/6/02

Best Available Control Technology (BACT)

The addition of C_4 SHU (permitted under AN 290190) resulted in an increase of VOC about 2.70 lb/day. Therefore, any new or replacement fugitive components to be installed on this system were required to have BACT as indicated in S31.14. The compliance with this requirement was evaluated in the section of "PERMIT CONIDTION COMPLIANCE REVIEW**"** above**.** Compliance with this rule is

expected. The shutdown of MTBE production permitted under AN 448302 resulted in an emission decrease. BACT is not required.

Offset
See the evaluation of Rule 1304.

Modeling
The C_4 SHU system emits only VOC from its fugitive components. Modeling is not required.

1304
Amended 6/14/96

Exemptions
The emission increase due to the initial installation of the MTBE plant and the addition of C_4 SHU were exempt from offset per Regulatory Compliance section in Rule 1304 (c)(4).

Rule 1401
Amended 3/4/05

New Source Review of Toxic Air Contaminants
The C_4 SHU could emit 1,3-butadiene, which is a toxic air contaminant listed in Table 1 of Rule 1401. Therefore, the facility is subject to all applicable requirements of this rule. The application AN 448302 for the modification was deemed completed on September 15, 2005. As a result, the facility is subject to the version of this rule that was amended on March 4, 2005.

MICR and Cancer Burden
The modification to convert the MTBE plant to C_4 SHU system did not result in an increase in TAC emission. Therefore, there is no cumulative increase in MICR or cancer burden.

Chronic/Acute Hazard Index
There is also no cumulative increase in total chronic and acute hazard indices for this equipment.

The C_4 SHU is expected to comply with all applicable requirements of this rule.

REG XVII
Amended 8/13/99

Prevention of Significant Deterioration (PSD)
The proposed project will only impact VOC emissions at this facility. VOC is not an attainment pollutant for the South Coast Air Basin. Therefore, PSD analysis is not required.

REG XXX

Title V
Chevron El Segundo Refinery is subject to Reg XXX, and a Title V permit for the facility was issued on September 1, 2009. The proposed draft PO for the C_4 SHU is considered a Minor Revision under Rule 3000. The modification made to P9S1 does not require: any significant change in monitoring terms or conditions in the permit; does not require relaxation of any recordkeeping, or reporting requirement, or term, or condition in the permit; does not result in an increase in emissions of any pollutant; and

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. Accordingly, the proposed revision is subject to the 45 day EPA review process, but not subject public notification requirements under Rule 3006.

PART 2: STATE REGULATIONS

CEQA California Environmental Quality Act

The CEQA Applicability Form (400-CEQA) submitted by the applicant indicates that the project does not have any impacts which trigger the preparation of a CEQA document. The shutdown of the MTBE production has no possibility to cause a significant adverse effect on the environment. Therefore, the expected impacts of the project on the environment are not significant and preparation of an EIR is not required.

PART 3: FEDERAL REGULATIONS

40CFR 60 STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

Subpart GGG Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries for which Construction, Reconstruction, or Modification Commenced After January 4, 1983, and on or Before November 7, 2006

The equipment in C_4 SHU which are subject to this subpart include valves, pumps, pressure relief devices, sampling connectors, open-ended valves or lines. In general, the equipment leak inspection and monitoring requirements of District Rule 1173 are more stringent than requirements specified by this subpart. However, pertinent requirements of these regulations have been incorporated into Chevron's leak detection and repair (LDAR) Program for fugitive components. Compliance with the inspection, maintenance, and record keeping requirements of this regulation is expected.

40CFR 63 NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SOURCE CATEGORIES

Subpart CC National Emission Standards for Hazardous Air Pollutants From Petroleum Refineries

The C_4 SHU is subject to this regulation because its fugitive components were determined to be in "organic HAP service" as defined at §63.641 of this regulation. Chevron is required to comply with the requirements described in the Section J of the Facility Permit under 40CFR 63 Subpart CC, #5A 6-23-2003. Continued compliance with these requirements is expected.

RECOMMENDATION/CONCLUSION:

Issue Permit to Operate for the C_4 SHU subject to the conditions indicated on pages 3 to 6. The current active PC for Process 9/System 1 under AN 290190 will be cancelled.