PROPOSED

Minor Modification to a Covered Source
Review Summary

Application File No.:	0088-15
Permit No.:	0088-01-C
Applicant:	Chevron Products Company
Facility Title:	Petroleum Refinery Located at 91-480 Malakole Street, Kapolei, Oahu
Mailing Address:	Chevron Products Company 91-480 Malakole Street Kapolei, HI 96707
Responsible Official:	Mr. Edward J. Wagner Refinery Manager Chevron Products Company Ph. (808) 682-5711
Point of Contact:	Ms. Sonni Escuadro Environmental Specialist Chevron Products Company Ph. (808) 682-2372
Application Dates:	July 24, 2008

Proposed Project:

SICC 2911 (Petroleum Refining)

The Chevron Hawaii refinery's Fluidized Catalytic Cracking Unit (FCCU) is subject to the emission limits identified in Consent Decree No. C 03-04650 (CRB) Sections B and D for sulfur dioxide and carbon monoxide. The minor modification will incorporate requirements from Section B (17, c, v) and Section D (27, 28, 29) into the existing covered source permit.

For the FCCU, the following new requirements per the NSPS, MACT and the CD apply:

Requirement	40 CFR Part 63 Subparts A and UUU (MACT II)	40 CFR Part 60 Subparts A and J (NSPS)	NSR Consent Decree	Hawaii Administrative Rules (HAR)	40 CFR Part 80 and 86
PM Emission Limits	1 lb of PM /1000 lb of coke burned (does not apply during planned maintenance if pre-approved)	1 lb of PM /1000 lb of coke burned	1lb of PM /1000 lb of coke burned (3-hr average). PM emissions during periods of Startup, Shutdown or Malfunction shall not be used in determining compliance with this emission limit provided that during such periods good air pollution control practices to minimize PM emissions are implemented.		
CO Emission Limits	500 ppm	500 ppm, 1 hr average	500 ppm corrected to 0% O_2 (1-hr average) CO emissions during periods of Startup, Shutdown or Malfunction shall not be used in determining compliance with this emission limit provided that during such periods good air pollution control practices to minimize CO emissions are implemented.		
SO_2 Emission Limits			25 ppmvd SO_2 @ 0% O_2 (365 day rolling average) and 50 ppmvd SO_2 @ 0% O_2 (7 day rolling average) SO_2 emissions during periods of Startup, Shutdown or Malfunction shall not be used in determining compliance with the emission limit of 50 ppmvd SO_2 @ 0% O_2 on a 7 day rolling average basis, provided that during such periods good air pollution control practices to minimize SO_2 emissions are implemented.		
Sulfur Limits		Sulfur limit of feed - 0.30% by weight			Sulfur limit in gasoline of 80 ppm, 30 ppm (yearly average)

Opacity Limits	Opacity limits < 30%, per 6 min average, except that one 6 min average during a 60 minute period can exceed 30%	Opacity limits < 30%, per 6 min average, except that one 6 min average during a 60 minute period can exceed 30%	Opacity limits < 30%, per 6 min average, except that one 6 min average during a 60 minute can exceed 30%	Opacity limits < 20%, per 6 min average, except that one 6 min average during a 60 minute period can exceed 20% but less than 60%	
Monitoring	CO CEMS SO_2 CEMS O_2 CEMS COMS Coke burn-off rate	CO CEMS SO_2 CEMS O_2 CEMS H_2S CEMS COMS Coke burn-off rate	CO CEMS SO_2 CEMS O_2 CEMS COMS		
RATA Testing Cylinder Gas Audits (CGA)	Annual Quarterly (unless RATA done)	Annual Quarterly (unless RATA done)	Every 3 years Quarterly (unless RATA done)		
Source Performance Testing	Initial, annual	Initial, annual	Initial not required, annual		
Reporting	Semi-annual compliance	Semi-annual compliance	Semi-annual compliance after date of entry		

The permit modification application fee of $200.00 for a minor modification was submitted by the applicant and processed.

Equipment Description:

Fluidized Catalytic Cracking Unit (FCCU)
Maximum VGO feed rate - 22,000 bbls/day*
Maximum VGO sulfur content - 0.30% by weight**

* Based on a rolling 365-day average
** Based on a rolling 7-day average, applicable at all times, including periods of startup, shutdown, and malfunctions

Air Pollution Control Equipment:

The flue gas exiting the FCCU is entrained with catalyst particles. This flue gas is routed through cyclones and an electrostatic precipitator (ESP) to remove particulate matter.

Applicable Requirements:

Hawaii Administrative Rules (HAR)
Title 11, Chapter 59 Ambient Air Quality Standards
Title 11, Chapter 60.1 Air Pollution Control
- Subchapter 1 General Requirements
- Subchapter 2 General Prohibition
  - HAR 11-60.1-31 Applicability
  - HAR 11-60.1-32 Visible Emissions
  - HAR 11-60.1-37 Process Industries
  - HAR 11-60.1-38 Sulfur Oxides from Fuel Combustion
- Subchapter 5 Covered Sources

Subchapter 6 Fees for Covered Sources, Noncovered Sources, and Agricultural Burning
- HAR 11-60.1-111 Definitions
- HAR 11-60.1-112 General Fee Provisions for Covered Sources
- HAR 11-60.1-113 Application Fees for Covered Sources
- HAR 11-60.1-114 Annual Fees for Covered Sources
- HAR 11-60.1-115 Basis of Annual Fees for Covered Sources

Subchapter 8 Standards of Performance for Stationary Sources
- HAR 11-60.1-161 New Source Performance Standards

Subchapter 9 Hazardous Air Pollutant Sources
- HAR 11.60.1-174 Maximum Achievable Control Technology (MACT)Emission Standards

Federal Requirements

40 CFR Part 60 - Standards of Performance for New Stationary Sources (NSPS)
- Subpart A - General Provisions
- Subpart J - Standards of Performance for Petroleum Refineries

40 CFR Part 63 - National Emission Standards for Hazardous Air Pollutants for Source Categories (Maximum Achievable Control Technologies (MACT) Standards)
- Subpart A - General Provisions
- Subpart UUU (MACT II) - National Emission Standards for Hazardous Air Pollutants for Petroleum Refineries: Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units

Non-Applicable Requirements:

Hawaii Administrative Rules (HAR)
Title 11, Chapter 60.1 Air Pollution Control
- Subchapter 7 Prevention of Significant Deterioration

Federal Requirements
40 CFR Part 52.21 – Prevention of Significant Deterioration of Air Quality
40 CFR Part 61 - National Emission Standards for Hazardous Air Pollutants (NESHAPS)

Best Available Control Technology (BACT):

A Best Available Control Technology (BACT) analysis is required for new covered sources or significant modifications to covered sources that have the potential to emit or a net emissions increase above significant levels as defined in HAR §11-60.1-1. Since this is a minor modification, a BACT analysis is not applicable.

Prevention of Significant Deterioration (PSD):

This modification is not subject to PSD review as this modification does not increase emissions.

Consolidated Emissions Reporting Rule (CERR):

40 CFR Part 51, Subpart A - Emission Inventory Reporting Requirements, determines CER based on the emissions of criteria air pollutants from Type A and B point sources (as defined in 40 CFR Part 51, Subpart A), that emit at the CER triggering levels as shown in the table below:

Pollutant	Type A CER Triggering Levels [1,2] (tpy)	Type B CER Triggering Levels [1] (tpy)	Pollutant	In-house Total Facility Triggering Levels [3] (tpy)
NO_x	≥2500	≥100	NO_x	≥25
SO_2	≥2500	≥100	SO_2	≥25
CO	≥2500	≥1000	CO	≥250
$PM_{10}/PM_{2.5}$	≥250/250	≥100/100	PM/PM_{10}	≥25/25
VOC	≥250	≥100	VOC	≥25
Pb		≥5	Pb	≥5
			HAPS	≥5

[1] Based on actual emissions
[2] Type A sources are a subset of Type B sources and are the larger emitting sources by pollutant
[3] Based on potential emissions

The Chevron Hawaii Refinery exceeds the Type A CER triggering levels. Therefore, CER requirements are applicable.

The Clean Air Branch also requests annual emissions reporting from those facilities that have facility-wide emissions of a single air pollutant exceeding in-house triggering levels. The emissions from the Chevron Hawaii Refinery exceed the in-house triggering levels and thus annual emissions reporting is required for in-house recordkeeping purposes.

Compliance Assurance Monitoring (CAM):

No change from Covered Source Permit No. 0088-01-C.

Synthetic Minor Source:

No change from Covered Source Permit No. 0088-01-C.

Insignificant Activities:

No change from Covered Source Permit No. 0088-01-C.

Alternate Operating Scenarios:

No change from Covered Source Permit No. 0088-01-C.

Project Emissions:

Potential Emissions from FCCU

Pollutant	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
SO_2	26.2	57.37
NO_x	65.08	285.07
CO	114.6	502.0
PM_{10}	25.1	110.0
VOC	1.71	7.50
Lead	0.0013	0.0055

Notes:
1. Maximum total VGO feed rate = 22,000 bbl of feed/day
2. SO_2 = 50 ppm * 64 lb/lb-mol * 52,579 scfm * 1.557 E-07 (lb-mol/ft^3)(min/hr) = 26.2 lb/hr
3. SO_2 = 25 ppm * 64 lb/lb-mol * 52,579 scfm * 1.557 E-07 (lb-mol/ft^3)(min/hr) * 8760 hr/yr * ton/2000 lb = 57.37 tpy
4. CO = 500 ppm * 28 lb/lb-mol * 52,579 scfm * 1.557 E-07 (lb-mol/ft^3)(min/hr) * 8760 hr/yr * ton/2000 lb = 502.0 tpy
5. VOC emission based on 1.71 lb/hr from averaging 1996 and 1999 source test results
   VOC = 1.71 lb/hr * 8760 hrs/yr * ton/2000 lb = 7.50 tpy
6. NO_x emission factor from AP-42, Table 5.1-1, (1/95), FCC with ESP
   NO_x = 71 lb NO_x/1000 bbl of feed * 22,000 bbl of feed/day * day/24 hr * 8760 hr/yr * ton/2000 lb = 285.07 tpy
7. PM emission rate = 1 lb PM/1000 lb of coke * 306 lb of feed/bbl of feed * 22,000 bbl of feed/day * 8.95% lb of coke/lb of feed * day/24 hr * 8760 hr/yr * ton/2000 lb = 110.0 tpy

Hazardous Air Pollutants

Pollutant	PM_{10} (lb/hr)	(% by wt.) [1]	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
Nickel	12.5	0.017	0.0021	0.009
Selenium	12.5	0.003	0.0004	0.002
Cadmium	12.5	0.002	0.0003	0.001
Antimony	12.5	0.002	0.0003	0.001
Mercury	12.5	0.001	0.0001	0.001
Formaldehyde	n/a	n/a	0.20324 [2]	0.9 [3]
HAPS				0.914

[1] % by wt. From Air Emissions Species Manual, Volume II, Particulate Matter Species Profiles, Second Edition, pg. 257. Nickel % by wt. from actual data.

[2] lb/hr = 8.223E-05 x 58000 dscfm x 30 MW x 0.75 / 528 °R = 0.20324 lb/hr

[3] tpy = 0.20324 lb/hr x 8760 hrs/yr / 2000 lb/ton = 0.9 tpy

Air Quality Assessment:

An ambient air quality impact analysis (AAQIA) is not required for minor modifications.

Significant Permit Conditions:

1. Attachment II(I), Special Condition No. C.6.b.
   CO Emission Limit: 500 ppmvd @ 0% O_2 (1-hr average)

2. Attachment II(I), Special Condition No. C.6.c.
   SO_2 Emission Limit: 25 ppmvd @ 0% O_2 (365-day rolling average) and 50 ppmvd @ 0% O_2 (7-day rolling average)

3. Attachment II(I), Special Condition No. D.6
   Continuous Emission Monitoring System (CEMS) for O_2

   The permittee shall install, operate and maintain a continuous emissions monitoring system (CEMS) for continuously monitoring and recording the concentration by volume (dry basis) of O_2 emissions from the FCCU.

4. Attachment II(I), Special Condition No. D.7
   Continuous Emission Monitoring System (CEMS) for SO_2

   The permittee shall install, operate and maintain a continuous emissions monitoring system (CEMS) for continuously monitoring and recording the concentration by volume (dry basis) of SO_2 emissions from the FCCU.

5. Attachment II(I), Special Condition No. E.5.h.iii.(2)
   Carbon Monoxide. All 1-hour periods during which the average CO concentration, as measured by the CO continuous monitoring system under 40 CFR §60.105(a)(2), exceeds 500 ppmvd @ 0% O_2.

6. Attachment II(I), Special Condition No. E.5.h.iii.(4)
   Sulfur Dioxide. All rolling 365-day periods during which the average concentration of SO_2, as measured by the SO_2 continuous emissions monitoring system, exceeds 25 ppmvd @ 0% O_2 and all rolling 7-day periods during which the average concentration of SO_2, as measured by the SO_2 continuous emissions monitoring system, exceeds 50 ppmvd @ 0% O_2.

Conclusion and Recommendations:

Recommend issuance of the minor modification to existing Covered Source Permit No. 0088-01-C based on the additional federal permit requirements from the Consent Decree. A 45-day EPA review period is also required.

Reviewer: Darin Lum
Date: 7/09