



Mark Parkinson, Governor
Roderick L. Bremby, Secretary

DEPARTMENT OF HEALTH
AND ENVIRONMENT

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Division of Environment

AIR CONSTRUCTION PERMIT

Source ID No.: 0150004

Effective Date: September 15, 2006 (Revised December 8, 2006; May 1, 2008; and October 12, 2009)

Source Name: Frontier El Dorado Refining Company

SIC Code: 2911, Petroleum Refining

NAICS Code: 324110, Petroleum Refining

Source Location: 1401 South Douglas Road
El Dorado, Kansas 67042

Mailing Address: P.O. Box 1121
El Dorado, Kansas 67042

Contact Person: David Prucha, Senior Environmental Engineer
Telephone No. (316) 321-8263

This permit is issued pursuant to K.S.A. 65-3008 as amended; and consists of the conditions contained herein, the permit application dated March 2006, the impacts analysis dated April 2006, the permit issued September 15, 2006, the revised application submitted October 12, 2006, the revised permit issued December 8, 2006, additional information received February 27, 2008, the revised permit application received on February 23, 2009 and all revisions. In the event that any conditions, requirements, or limitations contained herein is not in exact agreement with the permit application, or any of its revisions, the conditions, requirements, and/or limitation contained herein shall control.

DIVISION OF ENVIRONMENT

Bureau of Air

Air Permitting Section

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Description of Activity Subject to Air Pollution Control Regulations

Frontier El Dorado Refining Company (FEDRC) has proposed its “Crude Expansion Project” at its petroleum refinery in El Dorado, Kansas. The Crude Expansion Project will involve major changes to the Crude and Vacuum units at the refinery to allow flexibility in handling different crude slate as well as additional crude oil processing. The permit for this project was originally issued on September 15, 2006 and revised on December 8, 2006 and May 1, 2008.

On July 30, 2007, the United States Court of Appeals, District of Columbia Circuit officially ordered a full vacature this MACT standard. The units formerly subject to this MACT standard include B-307, B-306 and B-2402. Should the units become subject to a subsequently promulgated state or federal MACT requirement, the owner or operator shall comply with the applicable provisions. The administrative revision on May 1, 2008 addressed the vacated Maximum Achievable Control Technology (MACT) standard for heater and boilers (40 CFR Part 63 Subpart DDDDD).

The Crude Expansion Project constitutes a major modification under Prevention of Significant Deterioration (PSD) [40 CFR 52.21, incorporated at K.A.R. 28-19-17]. The project emissions increase is above PSD de-minimis thresholds for PM, PM₁₀, NO_x, SO₂ and CO. Best Available Control Technology (BACT) will be installed on the new emissions units and the emissions units that will be physically or operationally modified. These include three new process heaters, modified SRU2, and a new cooling tower. The project will affect emissions from a number of downstream units.

The increase in emissions of hazardous air pollutants (HAPs) will be well below the case-by-case Maximum Achievable Control Technology (MACT) thresholds (40 CFR Part 63, Subpart A) of 10 tons/year for any single HAP and 25 tons/year for combined total HAPs for each modified refinery process unit. Therefore, the modified process units will still be subject to the existing source MACT requirements of 40 CFR Part 63, Subpart CC (Petroleum Refinery NESHAP).

Frontier requested a re-evaluation of the NO_x emission limits in a permit application received on February 23, 2009. Frontier reviewed recently issued PSD permits and determined that the NO_x emission limits set on heaters B-306, B-307 & B-2402 were set inappropriately. Frontier proposed new emission limits. KDHE reviewed Frontier’s application and has revised the emission limits accordingly.

Significant Applicable Air Regulations

The project, as proposed, is subject to Kansas Administrative Regulations (K.A. R.) relating to air pollution control. The following air quality regulations were determined to be applicable to this source:

1. K.A.R. 28-19-17 Prevention of Significant Deterioration of Air Quality.
2. K.A.R. 28-19-31 Indirect Heating Equipment Emissions – Emission Limitations.
3. K.A.R. 28-19-650(a)(3) Emissions Opacity Limits.
4. K.A.R. 28-19-720 New Source Performance Standards, which adopts 40 CFR Part 60 Subpart A, Standards of Performance for New Stationary Sources – General Provisions.
5. K.A.R. 28-19-720 New Source Performance Standards, which adopts 40 CFR Part 60 Subpart J, Standards of Performance for Petroleum Refineries.
6. K.A.R. 28-19-720 New Source Performance Standards, which adopts 40 CFR Part 60 Subpart GGG, Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries.
7. K.A.R. 28-19-720 New Source Performance Standards, which adopts 40 CFR Part 60 Subpart QQQ, VOC Emissions from Petroleum Refinery Wastewater Systems.
8. K.A.R. 28-19-735 Hazardous Air Pollutants, which adopts 40 CFR Part 61 Subpart A, National Emissions Standards for Hazardous Air Pollutants – General Provisions
9. K.A.R. 28-19-735 Hazardous Air Pollutants, National Emissions Standards for Hazardous Air Pollutants, which adopts 40 CFR Part 61 Subpart FF, National Emission Standards for Benzene Waste Operations.
10. K.A.R. 28-19-750 Hazardous Air Pollutants, Maximum Achievable Control Technology, which adopts 40 CFR Part 63 Subpart A, National Emission Standards for Hazardous Air Pollutants for Source Categories – General Provisions.
11. K.A.R. 28-19-750 Hazardous Air Pollutants, Maximum Achievable Control Technology, which adopts 40 CFR Part 63 Subpart CC, National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries.
12. K.A.R. 28-19-750 Hazardous Air Pollutants, Maximum Achievable Control Technology, which adopts 40 CFR Part 63 Subpart UUU, National Emission Standards for Petroleum Refineries: Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units.

Air Emission Unit Technical Specifications

The following equipment or equivalent is approved:

1. Revamp the Crude Unit with additional heat exchangers to the raw crude preheat train and desalted crude preheat train, upgrading the desalter systems, installing a Crude Preflash column, modifying the Crude Distillation column and pumparound systems, and increasing crude pumping capability and crude bottom products.
2. Replace Crude Unit's Heater B-301 with a new heater (B-306). Heater B-306 will have a potential annual average heater duty of 121.1 million British Thermal Units per hour (mmBtu/hr).
3. Replace Crude Unit's Heater B-304 with a new heater (B-307). Heater B-307 will have a potential annual average heater duty of 121.2 mmBtu/hr.
4. Replace the Vacuum Distillation Column, and modify the Vacuum Unit's pumparound systems, Rerun column and Stabilizer column.
5. Replace Vacuum Unit's Heater B-2401 with a new heater (B-2402). Heater B-2402 will have a potential annual average heater duty of 207.3 mmBtu/hr.
6. New Vacuum Unit's Cooling Tower with a designed cooling water circulation rate of 9,000 gallons per minute.
7. New process drains for the Vacuum Unit.
8. Modify SRU2 for oxygen enrichment and modify the existing Tail Gas Treating Unit (TGTU) as necessary to handle the increase load.
9. Install Non-Selective Catalytic Reduction control to one of the Hydrotreating Unit No. 2 (HTU2) compressors.

Air Emissions Estimates from the Proposed Activity

Pollutant	Net Increase in Emissions (tons/year)
Particulate Matter (PM)	145.87
Particulate Matter less than 10 microns in diameter (PM ₁₀)	93.18
Oxides of Nitrogen (NO _x)	141.58
Sulfur Dioxides (SO ₂)	919.11
Carbon Monoxide (CO)	190.14
Volatile Organic Compound (VOC)	20.75
Hydrogen sulfide (H ₂ S)	0.84

Air Emission Limitations

1. K.A.R. 28-19-650(a)(3): Opacity of visible emissions limited to 20% from Heaters B-307, B-306 and B-2402, the SRU Incinerator's stack and the new cooling tower.
2. 40 CFR Part 60 Subpart J: Limit H₂S in the fuel gas burned in Heaters B-307, B-306 and B-2402 to 0.10 gr /dscf.
3. 40 CFR Part 60 Subpart J and 40 CFR Part 63 Subpart UUU: SO₂ emissions limit of 250 ppm by volume (dry basis) at zero percent oxygen for the SRU Incinerator's stack.

Permit Conditions

BACT and 40 CFR Part 60 Subpart J Control Requirements for New Heaters, SRU No. 2, New Cooling Tower

The owner or operator shall comply with the following requirements on and after the date on which the initial performance test is completed, but not later than 60 days after achieving the maximum production rate at which the affected facility will be operated, or 180 days after initial startup, whichever comes first.

1. Heaters B-307, B-306 and B-2402 shall not burn any fuel gas that contains H₂S in excess of 0.10 gr/dscf [3-hour rolling average].
2. The owner or operator will limit any gases discharged into the atmosphere from the SRU Incinerator's stack to 250 ppm by volume (dry basis) of SO₂ at zero percent O₂ [12-hour rolling average].

3. Heaters B-307 and B-306 shall be equipped with ultra low-NO_x burners and shall meet a NO_x emission limit of 0.035 lb NO_x/mmBtu.
4. Heater B-2402 shall be equipped with ultra low-NO_x burners and shall meet a NO_x emission limit of 0.030 lb NO_x/mmBtu.
5. Heaters B-307, B-306 and B-2402 shall meet a carbon monoxide limit of 50 ppm by volume (dry, 3% O₂).
6. High efficiency mist eliminators designed to achieve ≤ 0.005 drift as % of total flow shall be installed, operated and maintained on the new Vacuum Unit's cooling tower.

40 CFR Part 60 Subpart J Monitoring Requirements

1. Continuous monitoring systems shall be installed, calibrated, maintained, and operated, including: [40 CFR 60.105]
 - (a) For Heaters B-307, B-306 and B-2402, an instrument for continuously monitoring and recording the concentration (dry basis) of H₂S in the fuel gas burned in these heaters. [40 CFR 60.105(a)(4)]
 - (b) For the SRUs, instruments for continuously monitoring and recording the concentration (dry, 0% O₂ basis) of SO₂ emissions and the percent of O₂ in the SRU Incinerator's stack. [40 CFR 60.105(a)(5)]

40 CFR Part 60 Subpart GGG Requirements for Equipment Components in VOC Service in Crude and Vacuum Units

1. The fugitive components within the Crude and Vacuum Units that are subject to 40 CFR Part 63 Subpart CC (Petroleum Refinery NESHAP) and are also subject to 40 CFR Part 60 Subpart GGG are required to comply only with 40 CFR Part 63 Subpart CC. [40 CFR 63.640(p)].
2. The owner or operator shall demonstrate compliance with the requirements of 40 CFR Part 60 Subpart GGG for all related equipment within 180 days of initial startup. The owner or operator shall meet the standards by complying with 40 CFR part 60 subpart VV, as referenced in 40 CFR 60 Subpart GGG.

40 CFR Part 60 Subpart QQQ and 40 CFR Part 61 Subpart FF Requirements for Crude Expansion Project Wastewater System:

1. The owner or operator shall demonstrate compliance with the applicable requirements of 40 CFR Part 60 Subpart QQQ for all related equipment within 180 days of its initial startup.

2. The owner or operator shall continue demonstrating compliance with the applicable requirements of 40 CFR Part 61 Subpart FF for all related equipment at the site.

40 CFR Part 63 Subpart CC Requirements for Crude and Vacuum Units

The owner or operator shall comply with the provisions of 40 CFR Part 63 Subpart CC, as applicable, upon initial start-up. [40 CFR 63.640(1)(2)]

40 CFR Part 63 Subpart UUU Other Requirements for SRU2

The owner or operator shall continue complying with the applicable provisions of 40 CFR Part 63 Subpart UUU. [40 CFR 63.1563(b)]

Other Requirements

No later than the startup of the Crude Expansion Project, the compressor internal combustion engine J-2003E shall be equipped with Non-Selective Catalytic Reduction (NSCR) that is designed to control at least 25% of the NO_x emissions from the compressor.

Reporting

The owner or operator shall submit initial and subsequent semiannual reports to the Kansas Department of Health and Environment (KDHE) in accordance with the applicable rule provisions listed above and in the following:

1. 40 CFR Part 60 Subpart A General Provisions
2. 40 CFR Part 61 Subpart A General Provisions.
3. 40 CFR Part 63 Subpart A General Provisions.

Performance Testing

Performance testing is required as listed below for emissions units subject to 40 CFR Part 60 per K.A.R. 28-19-720 [40 CFR 60.8(a)]. Certain emissions units are also subject to performance testing to demonstrate compliance with BACT limits per KAR 28-19-350. Performance testing shall be conducted within 60 days after achieving the maximum production rate at which the subject equipment will be operated but no later than 180 days after initial startup.

BACT, 40 CFR Part 60 Subpart J and 40 CFR Part 63 Subpart UUU Performance Testing Requirements for New Heaters, and SRU2

1. The owner or operator shall perform testing on Heaters B-307 and B-306 to demonstrate compliance with the NO_x emission limit of 0.035 lb/mmBtu.
2. The owner or operator shall perform testing on Heater B-2402 to demonstrate compliance with the NO_x emission limit of 0.030 lb/mmBtu.
3. The owner or operator shall perform testing on Heaters B-307, B-306 and B-2402 to demonstrate compliance with the CO emission limit of 50 ppm by volume (dry, 3% O₂).
4. The fuel gas system for Heaters B-307, B-306 and B-2402 has been tested to demonstrate compliance with 40 CFR Part 60 Subpart J. The owner or operator is not required to perform additional testing to demonstrate compliance with 40 CFR Part 60 Subpart J.
5. Performance test is not required for the SRU Incinerator's stack since the SRU2 is already subject to 40 CFR part 60 Subpart J. [Item 1 of Table 33 of Subpart UUU]

NSPS Subpart QOO Requirement for Crude Expansion Wastewater System:

Before using any equipment installed in compliance with the requirements of 40 CFR 60.692-2, 60.692-3, 60.692-4, 60.692-5, or 60.693, the owner or operator shall inspect such equipment for indications of potential emissions, defects, or other problems that may cause the requirements of this subpart not to be met. Points of inspection shall include, but are not limited to, seals, flanges, joints, gaskets, hatches, caps, and plugs. [40 CFR 60.696(a)]

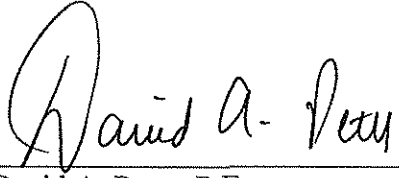
Notification

1. K.A.R. 28-19-720 (40 CFR 60.7) requires that the owner or operator shall comply with the applicable provisions of 40 CFR 60.7. The enclosed NSPS notification form can be used to submit the required NSPS notifications.
2. K.A.R. 28-19-750 (40 CFR 63.9) requires that the owner or operator shall comply with the applicable provisions of 40 CFR 63.9.
3. Notify the South Central District Office Air Program Field Staff in Wichita at (316)337-6042 when the project is completed so that an evaluation can be conducted.

General Provisions

1. This document shall become void if the construction or modification has not commenced within 18 months of the effective date, or if the construction or modification is interrupted for a period of 18 months or longer.
2. A construction permit or approval must be issued by KDHE prior to commencing any construction or modification of equipment or processes which results in a potential-to-emit increase equal to or greater than the thresholds specified at K.A.R. 28-19-300.
3. Upon presentation of credentials and other documents as may be required by law, representatives of the KDHE (including authorized contractors of the KDHE) shall be allowed by the permittee to:
 - (a) enter upon the premises where a regulated facility or activity is located or conducted or where records must be kept under conditions of this document;
 - (b) have access to and copies of, at reasonable times, any records that must be kept under conditions this document;
 - (c) inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this document; and
 - (d) sample or monitor, at reasonable times, for the purposes of assuring compliance with this document or as otherwise authorized by the Secretary of the KDHE, any substances or parameters at any location.
4. The emission unit or stationary source that is the subject of this document shall be operated in compliance with all applicable requirements of the Kansas Air Quality Act and the federal Clean Air Act.
5. This document is subject to periodic review and amending as deemed necessary to fulfill the intent and purpose of the Kansas Air Quality Statutes and Regulations.
6. This document does not relieve the permittee of the obligation to obtain other approvals, permits, licenses, or documents of sanction which may be required by other federal, state, or local agencies.
7. Issuance of this document does not relieve the owner or operator of any requirement to obtain an air quality operating permit under any applicable provision of K.A.R. 28-19-500.

Approval Engineer



David A. Peter, P.E.
Environmental Engineer
Air Permitting Section

10-12-09

Date Signed

DAP:saw
C-8348





Mark Parkinson, Governor
Roderick L. Bremby, Secretary

DEPARTMENT OF HEALTH
AND ENVIRONMENT

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Division of Environment

October 12, 2009

Source ID No. 0150004

Patricia Scott
U.S. EPA, Region 7
AWMD/APCO
901 N. 5th Street
Kansas City, KS 66101

REC'D

OCT 14 2009

APCO

SUBJECT: PSD Permit Modification for the Crude Expansion Project

Dear Ms. Scott:

Enclosed is the Response to Comments regarding the PSD Permit Modification for the Crude Expansion Project for Frontier El Dorado Refining Company located in El Dorado, Kansas. Also enclosed is a copy of the final permit.

If you have any questions, please contact me at (785) 296-1104.

Sincerely,

David A. Peter
Professional Environmental Engineer
Air Permitting Section

DAP:saw
Enclosures
C-8348

DIVISION OF ENVIRONMENT
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Air Permitting Section

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RESPONSE TO COMMENTS

regarding the

PSD PERMIT MODIFICATION FOR THE CRUDE EXPANSION PROJECT

for

Frontier El Dorado Refining Company

The draft PSD Permit Modification for Frontier El Dorado Company (FEDRC) (Source ID No. 0150004) was placed on public notice by the Secretary of Health and Environment on September 3, 2009. The public comment period ended on October 5, 2009. Written comments were received by the Kansas Department of Health and Environment (KDHE) from the United States Environmental Protection Agency (US EPA) during the comment period.

Below are EPA-Region VII's comments and KDHE's responses.

Comment 1.

We suggest that the NO_x BACT limit for the larger vacuum heater, B-2402, be set at 0.030 lbs/MMBtu because the stack test data shows that the emissions consistently measured 0.025 lb/MMBtu during the test.

Response:

KDHE concurs with the comment and the permit has been modified to reflect EPA's comment.