

217/782-2113

CONSTRUCTION PERMIT - NESHAP SOURCE - NSPS SOURCE

PERMITTEE

CITGO Petroleum Corporation
Attn: Matt Klickman
135th Street and New Avenue
Lemont, Illinois 60439-3659

Application No.: 04120043 I.D. No.: 197090AAI
Applicant's Designation: Date Received: December 17, 2004
Subject: Catalytic Reformer Optimization Project
Date Issued: TO BE DETERMINED
Location: 135th Street and New Avenue, Lemont

Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of the catalytic reformer optimization project, that is, modifications made to heaters to restore original capacity as described in the above referenced application. This Permit is subject to standard conditions attached hereto and the following special conditions:

1.0 UNIT SPECIFIC CONDITIONS FOR SPECIFIC EMISSION UNITS

1.1 Unit: Catalytic Reformer Optimization Project

1.1.1 Description

The Unit 114 burners (Burners 114B-1, 114B-2 and 114B-3) will be replaced with burners of the same size resulting in restored capacity.

The Unit 116 burners (Burners 116B-1, 116B-2, 116B-3, and 116B-4) will be replaced with burners of the same size resulting in restored capacity. The replacement burners on 116B-1 and 116B-2 will be ultra-low NO_x.

Because Unit 114 and 116 will have restored capacity, the capacities to process naphtha will increase in U114 and U116. The net increase in capacity will be offset by the shutdown of U123. Therefore, this permit does not authorize a net increase of hydrotreater capacity.

1.1.2 List of Emission Units and Air Pollution Control Equipment

Emission Unit	Description	Date Constructed/ Modified	Emission Control Equipment
114B-1	Process Heater - Replace burner (same size)	2005	None

Emission Unit	Description	Date Constructed/ Modified	Emission Control Equipment
114B-2	Process Heater - Replace burner (same size)	2005	None
114B-3	Process Heater - Replace burner (same size)	2005	None
116B-1	Process Heater - Replace burner with ultra low NO _x (same size)	2005	Ultra Low NO _x
116B-2	Process Heater - Replace burner with ultra low NO _x (same size)	2005	Ultra Low NO _x
116B-3	Process Heater - Replace burner (same size)	2005	None
116B-4	Process Heater - Replace burner (same size)	2005	None
Components	New Fugitive Components	2005	None

1.1.3 Applicable Provisions and Regulations

- a. The "affected component" for the purpose of these unit-specific conditions, is a new component installed as part of the Catalytic Reformer Optimization Project described in Conditions 1.1.1 and 1.1.2.
 - i. This permit is issued based upon the affected components being subject to National Emission Standards for Hazardous Air Pollutants From Petroleum Refineries, 40 CFR 63, Subparts A and CC. The Illinois EPA administers the NESHAP for subject sources in Illinois pursuant to a delegation agreement with the USEPA. The Permittee shall comply with all applicable requirements of 40 CFR 63, Subparts A and CC.

Note: The Permittee has indicated that it generally has chosen to comply with the equipment leak requirements specified in 40 CFR 63, Subpart CC by complying with the Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry 40 CFR 60, Subpart VV. This is one of the options for compliance set forth by 40 CFR 63, Subpart CC.

- ii. This permit is issued based on the affected components associated with the catalytic reformer optimization project being subject to 35 IAC Part 218 Subpart R: Petroleum Refining and Related Industries; Asphalt Materials.

Note: When the requirements for equipment leaks under 40 CFR Part 63 Subpart CC are more stringent than the LDAR requirements in 35 IAC 219.445-452, compliance with 40 CFR Part 63 Subpart CC shall be deemed compliance with 35 IAC 219.445-452.

- iii. This permit is issued based upon certain individual drain systems (IDS) associated with the Catalytic Reformer Optimization Project being subject to the NSPS for Standards of Performance for VOC Emissions From Petroleum Refinery Wastewater Systems, 40 CFR 60 Subparts A and QQQ. The Illinois EPA administers the NSPS for subject sources in Illinois pursuant to a delegation agreement with the USEPA. The Permittee shall comply with all applicable requirements of 40 CFR 60, Subparts A and QQQ.
- b. An "affected heater" for the purpose of these unit-specific conditions, is heater as described in Conditions 1.1.1 and 1.1.2.
 - i. A. The Permittee shall not cause or allow the emission of smoke or other particulate matter, with an opacity greater than 30 percent, into the atmosphere from the affected heaters except as provided below [35 IAC 212.123(a)].
 - B. The emission of smoke or other particulate matter from the affected heaters may have an opacity greater than 30 percent but not greater than 60 percent for a period or periods aggregating 8 minutes in any 60 minute period provided that such opaque emissions permitted during any 60 minute period shall occur from only one such emission unit located within a 305 m (1000 ft) radius from the center point of any other such emission unit owned or operated by such person, and provided further that such opaque emissions permitted from each such emission unit shall be limited to 3 times in any 24 hour period [35 IAC 212.123(b)].
 - ii. The Permittee shall not cause or allow the emission of carbon monoxide (CO) into the atmosphere from each affected process heater to exceed 200 ppm, corrected to 50 percent excess air [35 IAC 216.121].

iii. This permit is issued based upon the affected heaters being subject to National Emission Standards for Hazardous Air Pollutants From Industrial, Commercial, and Institutional Boilers and Process Heaters, 40 CFR 63, Subparts A and DDDDD. The Illinois EPA administers the NESHAP for subject sources in Illinois pursuant to a delegation agreement with the USEPA. The Permittee shall comply with all applicable requirements of 40 CFR 63, Subparts A and DDDDD.

Note: Pursuant to 40 CFR 63.7506(b), the affected heaters are subject to only the initial notification requirements in 40 CFR 63.9(b).

1.1.4 Non-Applicability of Regulations of Concern

- a. This permit is issued based on the affected heaters not being subject to the New Source Performance Standards (NSPS) for Small Industrial-Commercial-Institutional Steam Generating Units, 40 CFR Part 60, Subpart Dc, because the affected heaters are process heaters.
- b. The Permittee has addressed the applicability of 40 CFR 52.21, Prevention of Significant Deterioration (PSD) and 35 IAC Part 203, Major Stationary Sources Construction and Modification (MSSCAM) to this project. The limits in this permit are intended to ensure that the project addressed in this construction permit does not constitute a major modification pursuant to these rules, as further explained in Attachments 1 through 3.
 - i. This permit is issued based upon an increase of 0.84 tons of VOM per year attributable to the new affected components.
 - ii. This permit is issued based upon increases in emissions from equipment attributable to additional firing of heaters 114B-1, 2, 3 and 116B-1, 2, 3, and 4 as follows. Note: actual emissions (NAA NSR pollutants) and baseline actual emissions (PSD pollutants) are based on calendar years 2003 and 2004:

<u>Equipment</u>	<u>NO_x (T/Yr)</u>	<u>CO (T/Yr)</u>	<u>SO₂ (T/Yr)</u>	<u>VOM (T/Yr)</u>	<u>PM/PM₁₀ (T/Yr)</u>
U114 Heaters	71.63	26.17	9.59	----	1.88
U116 Heaters	-----	<u>66.13</u>	<u>20.54</u>	<u>1.58</u>	<u>2.34</u>
Total:	71.63	93.30	30.13	1.58	4.22

- iii. Unit 123 and modified Units 114/116 may be operated simultaneously as needed to accommodate the transition of all processing to modified Units 114/116 and the orderly permanent shutdown of Unit 123. If Unit 123 is not permanently shutdown within 180 days of the initial startup of modified Units 114/116, the Permittee shall submit information to the Illinois EPA on a monthly basis until Unit 123 is permanently shutdown, which information documents the additional emissions, if any, from the extended transition period, and demonstrates that a significant emissions increase has not occurred as a result.
- iv. This permit is issued based a contemporaneous decrease of 1.34 tons VOM occurring when two frac tanks were removed from service following the installation of three Ethanol Tanks (see also Construction Permit No. 01040066).

1.1.5 Control Requirements and Work Practices

- a.
 - i. The affected heaters 116B-1 and 116B-2 shall be equipped, operated, and maintained with Ultra-low NO_x burners. These burners shall be operated and maintained in conformance with good air pollution control practices.
 - ii. Only gaseous fuels shall be burned in the affected heaters.
- b. The affected components are subject to 35 IAC 218.445: Leaks-General Requirements, which provides that the owner or operator of a petroleum refinery shall:
 - i. Develop a monitoring program plan consistent with the provisions of 35 IAC 218.446;
 - ii. Conduct a monitoring program consistent with the provisions of 35 IAC 218.447;
 - iii. Record all leaking components which have a volatile organic material concentration exceeding 10,000 ppm consistent with the provisions of 35 IAC 218.448;
 - iv. Identify each component consistent with the monitoring program plan submitted pursuant to 35 IAC 218.446;
 - v. Repair and retest the leaking components as soon as possible within 22 days after the leak is found, but

no later than June 1 for the purposes of 35 IAC 218.447(a)(1), unless the leaking components cannot be repaired until the unit is shut down for turnaround; and

- vi. Report to the Agency consistent with the provisions of 35 IAC 218.449.

1.1.6 Production and Emission Limitations

- a. Operation of the following emission units shall not exceed the following limits:

<u>Emission Unit</u>	<u>Maximum Firing Rate* (mmBtu/Hr, HHV)</u>
114B-1	40.9
114B-2	24.6
114B-3	32.7
116B-1	98.8
116B-2	92.7
116B-3	24.6
116B-4	30.0

* Daily Average

- b. Monthly emissions shall not exceed the following limits:

<u>Emission Unit</u>	<u>NO_x (Ton)</u>	<u>CO (Ton)</u>	<u>SO₂ (Ton)</u>	<u>VOM (Ton)</u>	<u>PM/PM₁₀ (Ton)</u>
114B-1	3.6	1.2	0.5	0.1	0.2
114B-2	2.2	0.7	0.3	0.1	0.1
114B-3	2.9	0.9	0.4	0.1	0.2
116B-1	1.8	2.7	1.2	0.1	0.4
116B-2	1.7	2.6	1.1	0.1	0.3
116B-3	2.2	0.7	0.3	0.1	0.1
116B-4	2.7	0.9	0.4	0.1	0.1

- c. Annual emissions shall not exceed the following limits. Compliance with annual limits shall be determined on a monthly basis from the sum of the data for the current month plus the preceding 11 months (running 12 month total).

<u>Emission Unit</u>	<u>NO_x (Ton)</u>	<u>CO (Ton)</u>	<u>SO₂ (Ton)</u>	<u>VOM (Ton)</u>	<u>PM/PM₁₀ (Ton)</u>
114B-1	35.8	11.1	4.9	0.4	1.3
114B-2	21.5	6.7	2.9	0.2	0.8
114B-3	28.7	8.9	3.9	0.1	1.1

<u>Emission Unit</u>	<u>NO_x</u> <u>(Ton)</u>	<u>CO</u> <u>(Ton)</u>	<u>SO₂</u> <u>(Ton)</u>	<u>VOM</u> <u>(Ton)</u>	<u>PM/PM₁₀</u> <u>(Ton)</u>
116B-1	17.3	26.7	11.6	0.9	3.2
116B-2	16.2	25.1	10.9	0.8	3.0
116B-3	21.5	6.7	2.9	0.2	0.8
116B-4	26.3	8.2	3.6	0.3	1.0

1.1.7 Testing Requirements

a. Nitrogen Oxides Testing.

- i. Within 60 days after achieving the maximum production rate at which the affected heaters 116B-1 and 116B-2 will be operated, but not later than 180 days after initial startup, the NO_x emissions of the affected heaters 116B-1 and 116B-2 shall be measured during conditions which are representative of maximum emissions.
- ii. The following methods and procedures shall be used for testing of emissions, unless another method is approved by the Illinois EPA: Refer to 40 CFR 60, Appendix A, for USEPA test methods.

Location of Sample Points	USEPA Method 1
Gas Flow and Velocity	USEPA Method 2
Flue Gas Weight	USEPA Method 3
Moisture	USEPA Method 4
Nitrogen Oxides	USEPA Method 7

1.1.8 Monitoring Requirements

Monitoring requirements are not set for the Catalytic Reformer Optimization Project.

1.1.9 Recordkeeping Requirements

- a. The Permittee shall maintain records of the following items for the affected heaters and components to demonstrate compliance with Condition 1.1.6:
 - i. Firing rate of the affected heaters (mmBtu/hr on a daily average, based on higher heating value); and
 - ii. NO_x, CO, VOM, SO₂, PM and PM₁₀ emissions from the affected heaters (tons/month and tons/year), as determined by methods in Condition 1.1.12.
- b. The Permittee shall maintain records of the following items for the affected components:

- i. Number of new components by unit or location and type in the Catalytic Reformer Optimization Project; and
- ii. Calculated VOM emissions including supporting calculations, attributable to these components (tons/year), based on the methods in Condition 1.1.12.

1.1.10 Reporting Requirements

- a. The Permittee shall promptly notify the Illinois EPA, Air Compliance Unit, of deviations of the affected heaters and affected components with the permit requirements. Reports shall describe the probable cause of such deviations, and any corrective actions or preventive measures taken.

1.1.11 Operational Flexibility/Anticipated Operating Scenarios

- a. Operational flexibility is not set for the Catalytic Reformer Optimization Project.

1.1.12 Compliance Procedures

- a. Emission from affected components shall be based on the recordkeeping requirements in Condition 1.1.9 and applicable standard emission estimate methodology published by USEPA in "Protocol for Equipment Leak Emission Estimates", EPA-453/R-95-017 (November 1995).
- b. i. Compliance with the emission limits in Condition 1.1.6 for affected heaters 114B-1, 114B-2, and 114B-3 is addressed by the records required in Condition 1.1.9 and the emission factors and formulas listed below:

Emission factors for the affected heaters 114B-1, 114B-2 and 114B-3:

<u>Pollutant</u>	<u>Emission Factors</u> <u>(lbs/mmBtu)</u>
NO _x	0.2
CO	0.06
SO ₂	Mass Balance
VOM	0.002
PM/PM ₁₀	0.01

- ii. Compliance with the emission limits in Condition 1.1.6 for affected heaters 116B-1 and 116B-2 is addressed by the records required in Condition 1.1.9 and the emission factors and formulas listed below:

Emission factors for the affected heaters 116B-1 and 116B-2:

<u>Pollutant</u>	<u>Emission Factors</u> <u>(lbs/mmBtu)</u>
NO _x	0.04
CO	0.06
SO ₂	Mass Balance
VOM	0.002
PM/PM ₁₀	0.007

- iii. Compliance with the emission limits in Condition 1.1.6 for affected heaters 116B-3 and 116B-4 is addressed by the records required in Condition 1.1.9 and the emission factors and formulas listed below:

Emission factors for the affected heaters 116B-3 and 116B-4:

<u>Pollutant</u>	<u>Emission Factors</u> <u>(lbs/mmBtu)</u>
NO _x	0.2
CO	0.06
SO ₂	Mass Balance
VOM	0.002
PM/PM ₁₀	0.007

2. The new/modified emission units addressed by this construction permit may be operated under this permit until renewal of the CAAPP permit or a modification of the CAAPP permit is issued provided the Permittee submits a timely application to amend the current CAAPP permit to incorporate this project.

If you have any questions on this permit, please contact Jason Schnepf at 217/782-2113.

Donald E. Sutton, P.E.
Manager, Permit Section
Division of Air Pollution Control

DES:JMS:psj

cc: Region 1
Lotus Notes
CES

Attachment 1

Severe Ozone Nonattainment - VOM Netting Analysis (1-hour Standard)

Contemporaneous Time Period: 2001 Through 2005

Table I - Emissions Increases and Decreases Associated With The Proposed Modification

<u>Item of Equipment</u>	<u>Past Actual (Tons/Year)</u>	<u>Future Potential (Tons/Year)</u>	<u>Emission Change (Tons/Year)</u>
114B-1	1.2	0.4	-0.8
114B-2	1.0	0.2	-0.8
114B-3	1.1	0.3	-0.8
116B-1	0.24	0.9	0.66
116B-2	0.29	0.8	0.51
116B-3	0.06	0.2	0.14
116B-4	0.04	0.3	0.26
New Fugitive Components	0.00	0.84	0.84
U123B-1, 2, 3, 4, 5 Shutdown	0.6	0.0	-0.6
U123 Fugitives Shutdown	<u>0.96</u>	<u>0.0</u>	<u>-0.96</u>
Totals:	12.97	8.14	-1.55

Table II - Source-Wide Creditable Contemporaneous Emission Increases

<u>Item of Equipment</u>	<u>Commencement of Operation Date</u>	<u>Emissions Increase (Tons/Year)</u>	<u>Permit Number</u>
431B Replacement	November 2001	5.88	01070039
2002 Turnaround Project	November 2002	9.86	01070060
Three Ethanol Tanks	December 2002	3.39	01040066
Tier 2 Low Sulfur Gasoline	November 2003	6.04	01030085
			01070058
Desalter Solids Separation	August 2004	0.32	04050014
U335 Gas Additive Tank	November 2004	0.044	04100054
Lubricity Additive Tanks	November 2004	0.088	04110010
U125 distribution tray repl.	January 2005	<u>0.15</u>	04090068
	Total:	25.772	

Table III - Source-Wide Creditable Contemporaneous Emission Decreases

<u>Item of Equipment</u>	<u>Commencement of Operational Change Date</u>	<u>Emissions Decrease (Tons/Year)</u>	<u>Permit Number</u>
Boiler No. 19 Removed	February 2001	0.27	01070039
Frac Tank Removal	December 2001	<u>1.34</u>	04120043
	Total:	1.61	

Table IV - Net Emissions Change

	<u>(Tons/Year)</u>
Increases and Decreases Associated With Proposed Modification	-1.55
Creditable Contemporaneous Emission Increases	25.772
Creditable Contemporaneous Emission Decreases	<u>1.61</u>
	22.612

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Attachment 2

Moderate Ozone Nonattainment - NO_x Netting Analysis (8-hour Standard)

Contemporaneous Time Period: 12/17/1999 Through 4/2005

Table I - Emissions Increases and Decreases Associated With The Proposed Modification

<u>Item of Equipment</u>	<u>Past Actual (Tons/Year)</u>	<u>Future Potential (Tons/Year)</u>	<u>Emission Change (Tons/Year)</u>
114B-1	4.6	35.8	31.2
114B-2	4.2	21.5	17.3
114B-3	5.6	28.7	23.1
116B-1	42.2	17.3	-24.9
116B-2	35.1	16.2	-18.9
116B-3	6.4	21.5	15.1
116B-4	6.3	26.3	20.0
U123B-1, 2, 3, 4, 5 Shutdown	<u>92.3</u>	<u>0.00</u>	<u>-92.3</u>
Totals:	196.7	167.3	-29.4

Table II - Source-Wide Creditable Contemporaneous Emission Increases

<u>Item of Equipment</u>	<u>Commencement of Operation Date</u>	<u>Emissions Increase (Tons/Year)</u>	<u>Permit Number</u>
431B Replacement	November 2001	70.89	01070039
Tier 2 Low Sulfur Gasoline	November 2003	71.64	01030085
			01070058
U125 Distribution Tray Repl.	January 2005	<u>19.03</u>	04090068
	Total:	161.56	

Table III - Source-Wide Creditable Contemporaneous Emission Decreases

<u>Item of Equipment</u>	<u>Commencement of Operational Change Date</u>	<u>Emissions Decrease (Tons/Year)</u>	<u>Permit Number</u>
111B-2 - Ultra-Low NO _x Burners	March 2000	58.01	00010016
Boiler No. 19 Removed	February 2001	37.46	01070039
2002 Turnaround Project	November 2002	<u>361.81</u>	01070060
	Total:	457.28	

Table IV - Net Emissions Change

	<u>(Tons/Year)</u>
Increases and Decreases Associated With Proposed Modification	-29.4
Creditable Contemporaneous Emission Increases	161.56
Creditable Contemporaneous Emission Decreases	<u>457.28</u>
	-325.12

Attachment 3

Attainment Area - NO_x Netting Analysis

Contemporaneous Time Period: 3/2000 Through 4/2005

Table I - Emissions Increases and Decreases Associated With The Proposed Modification

<u>Item of Equipment</u>	<u>Past Actual (Tons/Year)</u>	<u>Future Potential (Tons/Year)</u>	<u>Emission Change (Tons/Year)</u>
114B-1	4.6	35.8	31.2
114B-2	4.2	21.5	17.3
114B-3	5.6	28.7	23.1
116B-1	42.2	17.3	-24.9
116B-2	35.1	16.2	-18.9
116B-3	6.4	21.5	15.1
116B-4	6.3	26.3	20.0
U123B-1, 2, 3, 4, 5 Shutdown	<u>92.3</u>	<u>0.00</u>	<u>-92.3</u>
Totals:	196.7	167.3	-29.4

Table II - Source-Wide Creditable Contemporaneous Emission Increases

<u>Item of Equipment</u>	<u>Commencement of Operation Date</u>	<u>Emissions Increase (Tons/Year)</u>	<u>Permit Number</u>
431B Replacement	November 2001	70.89	01070039
Tier 2 Low Sulfur Gasoline	November 2003	71.64	01030085
			01070058
U125 Distribution Tray Repl.	January 2005	<u>19.03</u>	04090068
	Total:	161.56	

Table III - Source-Wide Creditable Contemporaneous Emission Decreases

<u>Item of Equipment</u>	<u>Commencement of Operational Change Date</u>	<u>Emissions Decrease (Tons/Year)</u>	<u>Permit Number</u>
Boiler No. 19 Removed	February 2001	37.46	01070039
2002 Turnaround Project	November 2002	<u>361.81</u>	01070060
	Total:	399.27	

Table IV - Net Emissions Change

	<u>(Tons/Year)</u>
Increases and Decreases Associated With Proposed Modification	-29.4
Creditable Contemporaneous Emission Increases	161.56
Creditable Contemporaneous Emission Decreases	<u>399.27</u>
	-267.11

PROJECT SUMMARY

I. Introduction

A construction permit application has been submitted by CITGO for a Catalytic Reformer Optimization Project. As part of this project, the Unit 114 Hydrotreater burners (Burners 114B-1, 114B-2 and 114B-3) will be replaced with burners of the same size resulting in restored capacity. The Unit 116 No. 2 Catalytic burners (Burners 116B-1, 116B-2, 116B-3, and 116B-4) will be replaced with burners of the same size resulting in restored capacity. The replacement burners on 116B-1 and 116B-2 will be ultra-low NO_x. The conditions in the proposed permit for the project are based on the project not being a major modification under 35 IAC Part 203, Major Stationary Sources Construction and Modification (MSSCAM) and 40 CFR 52.21, Prevention of Significant Deterioration (PSD). The proposed permit conditions include emission limitations, monitoring requirements, recordkeeping requirements, reporting requirements and testing requirements.

II. Source Description

CITGO operates a petroleum refinery located in Lemont, Illinois, Will County. Will County is designated as attainment for all pollutants except ozone, which is designated as severe nonattainment for the one hour ozone standard and moderate non attainment for the eight hour ozone standard.

Unit 114 and 116 will have restored capacity as a result of this project, thus the capacities to process naphtha will increase in U114 and U116. The net increase in capacity will be offset by the shutdown of U123. Therefore, this permit does not authorize a net increase of hydrotreater capacity.

Emissions from this project will result from the combustion of fuel in process heaters and from fugitive leaks associated with new components.

III. Applicable Emission Standards

All emission sources in Illinois must comply with the Illinois Pollution Control Board's emission standards. The Board's emission standards represent the basic requirements for sources in Illinois. The Board has standards for sources of volatile organic material, nitrogen oxides, carbon monoxide, sulfur dioxide and particulate matter. This site readily complies with all applicable Board standards.

IV. Proposed Permit

The conditions of the permit would contain limitations and requirements that are intended to assure that this project will not trigger the requirements of MSSCAM and PSD. The permit conditions establish appropriate compliance procedures, including monitoring requirements, recordkeeping requirements, reporting requirements and testing requirements. The Permittee must carry out these procedures on an on-going basis to demonstrate that the refinery is operating within the limitations set by the permit.

V. Request for Comments

It is the Illinois EPA's preliminary determination that the facility meets all applicable state and federal air pollution control requirements, subject to the conditions proposed in the draft permit. The Illinois EPA is therefore proposing to issue a construction permit for this project. Comments are requested on this proposed action by the Illinois EPA and the proposed conditions on the draft permit.

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