

217/782-2113

CONSTRUCTION PERMIT

PERMITTEE

CITGO Petroleum Corporation
Attn: Claude Harmon
135th Street & New Avenue
Lemont, Illinois 60439

Application No.: 01070039

I.D. No.: 197090AAI

Applicant's Designation:

Date Received: July 13, 2001

Subject: Boiler (431B-Replacement)

Date Issued: October 1, 2001

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 a new boiler (431B-Replacement) with ultra-low NO_x burners as described in the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

1.0 Unit Specific Conditions

1.1 Unit: Boiler
Control: Ultra-Low NO_x Burners

1.1.1 Description

The new package boiler will replace the capacity of existing No. 19 Boiler. The boiler will be equipped with ultra-low NO_x burners.

1.1.2 List of Emission Units and Air Pollution Control Equipment

Emission Unit	Description	Emission Control Equipment
431B-Replacement	Boiler	Ultra-Low NO _x Burners

1.1.3 Applicability Provisions and Applicable Regulations

- a. An "affected boiler" for the purpose of these unit-specific conditions, is a boiler as described in Conditions 1.1.1 and 1.1.2.
- b.
 - i. The affected boiler is subject to the NSPS for Petroleum Refineries, 40 CFR 60 Subparts A and J. The Illinois EPA administers the NSPS for subject sources in Illinois pursuant to a delegation agreement with the USEPA.
 - ii. The Permittee shall not burn in the affected boiler any fuel gas that contains hydrogen sulfide (H₂S) in excess of 230 mg/dscm (0.10 gr/dscf) [40 CFR 60.104(a)(1)].

- c. i. The Permittee shall not cause or allow the emissions of smoke or other particulate matter, with an opacity greater than 30 percent, into the atmosphere from the affected boiler [35 IAC 212.123(a)].
- ii. The emission of smoke or other particulate matter from the affected boiler 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)].
- d. The Permittee shall not cause or allow the emission of carbon monoxide (CO) into the atmosphere from the affected boiler to exceed 200 ppm, corrected to 50 percent excess air [35 IAC 216.121].

1.1.4 Non-Applicability of Regulations of Concern

- a. This permit is issued based on the affected boiler not being subject to 40 CFR 60 Subpart Db, NSPS for Industrial-Commercial-Institutional Steam Generating Units because the affected boiler has a firing rate less than 250 mmBtu/hr.
- b. This permit is issued based on the affected boiler not being subject to 35 IAC 212.206, 212.207, or 214.162 because the affected boiler does not burn liquid fuel or a combination of fuels.
- c. This permit is issued based on the affected boiler not being subject to 35 IAC 214.301 because the affected boiler is not a process emission source, but rather a fuel combustion emission source.
- d. This permit is issued based on the affected boiler not being subject to 35 IAC 217.121 because the actual heat input of the affected boiler is less than 250 mmBtu/hr.

1.1.5 Operational and Production Limits and Work Practices

The rated firing rate of the affected boiler shall not exceed 249 mmBtu/hr.

1.1.6 Emission Limitations

- a. i. Emissions from the affected boiler shall not exceed the following limits:

<u>Pollutant</u>	<u>Emissions</u>	
	<u>(Ton/Mo)</u>	<u>(Tons/Year)</u>
NO _x	5.91	70.89
SO ₂	1.97	23.55
CO	7.49	89.82
VOM	0.49	5.88
PM	0.68	8.13
PM ₁₀	0.68	8.13

Emissions must be calculated using the compliance procedures specified in Condition 1.1.12.

- ii. Emissions from heater 113B-1 shall not exceed the following limits:

<u>Pollutant</u>	<u>Emissions</u>	
	<u>(Tons/Mo)</u>	<u>(Tons/Year)</u>
NO _x	1.69	20.23
SO ₂	0.72	8.60
CO	2.67	32.03
VOM	0.18	2.10
PM	0.25	2.90
PM ₁₀	0.25	2.90

The NO_x annual limit of 20.23 tons represents a 27.71 ton decrease (Actual emissions from 1996 and 1997 = 47.94; 47.94 - 20.23 = 27.71).

- iii. Emissions from heater 111B-2 shall not exceed the following limits:

<u>Pollutant</u>	<u>Emissions</u>	
	<u>(Tons/Mo)</u>	<u>(Tons/Year)</u>
NO _x	4.18	50.10
SO ₂	1.78	21.30
CO	0.02	0.20
VOM	0.01	0.06
PM	0.60	7.17
PM ₁₀	0.60	7.17

The NO_x annual limit of 50.10 tons represents a 58.01 ton decrease (Actual emissions from 1998 and 1999 = 108.11; 108.11 - 50.10 = 58.01).

- b. 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).
- c. The source has addressed the applicability and compliance of 40 CFR 52.21, Prevention of Significant Deterioration (PSD). These limits continue to ensure that the construction and/or modification addressed in this construction permit do not constitute a new major source or major modification pursuant to these rules.

1.1.7 Testing Requirements

a. Hydrogen Sulfide Testing.

In accordance with 40 CFR 60.8, within 60 days after achieving the maximum production rate at which the affected process heaters will be operated, but not later than 180 days after initial startup of the affected process heaters and at such other times as may be required by the Illinois EPA, the Permittee shall conduct performance test(s) in accordance with 40 CFR 60.106(e) and furnish the Illinois EPA a written report of the results of such performance test(s).

b. Nitrogen Oxides Testing

- i. Within 60 days after achieving the maximum production rate at which the will be operated, but not later than 180 days after initial startup, the nitrogen oxide (NO_x) emissions of the affected process heaters 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, and 40 CFR 61, Appendix B, 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

The Permittee must comply with the Monitoring requirements specified in 40 CFR 60.105 for fuel gas combustion devices. The Permittee shall install, calibrate, maintain and operate one of the following continuous monitoring systems:

- a. An instrument for continuously monitoring and recording the concentration by volume (dry basis, zero percent excess air) of SO₂ emissions into the atmosphere. The monitor shall include an oxygen monitor for correcting the data for excess air; or
- b. An instrument for continuously monitoring and recording the concentration (dry basis) of H₂S in fuel gases before being burned in any fuel gas combustion device.

1.1.9 Recordkeeping Requirements

The Permittee shall maintain records of the following items for the affected boiler to demonstrate compliance with Conditions 1.1.3 and 1.1.6:

- a. i. For an SO₂ monitor: a record of the concentration by volume (dry basis, zero percent excess air) of SO₂ emissions into the atmosphere; or
- ii. For a H₂S monitor: a record of the concentration (dry basis) of H₂S in fuel gases before being burned in the affected boiler.
- b. Rated firing rate of the affected boiler; and
- c. NO_x, CO, VOM, SO₂, PM and PM₁₀ emissions from the affected boiler (tons/month and tons/year).

1.1.10 Reporting Requirements

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

- b. The Permittee shall comply with the reporting requirements specified in 40 CFR 60.107(d), (e) and (f) and 40 CFR 60.105(e)(3).
- c. Two (2) copies of required reports and notifications concerning equipment operation or repairs, performance testing or a continuous monitoring system shall be sent to:

Illinois Environmental Protection Agency
Division of Air Pollution Control
Compliance Section (#40)
P.O. Box 19276
Springfield, Illinois 62794-9276

and one (1) copy shall be sent to the Illinois EPA's regional office at the following address unless otherwise indicated:

Illinois Environmental Protection Agency
Division of Air Pollution Control
9511 West Harrison
Des Plaines, Illinois 60016

1.1.11 Operational Flexibility/Anticipated Operating Scenarios

N/A

1.1.12 Compliance Procedures

- a. The Permittee shall determine compliance with the H₂S standard in 40 CFR 60.104(a)(1) as follows: Method 11, 15, 15A, or 16 shall be used to determine the H₂S concentration. The gases entering the sampling train should be at about atmospheric pressure. If the pressure in the refinery fuel gas lines is relatively high, a flow control valve may be used to reduce the pressure. If the line pressure is high enough to operate the sampling train without a vacuum pump, the pump may be eliminated from the sampling train. The sample shall be drawn from a point near the centroid of the fuel gas line [40 CFR 60.106(e)(1)].
- b. i. Compliance with the emission limits in Condition 1.1.6(a)(i) for the affected boiler shall be based on the recordkeeping requirements in Condition 1.1.9 and the emission factors and formulas listed below:

<u>Pollutant</u>	<u>Emission Factor (Lbs/mmBtu)</u>
NO _x	0.065
SO ₂	Mass Balance
CO	0.082353
VOM	0.005392
PM	0.007451
PM ₁₀	0.007451

- ii. Compliance with the emission limits in Condition 1.1.6(a)(ii) for heater 113B-1 shall be based on the emission factors and formulas listed below:

<u>Pollutant</u>	<u>Emission Factor (Lbs/mmBtu)</u>
NO _x	0.052
SO ₂	0.02212
CO	0.0824
VOM	0.0054
PM	0.0075
PM ₁₀	0.0075

- iii. Compliance with the emission limits in Condition 1.1.6(a)(iii) for process heater 111B-2 shall be based on the emission factors and formulas listed below:

<u>Pollutant</u>	<u>Emission Factor (Lbs/mmBtu)</u>
NO _x	0.052
SO ₂	0.02212
CO	0.0002
VOM	0.0001
PM	0.007451
PM ₁₀	0.007451

- c. Compliance with Condition 1.1.3(d) is considered to be demonstrated by the inherent nature of the operations at this source, as demonstrated by historical operation.

2. Operation of the affected boiler is allowed for 270 days under this construction permit.

Please note that the Permittee should seek to amend their CAAPP permit to include the construction and/or modification covered under this permit through the administrative amendment process by submitting an application that includes the information contained in form 273-CAAPP. This application

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must also identify and address any changes from the associated construction permit application. Note that information previously submitted in the construction permit application may be incorporated by reference into the application to amend the CAAPP permit. The Permittee must also provide updated information on fees as contained in form 292-CAAPP, "Fee Determination for CAAPP Permit."

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:jar

cc: Region 1

Attachment 1

PSD Applicability - NO_x Netting Analysis

Contemporaneous Time Period of November 1996 Through November 2001

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

<u>Item of Equipment</u>	<u>Past Actual (Tons/Yr)</u>	<u>Future Potential (Tons/Yr)</u>	<u>Emissions Change (Tons/Year)</u>	<u>Permit Number</u>
Replacement Boiler (431B)	0.00	70.89	70.89	01070039
Boiler No. 19	37.46	0.00	- 37.46	01070039
		Total	33.43	

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>
Vapor Recovery Unit w/Vapor Combustor	May 1998	14.80	98030075

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>
Installed Ultra-Low NO _x Burners (113B-1)	April 1998	27.71	98020008
Installed Ultra-Low NO _x Burners (111B-2)	February 2000	58.01	00010016
	Total:	85.72	

Table IV - Net Emissions Change

	<u>(Tons/Year)</u>
Increases and Decreases Associated With The Proposed Modification	33.43
Creditable Contemporaneous Emission Increases	14.80
Creditable Contemporaneous Emission Decreases	- 85.72
	- 37.49

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