

217/782-2113

CONSTRUCTION PERMIT -- NESHAP SOURCE -- NSPS SOURCE

PERMITTEE

Linde Gas North America, LLC
Attn: Samantha Gordon
575 Mountain Avenue
Murray Hill, New Jersey 07974

Application No.: 07120053

I.D. No.: 197090ABF

Applicant's Designation:

Date Received: December 31, 2007

Subject: Lemont Hydrogen Plant II

Date Issued: TO BE DETERMINED

Location: 810 East 135th Street, Lemont

This Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of a hydrogen plant for an ultra low sulfur diesel project at the adjacent refinery, as described in the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

1.0 PLANT-WIDE CONDITIONS FOR THE HYDROGEN PLANT

1.1 Plant-Wide Applicable Provisions and Regulations

1.1.1 Emission units at this plant are subject to the following regulation of general applicability in addition to particular regulations as set forth in Section 2 (Unit-Specific Conditions for Specific Emission Units) of this permit.

- a. No person shall cause or allow the emission of fugitive particulate matter from any process, including any material handling or storage activity, that is visible by an observer looking generally overhead at a point beyond the property line of the source unless the wind speed is greater than 40.2 kilometers per hour (25 miles per hour), pursuant to 35 IAC 212.301 and 212.314.

1.2 Applicability of New Source Review Regulations

1.2.1. The Permittee, in conjunction with the owner and operator of the adjacent refinery, CITGO, 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). The limits established by this permit and the construction permit for the Ultra Low Sulfur Diesel project (ID No. 197090AAI, Permit No. 07090059) are intended to ensure that the new and modified units addressed in these construction permits do not constitute a major modification of the refinery pursuant to these rules (See also Attachments 1 and 2).

For this purpose, the new hydrogen plant is considered in conjunction with the Ultra Low Sulfur Diesel Project, for which the hydrogen plant is a necessary element, as the two are considered a single project for purposes of PSD and MSSCAM. The net emissions increases resulting from the addition of the hydrogen plant and other activities at the refinery are described in the attachments to this permit.

1.3 Plant-Wide Recordkeeping Requirements

1.3.1 Retention and Availability of Records

- a. All records and logs required by this permit shall be retained for at least five years from the date of entry (unless a longer retention period is specified by the particular recordkeeping provision herein), shall be kept at a location at the source that is readily accessible to the Illinois EPA or USEPA, and shall be made available for inspection and copying by the Illinois EPA or USEPA upon request.
- b. The Permittee shall retrieve and print, on paper during normal source office hours, any records retained in an electronic format (e.g., computer) in response to an Illinois EPA or USEPA request for records during the course of a source inspection.

1.4 Plant-Wide Reporting Requirements

1.4.1 Reporting and Notifications Associated with Emissions Tests

- a. The Illinois EPA shall be notified prior to required emissions tests to enable the Illinois EPA to observe these tests. Notification of the expected date of testing shall be submitted a minimum of 30 days prior to the expected date. Notification of the actual date and expected time of testing shall be submitted a minimum of 5 working days prior to the actual date of the test. The Illinois EPA may at its discretion accept notifications with shorter advance notice provided that the Illinois EPA will not accept such notifications if it interferes with the Illinois EPA's ability to observe testing.
- b. At least 60 days prior to the actual date of required emissions testing, a written test plan shall be submitted to the Illinois EPA for review. This plan shall describe the specific procedures for testing, including as a minimum:
 - i. The person(s) who will be performing sampling and analysis and their experience with similar tests.

- ii. The specific conditions under which testing will be performed, including a discussion of why these conditions will be representative of maximum emissions and the means by which the operating parameters for the emission unit and any control equipment will be determined.
 - iii. The specific determinations of emissions and operation, which are intended to be made, including sampling and monitoring locations.
 - iv. The test method(s) that will be used, with the specific analysis method, if the method can be used with different analysis methods.
 - v. Any minor changes in standard methodology proposed to accommodate the specific circumstances of testing, with justification.
- c. Copies of the Final Reports(s) for required emissions tests shall be submitted to the Illinois EPA within 30 days after the test results are compiled and finalized. The Final Report shall include as a minimum:
- i. A summary of results.
 - ii. General information.
 - iii. Description of test method(s), including description of sample points sampling train, analysis equipment, and test schedule.
 - iv. Detailed description of test conditions, including:
 - A. Process information.
 - B. Control equipment information, e.g., equipment condition and operating parameters during testing.
 - v. Data and calculations, including copies of all raw data sheets, opacity observation records and records of laboratory analyses, sample calculations, and data on equipment calibration.

1.4.2 Notification and Reporting of Deviations

- a. Except as specified in a particular provision of this permit or in a subsequent CAAPP Permit for the plant, notifications and reports for deviation from applicable emission standards and control requirements shall include

at least the following information: the date and time of the event, a description of the event, information on the magnitude of the deviation, a description of the corrective measures taken, and a description of any preventative measures taken to prevent future occurrences.

1.5 Plant-Wide Compliance Procedures

1.5.1 Hydrogen Plant Reformer

- a. Emissions from the combustion equipment shall be determined from appropriate emission factors for the affected equipment which shall be developed, in order of preference, from testing of the affected units, testing of other similar units, manufacturer's data, and emission factors published by USEPA.

1.5.2 Components

- a. Emissions from the components, i.e., leaks from valves, pumps, fittings, etc., shall be determined from standard emission estimate methodology published by USEPA, e.g., "Protocol for Equipment Leak Emission Estimates", EPA-453/R-95-017 (November 1995).

1.5.3 Process Vents

- a. Emissions from the process vents shall be determined from appropriate emission factors for the affected units, as developed from testing of the affected units and process design data.

1.5.4 Annual Limits

- a. Unless otherwise specified in an applicable provision, compliance with the annual limits shall be determined from a running total of 12 months of data.

- 1.6 The hydrogen plant addressed by this permit may be operated under this construction permit until a CAAPP permit is issued that addresses the plant.

2.0 UNIT SPECIFIC CONDITIONS FOR SPECIFIC EMISSION UNITS

2.1 Unit: Reformer Unit

2.1.1 Description

The hydrogen plant will be designed to produce a maximum of 45 million cubic feet per day of gaseous hydrogen by steam methane reforming. The hydrogen plant will use suitable feed gas supplied by the refinery and/or natural gas as its feedstock. The principle emission unit in the hydrogen plant is the furnace or heater that supplies the energy for this process. The heater will be fired by a combination of Pressure Swing Adsorption Purge Gas (a by-product process stream from the production of hydrogen that is suitable for use as a fuel), natural gas, and refinery fuel gas.

2.1.2 List of Emission Units and Air Pollution Control Equipment

Emission Unit	Description	Emission Control Equipment
Reformer Unit	Process Heater Rated at 365 mmBtu/hour	Ultra Low-NO _x Burner System

2.1.3 Applicable Provisions and Regulations

- a. An "affected heater" for the purpose of these unit-specific conditions, is the heater described in Conditions 2.1.1 and 2.1.2.
- b. i. The affected heater is subject to the New Source Performance Standard (NSPS) for Petroleum Refineries, 40 CFR 60 Subpart J, and requirements of the General Provisions of the NSPS, 40 CFR 60, Subpart A. 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 heater 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. The affected heater is subject to 35 IAC 212.122(a), which provides that no person shall cause or allow the emission of smoke or other particulate matter into the atmosphere from any fuel combustion emission unit for which construction or modification commenced on or after April 14, 1972, with actual heat input greater than 73.2 MW (250 mmBtu/hour), having an opacity greater than 20 percent [35 IAC 212.122(a)].

- d. The affected heater is subject to 35 IAC 216.121, which provides that no person shall not cause or allow the emission of carbon monoxide (CO) into the atmosphere from a fuel combustion emission unit with a capacity of 10 million Btu/hour or more to exceed 200 ppm, corrected to 50 percent excess air [35 IAC 216.121].

2.1.4 Non-Applicability of Regulations of Concern

- a. This permit is issued based on the affected heater not being subject to 40 CFR 60 Subpart Db, NSPS for Industrial-Commercial-Institutional Steam Generating Units because the affected heater is a process heater as defined in 40 CFR 60 Subpart Db.

- b.
 - i. This permit is issued based on the affected heater not being subject to emission standards or other requirements pursuant to the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial, and Institutional Boilers and Process Heaters, 40 CFR 63, Subpart DDDDD. This is because this NESHAP has been vacated by a court mandate, pursuant to a request by USEPA, and is no longer in effect.

Note: "Large gaseous fuel units," under this NESHAP would have been limited to CO emissions of no more than 400 ppm, dry basis at 3 percent oxygen, 30-day rolling average, excluding periods of startup, shutdown, malfunction, and low-load operation, which is less stringent than the standard set by 35 IAC 216.121 (See Condition 2.1.3(d)).

- ii. This permit is issued based on the affected heater not being a major source of HAPs for purposes of Section 112(g) of the Clean Air Act so that a case-by-case determination of Maximum Achievable Control Technology (MACT) is not required for the affected unit pursuant to Section 112(g). This is because the affected heater is being constructed at a developed site and the potential annual emissions of HAPs from the affected heater are less than 10 tons of any individual HAP and less than 25 tons of any combination of HAPs.
 - iii. The Permittee shall comply in a timely manner with all applicable provisions of a NESHAP adopted by USEPA or a case-by-case MACT determination made by the Illinois EPA that applies to the affected heater. For this purpose, the Permittee shall address the affected heater in an application submitted to the Illinois EPA pursuant to Section 112(j) of the Clean

Air Act to support a case-by-case determination of MACT for the heaters at the source.

2.1.5 Control Requirements and Work Practices

- a. The affected heater 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.
- b. PSA (Pressure Swing Adsorption) gas, refinery fuel gas, and natural gas, or a combination of such fuels shall be the only fuels fired in the affected heater.

2.1.6 Production and Emission Limitations

- a. i. The rated heat input capacity of the affected heater shall not exceed 365 mmBtu/hour.
- ii. The emissions of the affected heater shall not exceed the following short term emission limits:

Emissions (Lbs/mmBtu)				
NO _x	CO	SO ₂	VOM	PM/PM ₁₀
0.05	0.0096	0.00188	0.0050	0.0075

- iii. The emissions of the affected heater shall not exceed the following annual emission limits:

Emissions (Tons/Year)				
NO _x	CO	SO ₂	VOM	PM/PM ₁₀
80.0	15.3	3.0	8.0	12.0

2.1.7 Testing Requirements

- a. Testing of NO_x and CO Emissions
 - i. Within 60 days after achieving the maximum rate at which the affected heater will be operated, but not later than 180 days after initial startup, the NO_x and CO emissions of the affected heater 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 7e or 19
Carbon Monoxide	USEPA Method 10

b. Hydrogen Sulfide Testing

The Permittee shall comply with any applicable performance test requirements, if any, of the NSPS using the test methods and procedures of 40 CFR 60.106.

Note: The hydrogen sulfide testing requirement is not necessary if the H₂S content of the fuel gas to the affected heater is monitored by an existing CEM.

2.1.8 Monitoring Requirements

- a. i. The Permittee shall comply with the monitoring requirements specified in 40 CFR 60.105 by installing, calibrating, maintaining and operating an instrument for continuously monitoring and recording the concentration (dry basis) of H₂S in fuel gases before being burned in the affected heater.
- ii. Notwithstanding the above, the Permittee shall comply with monitoring requirements set by USEPA, pursuant to 40 CFR 60.13(i), following consideration of written application to USEPA by the Permittee.
- b. The Permittee shall maintain records of the concentration (dry basis) of H₂S in fuel gases before being burned in the affected heater to demonstrate compliance with the limit in Condition 2.1.3(b)(ii).

2.1.9 Recordkeeping Requirements

- a. The Permittee shall maintain a file or other records for the affected heater that contains the following information:
 - i. The maximum rated heat input of the affected heater with supporting documentation.
 - ii. Records of the Permittee's established operating and maintenance procedures for the affected heater.
- b. The Permittee shall maintain the following logs or other records for the affected heater:
 - i. Each startup of the affected heater, including the date and duration of each startup, and note any

deviations from normal startup procedures, as set forth in the Permittee's written operating procedure.

- ii. An operating log that, at a minimum, includes:
 - A. The information required by 40 CFR 60.7(b); and
 - B. Information on any malfunction or breakdown, including cause, duration and whether the affected boiler continued to operate during that time.
 - iii. A maintenance and repair log for the affected heater listing each activity performed with date.
- c. The Permittee shall keep the following records related to emissions:
- i. Any period of time, including startup, shutdown, or malfunction, when emissions exceed an applicable limit.
 - ii. The annual NO_x, CO, VOM, PM, PM₁₀, and SO₂ emissions from the affected heater, based on continuous emissions monitoring data, fuel consumption or applicable emission factors with supporting calculations.

2.1.10 Reporting Requirements

- a. The Permittee shall notify the Illinois EPA of deviations of the affected heater with the permit requirements. Reports shall describe the probable cause of such deviations, and any corrective actions or preventive measures taken and shall be submitted in conformance with the requirements, content and schedule contained in 40 CFR 60.7.

2.2 Unit: Components

2.2.1 Description

As part of the piping and pumping equipment associated with the hydrogen plant, leaks may occur from components such as valves, flanges and compressor seals emitting VOM and CO to the atmosphere. These emissions are controlled by a Leak Detection and Repair (LDAR) program.

2.2.2 List of Emission Units and Air Pollution Control Equipment

Emission Unit	Description	Emission Control Equipment
Components	Components (compressors, open-ended lines, valves, connectors) within the Hydrogen Plant*.	LDAR

* Excludes components at the refinery, which are not operated or maintained by the Permittee.

2.2.3 Applicable Provisions and Regulations

- a. An "affected component" for the purpose of these unit-specific conditions, is a component installed as part of the Hydrogen Plant Project as described in Conditions 2.2.1 and 2.2.2, and any subsequent replacement of such component.
- b. The affected components are subject to NESHAP for Petroleum Refineries, 40 CFR 63, Subpart CC and applicable requirements of the General Provisions of the NESHAP, 40 CFR 63, Subpart A. 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.
- c. The affected components are subject to the NSPS, 40 CFR 60, Subpart GGGa - Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries for Which Construction, Reconstruction, Or Modification Commenced after November 7, 2006, and requirements of the General Provisions of the NSPS, 40 CFR 60, Subpart A.

Note: Because the affected components are also subject to 40 CFR 63 Subpart CC, the Permittee is required to comply only with the provisions specified in Subpart CC (See also 40 CFR 63.640(p)).

- d. The affected components are 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 218.445-452, compliance with 40 CFR Part 63 Subpart CC shall be deemed compliance with 35 IAC 218.445-452.

2.2.4 Non-Applicability of Regulations of Concern

- a. For purposes of NSPS and NESHAP rules and pursuant to 40 CFR 63.640(p), components that would be also subject to the provisions of 40 CFR Parts 60 and 61 are required only to comply with the provisions of 40 CFR Part 63 Subpart CC, rather than 40 CFR Parts 60 and 61.
- b. The affected components are not subject to 40 CFR Part 60 Subpart VVa: Standards Of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry For Which Construction, Reconstruction, Or Modification Commenced after November 7, 2006, because the affected components are not located within process units that produce one or more of the chemicals listed in 40 CFR 60.489.

2.2.5 Control Requirements and Work Practices

- a. The affected components are subject to 40 CFR 63.648: Equipment Leak Standards. Pursuant to 40 CFR 63.648(a), the Permittee shall comply with the provisions of 40 CFR Part 60 Subpart VV and 40 CFR 63.648(b) except as provided in 40 CFR 63.648(a)(1), (a)(2), and (c) through (i). In particular, for purposes of compliance with 40 CFR 63.648, the provisions of 40 CFR Part 60, Subpart VV apply only to equipment in organic HAP service, as defined in 40 CFR 63.641.

2.2.6 Emission Limitations

- a. Emissions of VOM from the affected components shall not exceed 0.9 tons per calendar year.
- b. Emissions of CO from the affected components shall not exceed 0.06 tons per calendar year.

2.2.7 Leak Detection Methods and Procedures

- a. The Permittee shall comply with the applicable test methods and procedures of 40 CFR 60.485.

- b. The Permittee shall comply with the applicable monitoring program for leaks in 35 IAC 218.447.

2.2.8 Recordkeeping Requirements

- a. The Permittee shall comply with the applicable recordkeeping requirements in 40 CFR 60.486 and 40 CFR 63.654. In these records, the Permittee shall include such other information as is needed to assure that the leak detection and repair requirements in this permit are met.
- b. The Permittee shall maintain a file that contains the following information for affected components. This file may be kept in either paper or electronic copy:
 - i. The applicable identification number for each component;
 - ii. Results from initial leak monitoring of the affected component;
 - iii. Leak definition for each affected component; and
 - iv. Monitoring frequency (i.e., when monitoring is due).
- c. The Permittee shall maintain records of the following items for affected components:
 - i. Number of components by unit or location and type.
 - ii. Calculated VOM emissions including supporting calculations, attributable to these components (tons/year).

2.2.9 Reporting Requirements

- a. The Permittee shall notify the Illinois EPA of deviations of an affected component with the permit requirements. Reports shall describe the probable cause of such deviations, and any corrective actions or preventable measures taken. As the operation of affected components is addressed by reporting requirements under applicable rules, this report shall be submitted with the periodic reports required by such regulations.
- b. The Permittee shall comply with the applicable reporting provisions in 40 CFR 60.487 and 40 CFR 63.654.

2.3 Unit: Deaerator Unit

2.3.1 Description

In the Deaerator Unit, condensate (i.e., condensed steam from the various heat exchangers and separators that will be reused as feed water) is brought into contact with steam to strip out dissolved gases (e.g., methanol and carbon monoxide). The Deaerator Unit emits these gases through the Deaerator Unit vent.

2.3.2 List of Emission Units and Air Pollution Control Equipment

Emission Unit	Description	Emission Control Equipment
Deaerator Unit Vent	Deaerator Unit Vent	None

2.3.3 Applicable Provisions and Regulations

- a. An "affected deaerator vent" for the purpose of these unit-specific conditions, is the deaerator vent described in Conditions 2.3.1 and 2.3.2.
- b. The affected deaerator vent is subject to 35 IAC 218.441(c)(1), which provides that no person shall cause or allow the discharge of more than 8 lbs/hour of organic material (OM) into the atmosphere from process vents at a refinery.

2.3.4 Non-Applicability of Regulations of Concern

- a. The affected deaerator vent is not subject to NESHAP, 40 CFR 63, Subpart CC because deaerator vents are specifically excluded from the definition of miscellaneous process vent, pursuant to 40 CFR 63.641.

2.3.5 Control Requirements and Work Practices

- a. The affected deaerator vent shall be maintained and operated with good operating practices to minimize emissions.

2.3.6 Production and Emission Limitations

- a. Emissions from the deaerator vent shall not exceed the following limits:

Pollutant	Emissions	
	(Lbs/Hour)	(Tons/Year)
CO	1.01	4.41
VOM	1.86	8.11

2.3.7 Testing Requirements

Upon request by the Illinois EPA, the emissions of OM, VOM, and/or CO from the deaerator vent shall be tested in accordance with appropriate test methods.

2.3.8 Monitoring Requirements

Monitoring requirements are not set for the affected deaerator vent.

2.3.9 Recordkeeping Requirements

- a. The Permittee shall maintain a file or other records for the affected deaerator vent that contains the maximum emissions which could occur from the affected deaerator vent with supporting calculations and documentation.
- b. The Permittee shall keep the following records related to emissions from the affected deaerator vent:
 - i. Operating data for the vent, i.e., hours of operation or amount of condensate processed.
 - ii. The annual CO and VOM emissions, based on appropriate emission factors with supporting calculations.

2.3.10 Reporting Requirements

- a. The Permittee shall notify the Illinois EPA of deviations of an affected deaerator vent with the permit requirements with the quarterly compliance reports required by Condition 2.1.10 for the affected heater. Reports shall describe the probable cause of such deviations, and any corrective actions or preventive measures taken.

2.4 Unit: Other Vents

2.4.1 Description

During start-up and shutdown of the hydrogen plant, the product gas stream from the plant will not be of sufficient purity to be used at the refinery. A flare system would be used to burn off-specification gases that are produced during start-up and shutdown of the hydrogen plant and releases from safety relief valves during upsets at the plant.

2.4.2 List of Emission Units and Air Pollution Control Equipment

Emission Unit	Description	Emission Control Equipment
Other Vents	Startup and shutdown events and upsets associated with the Hydrogen Plant	Flare

2.4.3 Applicable Provisions and Regulations

- a. An "affected process vent" for the purpose of these unit-specific conditions, is an emission unit or mode of operation described in Conditions 2.4.1 and 2.4.2, and the associated flare system.
- b. The flare is subject to 35 IAC 214.301, which provides that, except as further provided by 35 IAC Part 214, no person shall cause or allow the emission of sulfur dioxide into the atmosphere from any process emission source to exceed 2000 ppm.
- c. The flare is subject to the NSPS for Petroleum Refineries, 40 CFR Part 60, Subpart J. The flare is considered a fuel gas combustion device pursuant to this NSPS.
 - i. Pursuant to the NSPS, 40 CFR 60.104(a)(1), no person shall burn in the flare any fuel gas that contains hydrogen sulfide (H₂S) in excess of 230 mg/dscm (0.10 gr/dscf), provided, however, that the combustion of process upset gases or fuel gas that is released to the flare as a result of relief valve leakage or other emergency malfunctions is exempt from this requirement.
- d. The flare is subject to General Control Device Requirements specified at 40 CFR 60.18, which provides:
 - i. Flares shall be designed for and operated with no visible emissions as determined by the methods specified in 40 CFR 60.18(f), except for periods not

to exceed a total of 5 minutes during any 2 consecutive hours [40 CFR 60.18(c)(1)].

- ii. Flares shall be operated with a flame present at all times, as determined by the methods specified in 40 CFR 60.18(f) [40 CFR 60.18(c)(2)].
- iii. Flares shall be operated to comply with either the heat content specifications in 40 CFR 60.18(c)(3)(ii) and the maximum tip velocity specifications in 40 CFR 60.18(c)(4), or the requirements in 40 CFR 60.18(c)(3)(i) [40 CFR 60.18(c)(3)].

Note: As the hydrogen-rich streams are sent to the flare, it is expected that the flare will be operated to comply with the requirements for maximum exit velocity in 40 CFR 60.18(c)(3)(i).

- iv. Air-assisted flares shall be designed and operated with an exit velocity less than the velocity, V_{max} , as determined by the method specified in 40 CFR 60.18(f)(6) [40 CFR 60.18(c)(5)].
- v. Flares shall be steam-assisted, air-assisted, or nonassisted [40 CFR 60.18(c)(6)].
- vi. Flares shall be operated at all times when emissions may be vented to it [40 CFR 60.18(e)].

2.4.4 Non-Applicability of Regulations of Concern

Non-applicability of regulations of concern are not set for the affected units.

2.4.5 Control Requirements and Work Practices

- a. The emissions of VOM from the affected process vents shall be controlled by a flare system.
- b. The flare shall comply with the General Control Device Requirements specified at 40 CFR 60.18, which provides:
 - i. Flares shall be designed for and operated with no visible emissions as determined by the methods specified in 40 CFR 60.18(f), except for periods not to exceed a total of 5 minutes during any 2 consecutive hours [40 CFR 60.18(c)(1)].
 - ii. Flares shall be operated with a flame present at all times, as determined by the methods specified in 40 CFR 60.18(f) [40 CFR 60.18(c)(2)].

- iii. Flares shall be operated to comply with either the heat content specifications in 40 CFR 60.18(c)(3)(ii) and the maximum tip velocity specifications in 40 CFR 60.18(c)(4), or the requirements in 40 CFR 60.18(c)(3)(i) [40 CFR 60.18(c)(3)].

Note: As the hydrogen-rich streams are sent to the flare, it is expected that the flare will be operated to comply with the requirements for maximum exit velocity in 40 CFR 60.18(c)(3)(i).

- iv. A. Steam-assisted and nonassisted flares shall be designed for and operated with an exit velocity, as determined by the methods specified in 40 CFR 60.18(f)(4), less than 18.3 m/sec (60 ft/sec), except as provided in 40 CFR 60.18(c)(4)(ii) and (iii) [40 CFR 60.18(c)(4)(i)].
- B. Steam-assisted and nonassisted flares designed for and operated with an exit velocity, as determined by the methods specified in 40 CFR 60.18(f)(4), equal to or greater than 18.3 m/sec (60 ft/sec) but less than 122 m/sec (400 ft/sec) are allowed if the net heating value of the gas being combusted is greater than 37.3 MJ/scm (1,000 Btu/scf) [40 CFR 60.18(c)(4)(ii)].
- C. Steam-assisted and nonassisted flares designed for and operated with an exit velocity, as determined by the methods specified in 40 CFR 60.18(f)(4), less than the velocity, V_{max} , as determined by the method specified in 40 CFR 60.18(f)(5), and less than 122 m/sec (400 ft/sec) are allowed [40 CFR 60.18(c)(4)(iii)].
- v. Air-assisted flares shall be designed and operated with an exit velocity less than the velocity, V_{max} , as determined by the method specified in 40 CFR 60.18(f)(6) [40 CFR 60.18(c)(5)].
- vi. Flares shall be steam-assisted, air-assisted, or nonassisted [40 CFR 60.18(c)(6)].
- vii. Flares shall be operated at all times when emissions may be vented to it [40 CFR 60.18(e)].

2.4.6 Production and Emission Limitations

- a. Emissions from the flare, including emissions of affected process vents during startup and shutdown of the hydrogen

plant, shall not exceed the following limits. Compliance with the annual limit shall be determined from a running total of 12 months of data.

Pollutant	Emissions
	(Tons/Year)
NO _x	0.20
CO	0.92
SO ₂	0.01
VOM	1.00
PM/PM ₁₀	0.03

2.4.7 Testing Requirements

- a. Testing requirements are not set for the affected process vents.
- b. For the flare, the Permittee shall comply with any applicable performance test requirements of the NSPS using the test methods and procedures of 40 CFR 60.106.

2.4.8 Monitoring Requirements

- a. i. The Permittee shall comply with the monitoring requirements specified in 40 CFR 60.105 for the flare by installing, calibrating, maintaining and operating either 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 from the affected units. 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 subject to 40 CFR 60.104(a)(1) before being burned in the affected units.

Note: Continuous monitoring is not required for exempt gas streams that result from relief valve leakage or other emergency malfunctions.

- ii. Notwithstanding the above, the Permittee may also comply with alternative monitoring procedures pursuant to 40 CFR 60.13(i), if after receipt and consideration of written application, the USEPA approves such procedures for the affected units.

- b. i. The Permittee shall continuously monitor the flare for the presence of a flare pilot flame using a thermocouple or any other equivalent device to detect the presence of a flame [40 CFR 60.18(f)(2)].
- ii. The Permittee shall monitor the flare to ensure that it is operated and maintained in conformance with its design [40 CFR 60.18(d)].

2.4.9 Recordkeeping Requirements

- a. The Permittee shall maintain records of the following items related to the pilot flame in the flare:
 - i. Date and duration of any time when the pilot flame monitoring equipment of the flare was not in operation, with explanation.
 - ii. Date and duration of any time when there was no pilot flame present at the flare, with explanation.
 - iii. The Permittee shall maintain records of the following items for each exceedance of the limits in Conditions 2.4.3, 2.4.5, or 2.4.6, which shall include:
 - A. Identification of the limit that may have been exceeded.
 - B. Duration of the possible exceedance.
 - C. An estimate of the amount of emissions in excess of the applicable standard.
 - D. A description of the cause of the possible exceedance.
 - E. When compliance was reestablished.
- b. The Permittee shall maintain records of the following items for the flare:
 - i. Amount of different types of gas streams burned (mmscf/month and mmscf/year, by type).
 - ii. Emissions of NO_x, CO, VOM, PM/PM₁₀, and SO₂ (tons/month and tons/year).

2.4.10 Reporting Requirements

- a. The Permittee shall promptly notify the Illinois EPA of deviations of the affected process vents with the permit

requirements. Reports shall include information specified in Condition 2.4.10(a)(i).

- i. Within 30 days of exceedance of the limits in Conditions 2.4.3 and 2.4.5, the notification shall include:
 - A. Identification of the limit that may have been exceeded.
 - B. Duration of the possible exceedance.
 - C. An estimate of the amount of emissions in excess of the applicable standard.
 - D. A description of the cause of the possible exceedance.
 - E. When compliance was reestablished.
- ii. Other deviations shall be reported in a quarterly compliance report.
- b. The Permittee shall comply with the applicable reporting requirements specified in 40 CFR 60.107(e) and (f) and 40 CFR 60.105(e)(3).

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

Edwin C. Bakowski, P.E.
Acting Manager, Permit Section
Division of Air Pollution Control

Date Signed: _____

ECB:JMS:psj

cc: Region 1
Lotus Notes
CES
Matt Klickman, CITGO - Lemont Refinery

Attachment 1: Project Emission Changes Summary (Tons/Year)

Operation	NO _x (MSSCAM)	NO _x (PSD)	CO	SO ₂	VOM	PM	PM ₁₀
ULSD Project (Refinery)							
590H-1	12.30	12.30	25.39	8.75	0.80	2.30	2.30
590H-2	10.40	10.40	21.35	7.36	0.70	1.90	1.90
115B-1	5.16	5.16	4.22	1.94	0.28	0.39	0.39
115B-2	6.45	6.45	5.98	2.12	0.39	0.51	0.51
Unit 119, Trains A & B	-20.57	-20.57	-621.29	0	-6.77	-1.21	-1.21
Unit 121, Trains C & D	12.18	12.18	57.59	146.57	6.23	0.71	0.71
South Plant Cooling Tower	----	----	----	----	1.90	-4.56	-2.72
Components	----	----	----	----	6.03	----	----
SUBTOTAL ¹ :	46.49	46.49	114.53	166.74	16.03	5.81	5.81
Hydrogen Plant							
Reformer	80.00	80.00	15.30	3.00	8.00	12.00	12.00
Components	----	----	0.06	----	0.90	----	----
Deaerator Unit Vent	----	----	4.41	----	8.10	----	----
Flare	0.20	0.20	0.92	----	1.00	12.00	12.00
SUBTOTAL:	80.20	80.20	20.70	3.00	18.00	12.00	12.00
TOTAL:	126.69	126.69	135.23	169.74	34.33	17.60	17.81
Significance Threshold:	40	40	100	40	40	25	15
Greater Than Significant?	Yes	Yes	Yes	No	No	No	Yes

¹ Subtotal includes only units with emission increases. Emissions decreases are not included in this Attachment 1 but are included in Attachment 2, which provides the netting analysis for emissions of NO_x, CO, VOM, and PM₁₀.

Attachment 2: Netting Analysis (Tons/Year)

	Date	NO _x (MSSCAM)	NO _x (PSD)	CO	SO ₂	PM ₁₀
Project Emissions ¹		106.12	106.12	-486.06	169.74	12.04
Contemporaneous ² Increases						
Low Sulfur Gas. (01030085) ³	11/2003	71.64	71.64	90.69	---	8.17
Coker Deheading (05020061)	3/2006	13.20	13.20	19.29	17.44	2.33
U125 Mod. (04090068)	8/2007	22.90	22.90	17.07	20.27	1.55
Package Boilers (06080027)	9/2006	34.62	34.62	51.94	0.20	2.58
2002 Turnaround (01070060)	11/2002	----	----	----	----	----
Contemporaneous ² Decreases						
2002 Turnaround (01070060)	11/2002	-379.86	----	----	----	----
Aux Boiler LNB (05050037)	5/2006	-300.00 ⁴	-300.00 ⁴	0 ⁵	-300.00 ⁴	-20.00 ⁴
U119 TGU (07030063)	12/2008					
FCCU Controls (05070033)	11/2007					
Low Sulfur Gas. (01030085) ³	11/2003	----	----	----	-365.48	----
NET EMISSIONS CHANGE		-431.38	-51.52	-307.07	-457.83	6.67
Significance Threshold:		40	40	100	40	15
Greater Than Significant?		No	No	No	No	No

Notes:

- ¹ Includes emissions decreases associated with the project.
- ² The contemporaneous time period for PSD pollutants is March 2003 through March 2010. The contemporaneous time period for MSSCAM pollutants is September 2002 through March 2010.
- ³ Includes the Hydrogen Plant for the Low Sulfur Gasoline Project at the refinery (Construction Permit 01070058).
- ⁴ Emission decreases are enforceable pursuant to the Consent Decree between CITGO, USEPA, Illinois and others (Civil Action Number H-04-3883, entered January 26, 2005 in the Southern District of Texas). Up to 300 tons of NO_x emission reductions, up to 300 tons of SO₂ emission reductions, and up to 20 tons of PM emission reductions required by the Consent Decree are available for netting pursuant to Paragraph 137 of the Consent Decree.
- ⁵ Use of CO emission reductions generated by the Consent Decree for netting is not allowed, pursuant to Paragraph 136 of the Consent Decree.

JMS:psj

