217/782-2113

CONSTRUCTION PERMIT - REVISED
NSPS SOURCE

PERMITTEE

Linde Gas North America, LLC
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Application No.: 07120053 I.D. No.: 197090ABF
Applicant's Designation: Date Received: April 17, 2009
Subject: Lemont Hydrogen Plant II
Date Issued: December 29, 2009
Location: 810 East 135th Street, Romeoville

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 Federal Regulations

1.2.1. Applicability of New Source Review Regulations

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.

1.2.2 Source-Specific Approvals

As an alternative to requirements of the federal New Source Performance Standards (NSPS) for testing or monitoring that are included in this permit, the Permittee may comply with source-specific provisions for testing or monitoring approved by USEPA pursuant to 40 CFR 60.8(b) or 60.13(i).

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 Reformer

a. For emissions of pollutants from combustion equipment for which continuous emissions monitoring is performed, emissions shall be determined from the continuous emissions monitor.

b. For emissions of pollutants from combustion equipment for which continuous emission monitoring is not performed, emissions 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 Authorization to operate the hydrogen plant addressed by this permit may be operated under this construction permit until a CAAPP permit is issued that addresses the plant. This Condition supersedes Standard Condition 6.

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. The heater will be equipped with Ultra Low-NO_x burners and Selective Catalytic Reduction (SCR) for control of NO_x emissions.

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, SCR

2.1.3 Applicability Provisions and Emission Standards

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 For Which Construction, Reconstruction, Or Modification Commenced After May 14, 2007, 40 CFR 60 Subpart Ja, 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 affected heater and the Permittee shall comply with all applicable requirements of 40 CFR 60 Subpart Ja, as adopted by USEPA, which, in the event of inconsistency with the provisions of this permit, shall supersede the provisions of this permit.

Note: Effective December 22, 2008, provisions in 40 CFR Part 60, Subpart Ja addressing flares and process heaters for nitrogen oxides and sulfur limits were

stayed until a final decision is reached on these issues. The provisions of the NSPS, Subpart Ja in this permit reflect the provisions that have been stayed.

A. The affected heater is subject to 40 CFR 60.102a(g)(1)(ii), which provides that the owner or operator shall not burn in any fuel gas combustion device any fuel gas that contains H_2S in excess of 162 ppmv determined hourly on a 3-hour rolling average basis and H_2S in excess of 60 ppmv determined daily on a 365 successive calendar day rolling average basis [40 CFR 60.102a(g)(1)(ii)].

Note: While the affected heater is subject to the H_2S limitations in 60.102a(g)(1)(ii), this permit is issued based on the affected heater being exempt from the monitoring requirements under 40 CFR 60.107a(a)(3)(ii) and (iii) as the affected heater will combust only inherently low sulfur streams.

B. The affected heater is subject to 40 CFR 60.102a(g)(2), which provides that the owner or operator shall not discharge to the atmosphere any emissions of NO_x in excess of 40 ppmv (dry basis, corrected to 0 percent excess air) on a 24-hour rolling average basis.

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 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 Provisions

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. i. 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.

ii. The affected heater shall be equipped with SCR for the reduction of NO_x emissions. The Permittee shall operate the SCR in accordance with written procedures developed by the Permittee, including periodic

inspection, routine maintenance and prompt repair of defects.

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.

c. For the affected heater, the Permittee shall conduct a root cause analysis of any exceedance of 40 CFR 60.102a(g)(1) or process start-up, shutdown, upset, or malfunction that causes a discharge to the atmosphere in excess of 227 kilograms per day (kg/day) (500 lb per day (lb/day)) of SO_2. For any root cause analysis performed, the owner or operator shall record the identification of the affected facility, the date and duration of the discharge, the results of the root cause analysis, and the action taken as a result of the root cause analysis. [40 CFR 60.103a(b)]

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)		
CO	VOM	PM/PM_{10}
0.0096	0.0050	0.0075

Note: The affected heater is subject to standards of 60 and 40 ppmvd for H_2S and NO_x, respectively, pursuant to the NSPS. (See Condition 2.1.3(b)(ii)(A) and (B).)

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}
66.4	15.3	3.0	8.0	12.0

2.1.7 Testing Requirements

a. Testing 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 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
Carbon Monoxide	USEPA Method 10

b. NSPS Testing Requirements

i. The Permittee shall conduct performance tests for the affected heater to demonstrate initial compliance with applicable emissions limits in 40 CFR 60.102a according to the requirements of 40 CFR 60.8. The notification requirements of 40 CFR 60.8(d) apply to the initial performance test and to subsequent performance tests required by the Illinois EPA or USEPA but do not apply to performance tests conducted for the purpose of obtaining supplemental data because of continuous monitoring system breakdowns, repairs, calibration checks, and zero and span adjustments [40 CFR 60.104a(a)].

ii. In conducting the performance tests required by 40 CFR 60 subpart Ja (or as requested by the USEPA or Illinois EPA), the Permittee shall use the test methods in 40 CFR part 60, Appendices A-1 through A-8 or other methods as specified in 40 CFR 60.104a, except as provided in 40 CFR 60.8(b) [40 CFR 60.104a(c)].

iii. The Permittee shall determine compliance with the SO_2 and NO_x emissions limits in 40 CFR 60.102a(g) according to the test methods and procedures specified in 40 CFR 60.104a(i)(1) through (5), as applicable [40 CFR 60.104a(i)].

iv. The Permittee shall determine compliance with the H_2S emissions limit in 40 CFR 60.102a(g) according to the test methods and procedures specified in 40 CFR 60.104a(j)(1) through (4), as applicable [40 CFR 60.104a(j)].

Note: Performance tests are not required when a new affected fuel gas combustion device is added to a common source of fuel gas that previously demonstrated compliance. Linde has indicated that it

plans to rely on testing data performed at the CITGO refinery for the fuel gas stream entering the hydrogen plant.

2.1.8 Monitoring Requirements

a. For the affected heater, the Permittee shall install, operate, calibrate, and maintain an instrument for continuously monitoring and recording the concentration (dry basis, zero percent excess air) of NO_x emissions into the atmosphere. The monitor must include an O_2 monitor for correcting the data for excess air [40 CFR 60.107a(c)].

i. The Permittee shall install, operate, and maintain each NO_x monitor according to Performance Specification 2 of Appendix B to 40 CFR 60. The span value of this NO_x monitor is 200 ppmv NO_x. [40 CFR 60.107a(c)(1)]

ii. The Permittee shall conduct performance evaluations of each NO_x monitor according to the requirements in 40 CFR 60.13(c) and Performance Specification 2 of Appendix B to 40 CFR 60. The Permittee shall use Methods 7, 7A, 7C, 7D, or 7E of Appendix A-4 to 40 CFR 60 for conducting the relative accuracy evaluations. The method ANSI/ASME PTC 19.10-1981, "Flue and Exhaust Gas Analyses," (incorporated by reference--see 40 CFR 60.17) is an acceptable alternative to EPA Method 7 or 7C of Appendix A-4 to 40 CFR 60 [40 CFR 60.107a(c)(2)].

iii. The Permittee shall install, operate, and maintain each O_2 monitor according to Performance Specification 3 of Appendix B to 40 CFR 60. The span value of this O_2 monitor must be selected between 10 and 25 percent, inclusive [40 CFR 60.107a(c)(3)].

iv. The Permittee shall conduct performance evaluations of each O_2 monitor according to the requirements in 40 CFR 60.13(c) and Performance Specification 3 of Appendix B to 40 CFR 60. Method 3, 3A, or 3B of Appendix A-2 to 40 CFR 60 shall be used for conducting the relative accuracy evaluations. The method ANSI/ASME PTC 19.10-1981, "Flue and Exhaust Gas Analyses," (incorporated by reference--see 40 CFR 60.17) is an acceptable alternative to EPA Method 3B of Appendix A-2 to 40 CFR 60 [40 CFR 60.107a(c)(4)].

v. The Permittee shall comply with the quality assurance requirements in Procedure 1 of Appendix F to part 60 for each NO_x and O_2 monitor, including quarterly accuracy determinations for NO_x monitors, annual

accuracy determinations for O_2 monitors, and daily calibration drift tests [40 CFR 60.107a(c)(5)].

b. This permit is issued based on the fuel gas streams to the affected heater being inherently low in sulfur content as described in 40 CFR 60.107a(a)(3)(ii) and (iii). As a consequence, the Permittee is not required to comply with the monitoring requirements of 40 CFR 60.107a(a)(2).

c. Excess emissions. For the purpose of reports required by 40 CFR 60.7(c), periods of excess emissions for fuel gas combustion devices subject to the emissions limitations in 40 CFR 60.102a(g) are defined as specified in 40 CFR 60.107a(f)(1) through (4) (See applicable paragraph below). Note: Determine all averages as the arithmetic average of the applicable 1- hour averages, e.g., determine the rolling 3-hour average as the arithmetic average of three contiguous 1-hour averages [40 CFR 60.107a(f)].

i. All rolling 24-hour periods during which the average concentration of NO_x as measured by the NO_x continuous monitoring system required under paragraph 40 CFR 60.107a(c) exceeds 40 ppmv [40 CFR 60.107a(f)(3)].

2.1.9 Recordkeeping Requirements

a. The Permittee shall comply with the notification, recordkeeping, and reporting requirements in 40 CFR 60.7 and other requirements as specified in 40 CFR 60.108a [40 CFR 60.108a(a)].

i. The Permittee shall maintain the following records:

A. For each fuel gas stream to which one of the exemptions listed in 40 CFR 60.107a(a)(3) applies, records of the specific exemption determined to apply for each fuel stream [60.108a(c)(5)];

B. A copy of each root cause analysis of a discharge as specified by 40 CFR 60.103a(b);

C. Records for discharges greater than 500 lb/day SO_2. These records shall include:

1. A description of the discharge.

2. The date and time the discharge was first identified and the duration of the discharge.

3. The measured or calculated cumulative quantity of gas discharged over the discharge duration. If the discharge duration exceeds 24 hours, record the discharge quantity for each 24-hour period. Engineering calculations are allowed.

4. The measured or estimated concentration of H_2S, TRS and SO_2 of the stream discharged.

5. The cumulative quantity of H_2S and SO_2 released into the atmosphere assuming 99 percent conversion of H_2S to SO_2.

6. Results of any root-cause analysis conducted as required in 40 CFR 60.103a(b).

b. 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.

c. 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.

d. 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, PM_{10}, and SO_2 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 USEPA and Illinois EPA of the specific monitoring provisions of 40 CFR 60.107a with which it seeks to comply. Notification shall be submitted with the notification of initial startup required by 40 CFR 60.7(a)(3).

b. The Permittee shall submit excess emissions reports for all periods of excess emissions as defined by the NSPS, which reports shall be submitted in accordance with the requirements of 40 CFR 60.7(c) except that the reports shall contain the information specified in 40 CFR 60.108a(d)(1) through (7).

c. The Permittee shall notify the Illinois EPA of deviations of the affected heater with the permit requirements that are not addressed by excess emission reports required by Condition 2.1.10(b). 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 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.

c. 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 60 Subpart GGGa are more stringent than the LDAR requirements in 35 IAC 218.445-452, compliance with 40 CFR Part 60 Subpart GGGa shall be deemed compliance with 35 IAC 218.445-452.

2.2.4 Non-Applicability of Regulations of Concern

a. 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. Note, however, the affected components are required to comply with the standards identified in Subpart GGGa (See Condition 2.2.5).

b. This permit is issued based on the affected components not being subject to NESHAP for Petroleum Refineries, 40 CFR 63, Subpart CC because the affected components are not in organic hazardous air pollutant service, i.e., the affected components contains or contact a fluid (liquid or gas) that is less than 5 percent by weight of total organic HAP's.

2.2.5 Control Requirements and Work Practices

a. The affected components are subject to 40 CFR 60.592a: Equipment Leak Standards.

i. Pursuant to 40 CFR 60.592a(a), the affected components shall meet the requirements of 40 CFR 60.482–1a to 60.482–10a no later than 180 days after initial startup.

ii. Pursuant to 40 CFR 60.592a(b), for a given process unit, an owner or operator may elect to comply with the requirements of 40 CFR 60.483-1a or 60.483-2a as an alternative to the requirements in 40 CFR 60.482–7a.

iii. The permit is issued based on the hydrogen product compressors being in hydrogen service. As a consequence, the hydrogen product compressors are exempt from the requirements of 40 CFR 60.592a, pursuant to 40 CFR 60.593a(b)(1).

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 60.485a as required by 40 CFR 60.592a(d).

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 60.486a as required by 40 CFR 60.592(e). 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 60.487a as required by 40 CFR 60.592(e).

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)	Emissions (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 or other emergency release points 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 Applicability Provisions and Emission Standards

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 (H_2S) 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.

   Note: This permit does not address certain amendments to the NSPS for Petroleum Refineries proposed by USEPA (72 FR 27178, May 14, 2007). This is because USEPA has not completed the adoption of these amendments. If USEPA completes the adoption of these amendments, the provisions of the adopted rules would apply to new and modified

emission units that are part of this project, as specified by the provisions of the adopted rules. As the adopted standards are more stringent than the standards of the current NSPS, which are provided in the above conditions, the provisions of the adopted NSPS would supersede the above conditions.

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 Provisions

This permit is issued based on the flare not being subject to the NSPS for Petroleum Refineries For Which Construction, Reconstruction, Or Modification Commenced After May 14, 2007, 40 CFR 60 Subpart Ja because the Permittee commenced construction of the flare prior to June 24, 2008 through a binding purchase order. (See also 40 CFR 60.100a(b).)

2.4.5 Control Requirements and Work Practices

None.

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 SO_2 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 H_2S 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/PM_{10}, and SO_2 (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.

It should be noted that this permit has been revised to address installation of a Selective Catalytic Reduction system to control NO_x emissions from the Hydrogen Plant Reformer, accompanied by a reduction in the permitted NO_x emissions of the Hydrogen Plant. The revised permit also includes provisions of the New Source Performance Standards, 40 CFR 60, Subpart Ja, which were adopted by USEPA on June 24, 2008, that now apply to the Reformer, rather than the provisions of the NSPS 40 CFR 60 Subpart J.

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

Edwin C. Bakowski, P.E. Date Signed: _____
Manager, Permit Section
Division of Air Pollution Control

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	0.28	0.39
115B-2	6.45	6.45	5.98	2.12	0.39	0.21	0.51
Unit 119, Trains A & B	-20.57	-20.57	-621.29	0	-6.77	-0.88	-1.21
Unit 121, Trains C & D	12.18	12.18	57.59	146.57	6.23	0.91	0.71
South Plant Cooling Tower	----	----	----	----	1.90	-9.53	-4.56
Components	----	----	----	----	6.03	----	----
Amine Treatment	----	----	----	----	0.21	----	----
SUBTOTAL[1]:	46.49	46.49	114.53	166.74	16.54	5.60	5.81
Hydrogen Plant							
Reformer	66.40	66.40	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	0.03	0.03
SUBTOTAL:	66.60	66.60	20.70	3.00	18.00	12.03	12.03
TOTAL:	113.09	113.09	135.23	169.74	34.54	17.63	17.84
Significance Threshold:	40	40	100	40	40	25	15
Greater Than Significant?	Yes	Yes	Yes	No	No	No	Yes

Notes:

[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 PM_{10}.

Attachment 2: Netting Analysis (Tons/Year)

	Date	NO_x (MSSCAM)	NO_x (PSD)	CO	SO_2	PM_{10}
Project Emissions[1]		92.52	92.52	-486.06	169.74	12.07
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		-444.98	-65.12	-307.07	-457.83	6.70
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 SO_2 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.