northwest Clean Air agency

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Original Issuance: October 7, 2002
Revision a: September 13, 2004
Revision b: August 19, 2013
Revision c: February 25, 2014

Northwest Clean Air Agency (NWCAA) hereby issues Order of Approval to Construct (OAC) 813c

Project Summary: Construct and operate a steam methane reformer (SMR) located within the boundaries of the Shell Puget Sound Refinery to supply up to 7.7 million standard cubic feet of hydrogen gas per day to the refinery's hydrogen system. Products of combustion will be emitted from the SMR reactor and from the flare. Maximum heat input to the SMR reactor in the form of natural gas and pressure swing adsorption (PSA) off-gas is 80.2 MMBtu/hour (higher heating value).

Approved Emission Unit:

- One (1) SMR reactor with a heat input capacity of 80.2 MMBtu/hr (higher heating value)
- One (1) elevated, non-assisted flare

Owner/Operator	Facility Name and Location
Air Liquide L.P. 2700 Post Oak Blvd, Suite 1800 Houston, Texas 77056 Contact: John Jackson Plant Manager	Air Liquide L.P. 8581 South Texas Road Anacortes, EA 98221

Permit History

- As of the date of issuance, this Order supersedes NWCAA OAC 813b issued August 19, 2013.

Note that in addition to other applicable rules and regulations, one of the approved emission units is subject to applicable portions of the following federal regulations:

New Source Performance Standards (NSPS)

- 40 CFR 60 Subpart A - General Provisions
- 40 CFR 60 Subpart J - Standards of Performance for Petroleum Refineries

National Emission Standards for Hazardous Air Pollutants (NESHAP)/Maximum Achievable Control Technology Standards (MACT)

- 40 CFR 63 Subpart A – General Provisions
- 40 CFR 63 Subpart DDDDD - National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters

As authorized by Northwest Clean Air Agency Regulation Section 300, this order is issued subject to the following restrictions and conditions[1]:

1. The flare pilot system shall use only pipeline grade natural gas and the sweep for the flare shall be nitrogen.

2. The SMR shall not exceed a firing rate of 80.2 MMBtu/hour and shall combust only pipeline grade natural gas and PSA off-gas.

3. The following parameters shall be recorded and records kept for a period of no less than three years.

    a. The quantity of natural gas and PSA off-gas combusted in the SMR,

    b. The valve position data used to calculate flow(s) to the flare during flaring events, and

    c. An explanation as to the cause of each flaring event.

4. The flare shall be operated with a pilot flame which shall be continuously monitored using a thermocouple or other equivalent device.

5. Visible emissions from the SMR stack or flare shall not exceed five percent (5%) opacity for more than six minutes in any one hour as determined by EPA Method 9.

6. Nitrogen oxide emissions from the SMR stack shall not exceed 2.8 pound/hour based on a 1-hour average.

7. Carbon monoxide emissions from the SMR stack shall not exceed 1.7 pounds/hour based on a 1-hour average.

8. Compliance with conditions 6 and 7 shall be determined by an annual performance test. Unless approved in writing in advance by the NWCAA, all testing shall be conducted as follows:

    - Testing and submittal of test plans and reports shall be conducted in accordance with NWCAA Section 367 and NWCAA Appendix A
    - During testing the Heater shall be fired at 90% or more of its maximum rated capacity

[1] Nothing in this permit is intended to, or shall, alter or waive any applicable law [including but not limited to defenses, entitlements, challenges or clarifications related to the Credible Evidence Rule, 62. Fed. Reg. 8315 (Feb. 27, 1997)] concerning the use of data for any purpose under the Act, generated by the reference method specified herein or otherwise.

Pursuant to Section 300.10 of the NWCAA Regulation and RCW 43.21B, this Order may be appealed to the Pollution Control Hearings Board (PCHB). To appeal to the PCHB, a written notice of appeal must be filed with the PCHB and a copy served upon the NWCAA within 30 days of the date the applicant receives this Order. Additional information regarding appeal procedures can be found at: www.eho.wa.gov under PCHB.

- NOx: 40 CFR 60 Appendix A Methods 1, 2, 3A, 4, and 7E
- CO: 40 CFR 60 Appendix A Methods 1, 2, 3A, 4, and 10

The first test shall be conducted before July 30, 2014. Thereafter, compliance shall be demonstrated by conducting annual testing no later than 12 months after the most recent test.

9. NOx emissions from the flaring of process gasses shall not exceed 0.50 (5.0×10^{-1}) tons per calendar year (not including emissions from the flare pilot). This emission limit shall include periods of plant startup, shutdown, malfunction and during periods of load discrepancies. An emission factor of 0.0641 lb/MMBtu lower heating value (TNRCC Document RG-109, October 2000 draft) shall be used to calculate emissions. This calculation may be revised if a more accurate emission factor becomes available. Any change in the emission factor shall be mutually agreed upon by Air Liquide and the NWCAA and incorporated into this OAC with a corresponding change in the mass emission limit. The plant shall keep monthly records on the calculated NOx emissions from the flare. These monthly records shall include the pounds of NOx emitted during the month and the calendar year total to date.

Christos Christoforou, P.E.
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Assistant Director

Revision a: Reformat. Clarify conditions 1, 3, 4 and 5. Add condition 3b. Change condition 10 by removing the requirement to notify NWCAA of initial startup as it was received on October 14, 2003 and at the request of Air Liquide add an annual NOx limit for the flare with associated recordkeeping.

Revision b: Revise NOx and CO limits in Conditions 6 and 7 from a three hour rolling average to a 1 hour average (same numerical limit). Revise Condition 8 from an initial stack test to an annual stack test. Remove Condition 9 as part of the OAC cleanup.

Revision c: Include 40 CFR 63 Subpart DDDDD and 40 CFR 60 Subpart J in the preamble of the OAC. Remove lb/MMBtu limits for NOx and CO. Clarify Conditions 5 (opacity) and 8 (testing).