

United States Environmental Protection Agency
Region 8
Air Program
1595 Wynkoop Street
Denver, Colorado 80202-1129
January 27, 2014



Air Pollution Control
Prevention of Significant Deterioration (PSD)
Permit to Construct

PSD-WY-000004-2012.001

Permittee:

Solvay Soda Ash Joint Venture
Green River Soda Ash Plant
P. O. Box 1167
Green River, WY 82935

Permitted Facility:

Green River Soda Ash Plant Green River, Wyoming

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Table of Acronyms

BACT	Best Available Control Technology
CEM	Continuous Emission Monitor
CFR	Code of Federal Regulations
CH ₄	Methane
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CO _{2e}	Carbon Dioxide Equivalent
EP	Emission Point
FIP	Federal Implementation Plan
FR	Federal Register
GHG	Greenhouse Gas
hr	Hour
lb	Pound
lbpy	Pounds Per Year
MMBtu	Million British Thermal Unit
Mscf	Million Standard Cubic Foot
N ₂ O	Nitrous Oxide
NSPS	New Source Performance Standards
NO _x	Nitrogen Oxides
PSD	Prevention of Significant Deterioration
PTE	Potential to Emit
QA/QC	Quality Assurance and/or Quality Control
SF ₆	Sulfur Hexafluoride
tpy	Tons Per Year
VOC	Volatile Organic Compounds
%	Percent

I. INTRODUCTION

This Federal Prevention of Significant Deterioration (PSD) permit is being issued under authority of 40 CFR 52.21 (PSD) and 52.37 (Federal Implementation Plan (FIP) to issue permits under the PSD requirements to sources that emit greenhouse gases (GHGs). Green River Soda Ash Plant (hereinafter the "Permittee" or "Solvay") proposes to construct a new natural gas fired boiler that will add steam-generating capacity to the Solvay facility. The addition of this natural gas fired boiler with the two existing coal-fueled boilers will allow Solvay the operational flexibility to (1) shut any one of the three boilers down for maintenance without curtailing production, and (2) take advantage of the lower-cost fuel (coal vs. natural gas).

With this project, Solvay expects to increase annual soda ash production by approximately 14 percent. This permit modification assumes no operational limit on combined steam production, and the additional boiler will be permitted to operate at capacity. In this way, the gas-fueled boiler could run at its maximum while the coal boilers would supplement as needed, or the coal-fueled boilers could operate at their capacity while the gas boiler would supplement the steam demand.

This additional boiler is a water tube package natural gas fired, 254 MMBtu/hr boiler (Foster Wheeler Model AG 5195) that was installed previously in Garfield County, Colorado at the American Soda facility. It was used from 2000 through May 2004 and then permanently shut down. It is a boiler capable of producing 200,000 lbs. of steam per hour, to be added in parallel to the two 300,000 lbs. per hour coal boilers. In 2003, Solvay purchased the American Soda facility in Garfield County, Colorado, including the Foster Wheeler Model AG 5195 natural gas fired boiler. The boiler will be fueled through the Western Gas Pipeline by a spur currently feeding the Solvay plant.

II. GENERAL PERMIT CONDITIONS

On the basis of findings set forth in Section III, Special Permit Conditions, of this permit, and pursuant to the authority (as delegated by the Administrator) at 40 CFR 52.37, EPA hereby authorizes Solvay to construct the natural gas fired boiler. The authorization is expressly conditioned as follows:

A. PERMIT EFFECTIVE DATE AND EXPIRATION

As provided in 40 CFR 124.15(b), this PSD permit shall become effective 30 days after the service of notice of the permit decision, unless:

1. a later effective date is specified in the decision;
2. review is requested on the permit under 40 CFR 124.19; or
3. no comments requested a change in the draft permit, in which case the permit shall become effective immediately upon issuance.

As no comments were received during the public comment period, this permit shall become effective immediately upon issuance.

As provided in 40 CFR 52.21(r)(2), this PSD permit shall become invalid if construction:

1. is not commenced (as defined in 40 CFR 52.21(b)(9)) within 18 months after the approval takes effect; or
2. is discontinued for a period of 18 months or more; or
3. is not completed within a reasonable time.

Under 40 CFR 52.21(r)(2), EPA may extend the 18 month period upon a satisfactory showing that an extension is justified.

B. PERMIT NOTIFICATION REQUIREMENTS

The Permittee shall notify EPA in writing of:

1. the date construction is commenced, postmarked within 30 days of such date;
2. the actual date of initial startup, postmarked within 15 days of such date. Startup is defined as the setting in operation of an affected facility for any purpose;
3. the date upon which initial performance tests will commence, in accordance with the provisions of Section V., Performance Testing Requirements, of this permit, postmarked not less than 30 days prior to such date; and
4. other events as required elsewhere in this permit.

C. FACILITY OPERATION

At all times, including periods of startup, shutdown, and malfunction, Permittee shall maintain and operate the facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing GHG emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the EPA, which may include, but is not limited to, monitoring results, review of operating maintenance procedures and inspection of the facility.

D. MALFUNCTION REPORTING

1. The Permittee shall notify EPA by mail within 2 working days following the discovery of any failure of air pollution control equipment, process equipment, or of a process to operate in a normal manner, which results in an increase in CO_{2e} emissions above the allowable emission limits stated in Condition III.A. Point Source Emission Limits, of this permit.
2. In addition, the Permittee shall notify EPA in writing within 15 calendar days of any such failure described under Section IV. Recordkeeping Requirements. This notification shall include a description of the malfunctioning equipment or abnormal operation, the date of the initial malfunction, the period of time over which emissions were increased due to the failure, the cause of the failure, the estimated resultant emissions in excess of those allowed in Condition III.A. Point Source Emission Limits, and the methods utilized to mitigate emissions and restore normal operations.
3. Compliance with this malfunction notification provision shall not excuse or otherwise constitute a defense to any violation of this permit or any law or regulation such malfunction may cause.

E. RIGHT OF ENTRY

EPA authorized representatives, upon the presentation of credentials, shall be permitted:

1. to enter the premises where the facility is located or where any records are required to be kept under the terms and conditions of this PSD Permit;
2. during normal business hours, to have access to and to copy any records required to be kept under the terms and conditions of this PSD Permit;
3. to inspect any equipment, operation, or method subject to requirements in this PSD Permit; and,
4. to sample materials and emissions from the source(s).

F. TRANSFER OF OWNERSHIP

In the event of any changes in control or ownership of the facilities to be constructed under this PSD permit, this PSD permit is binding on all subsequent owners and operators. The Permittee shall notify, by letter, the succeeding owner and operator of the existence of this PSD permit and its conditions. A copy of the letter shall be provided to EPA within 30 days of the letter signature. Permit transfers shall be made in accordance with 40 CFR Part 122, Subpart D.

G. SEVERABILITY

The provisions of this PSD permit are severable, and, if any provision of the PSD permit is held invalid, the remainder of this PSD permit shall not be affected.

H. ADHERENCE TO APPLICATION AND COMPLIANCE WITH OTHER ENVIRONMENTAL LAWS

The Permittee shall construct and operate this project in compliance with this PSD permit, the application on which this PSD permit is based, and all other applicable federal, state, and local air quality regulations. This PSD permit does not release the Permittee from any liability for compliance with other applicable federal, state and local environmental laws and regulations, including the Clean Air Act.

I. BINDING APPLICATION

This permit is issued in reliance upon the accuracy and completeness of the information set forth in the Permittee's application to EPA dated August 2012, and subsequent information provided by the Permittee to EPA, as listed in the Administrative Record for issuance of this permit.

The Permittee shall abide by all representations, statements of intent and agreements contained in the permit application and subsequent submittals as listed in the Administrative Record. EPA shall be notified no less than 10 working days in advance of any significant deviation from the permit application, and shall furnish any plans, specifications or supporting data regarding such deviation. The issuance of this PSD permit to Construct and Operate may be suspended or revoked if EPA determines that a significant deviation from the permit application, specifications, and supporting data furnished has been, or is to be, made.

J. ENFORCEABILITY OF PERMIT

On the effective date of this permit, the conditions herein become enforceable by EPA pursuant to any remedies it now has or may have in the future, under the Clean Air Act.

K. TREATMENT OF EMISSIONS

Emissions in excess of the limits specified in this permit shall constitute a violation.

III. SPECIAL PERMIT CONDITIONS

A. POINT SOURCE EMISSION LIMITS

At all times after completion of the installation of the natural gas fired boiler, including during startup, shutdown and malfunction, the Permittee shall not allow the discharge of GHG emissions from the unit into the atmosphere, in excess of the following:

Table 1: Emission Limits

Emission Point/Equipment	Limitations
Foster Wheeler Model AG 5195, 254 MMBtu/hr natural gas fired boiler	<ul style="list-style-type: none"> • 125.3lb per MMBtu based on a 24 hour rolling average • 130,263 ton CO_{2e} /365 day based on 365-day rolling average

B. REQUIREMENTS FOR NATURAL GAS FIRED BOILER

1. Compliance with lb CO_{2e} /MMBtu BACT Emission Limit

The above listed emission unit shall demonstrate compliance with the lb CO_{2e}/MMBtu BACT emission limit by the following equation:

Equation 1

$$CO2 \geq (5.18 \times 10^{-7} \times C_{CO2} \times Q \times 2204.62) \div (V_{Hi} \times 1020)$$

Where:

- CO2 = 24 hour rolling average limit in Special Condition III.A,
- C_{CO2} = Hourly average CO₂ concentration (% CO₂)
- Q = Hourly average stack gas volumetric flow rate (scfh)
- 5.18 x 10⁻⁷ = Conversion factor (metric tons/scf/% CO₂)
- 2204.62 = Conversion factor (lbs/metric tons)
- 1020 = Conversion factor (MMBtu/Mscf)
- V_{Hi} = Hourly volumetric flow rate of natural gas to the boiler (Mscf)

2. Compliance with ton CO_{2e} / 365 day BACT Emission Limit

The above listed emission unit shall demonstrate compliance with the ton CO_{2e}/yr BACT emission limit by the following equation:

Equation 2

$$T_{CO_2e} \geq \sum_{i=1}^{365} \frac{(W_{CO_2e} \times 1020 \times V_{Di})}{2000}$$

Where:

T _{CO_{2e}} =	130,263 CO _{2e} ton/yr limit in Special Condition III.A, Table 1
W _{CO_{2e}} =	117 lb CO _{2e} /MMBtu
1020 =	Conversion factor (MMBtu/Mscf)
V _{Di} =	Daily average volumetric flow rate of natural gas to the boiler (Mscf)
2000 =	Conversion factor (lb/ton)

3. Work Practice and Operational Requirements

- a. To demonstrate compliance with the BACT emission limits the Permittee shall calculate the lb CO_{2e}/MMBtu at least once every day. The Permittee shall monitor and record hourly average CO₂ concentrations (% CO₂) and hourly average stack gas volumetric flow rate (scfh) from the boiler at least once a day. The Permittee shall monitor and record the hourly volumetric flow rate of natural gas to the boiler (Mscf) at least once per hour.
- b. Compliance with the 365-day rolling average ton CO_{2e}/365-day BACT emission limit shall be determined at least once every day after 365 days of data have been recorded. The Permittee shall monitor and record the daily average volumetric flow rate of natural gas to the boiler (Mscf) at least once a day
- c. The Permittee shall compare the calculated CO_{2e} emissions from Special Condition III.B.1. Compliance with lb CO_{2e} /MMBtu BACT Emission Limit and Special Condition III.B.2. Compliance with ton CO_{2e} / 365 day BACT Emission Limit to the allowable BACT CO_{2e} limit required in Special Condition III.A Point Source Emission Limits. The calculated CO_{2e} emissions shall be less than the allowable BACT CO_{2e} limit. If the Permittee finds that the calculated CO_{2e} emissions rate is greater than the allowable BACT CO_{2e} limit, the Permittee shall review the operational performance of the emission unit and monitoring instrumentation. From this review, any necessary corrective measures shall be identified and recorded by the Permittee, including the reason for the CO₂ emissions difference. The Permittee shall complete

corrective measures within 48 hours of identification of a difference and comply with Section IV., Recordkeeping Requirements.

- d. The Permittee shall install, maintain and operate a non-resettable elapsed flow meter, to measure the flow rate of the fuel combusted in the natural gas fired boiler. Flow rate will be recorded at least once per hour, averaged daily, and recorded as Mscf.
- e. The Permittee shall install, maintain and operate a continuous emission monitor (CEM) on the exit stack of the natural gas fired boiler to monitor hourly average CO₂ concentrations (% CO₂). Hourly average CO₂ concentrations will be recorded at least once per day and recorded as (% CO₂).
- f. The Permittee shall install, maintain and operate a flow meter to measure the hourly average stack gas volumetric flow rate (scfh) exiting the natural gas fired boiler. This shall be recorded at least once per day and recorded as scf.
- g. The Permittee shall install and maintain a minimum of 4 inches of insulation around the boiler at all times.
- h. The Permittee shall install, maintain and operate NO_x control requirements as required by the Wyoming DEQ PSD permit for this boiler.
- i. The Permittee shall install, maintain and operate during all times, a boiler blowdown tank and in-stack economizer.
- j. The Permittee shall ensure that all ducting for boiler intake air draws air from at or above the process building roofline.
- k. The Permittee shall ensure that the natural gas boiler is integrated into the existing Solvay steam production system.
- l. The Permittee shall ensure that Maintenance and Operation requirements that include yearly steam line inspections, maximized condensate recovery and usage of an anti-scalant additive to the boiler feed water are established and implemented for this natural gas fired boiler.
- m. The Permittee shall maintain and operate the emission unit to ensure the GHG emissions are continuously at or below the emissions limits specified in this permit.

IV. RECORDKEEPING REQUIREMENTS

- A.** Including any recordkeeping requirements specified elsewhere in this permit, the Permittee shall maintain a file of all records, data, measurements, reports, and documents related to the operation of this boiler, including, but not limited to, the following: all records or reports pertaining to significant maintenance performed on any system or device related to the operation of this boiler; all records relating to performance tests and monitoring of auxiliary combustion equipment; and other information required by this permit recorded in a permanent form suitable for inspection. The file must be retained for not less than 5 years following the date of such measurements, maintenance, reports, and/or records.
- B.** The Permittee shall maintain the following records for at least 5 years, including:
1. the occurrence and duration of any startup, shutdown, malfunction;
 2. duration of any initial shakedown period for the emission unit;
 3. calibration tests of flow meters required by Condition V.A. Performance Testing Requirements used to demonstrate compliance with this permit;
 4. the time and duration of any periods that monitoring devices are not operating;
 5. all data recorded in compliance with Special Conditions III.B.1. Compliance with lb CO_{2e} /MMBtu BACT Emission Limit through III.B.3. Work Practice and Operational Requirements; and
 6. all CEMs testing, maintenance, and calibration checks conducted to satisfy quality assurance requirements under Condition V.B. Performance Testing Requirements.
- C.** The Permittee shall maintain records of any exceedance of limitations in this permit and submit a written report of all exceedances to EPA semi-annually except when: more frequent reporting is specifically required by an applicable subpart; or the authorized representative of the Administrator, on a case-by-case basis, determines that more frequent reporting is necessary to accurately assess the compliance status of the source. The report is due on the 30th day following the end of each semi-annual period and shall include the following:
1. time intervals, data and magnitude of the exceedance, the nature and cause (if known), corrective actions taken and preventative measures adopted;
 2. applicable time and date of each period during which the monitoring equipment was inoperative (monitoring down-time);

3. if no exceedances of a permit limit occurred during the reporting period or the monitoring equipment has not been inoperative, repaired or adjusted, a statement that no exceedance of that limit occurred, and/or that the monitoring equipment has not been inoperative, repaired or adjusted (as applicable), shall be submitted;
 4. any failure to conduct any required source testing, monitoring, or other compliance activities; and
 5. any violation of limitations on operation, including but not limited to restrictions on hours of operation of the emergency generator.
- D. Exceedance shall be defined as any period in which the facility emissions or other parameter of operation exceed a maximum limit set forth in this permit.
- E. Excess emissions indicated by GHG emission source certification testing or compliance monitoring shall be considered violations of the applicable emission limit for the purpose of this permit.
- F. All records required by this PSD Permit shall be retained for not less than 5 years following the date of such measurements, maintenance, and reports.

V. **PERFORMANCE TESTING REQUIREMENTS**

- A. The Permittee shall calibrate, according to manufacturer's specifications, all flow meters used to comply with Special Condition III.B.3.d. Work Practice and Operational Requirements at least once per calendar year.
- B. The Permittee shall calibrate daily the CEM used to comply with Special Condition III.B.3.e. Work Practice and Operational Requirements, according to manufacturer's specifications. In addition, the Permittee shall perform a relative accuracy test audit of the CEM used to comply with Special Condition III.B.3.e. Work Practice and Operational Requirements at least once per calendar year. This test audit shall be conducted under the procedures described in 40 CFR Part 60, Appendix F.
- C. The Permittee shall maintain records of all performance tests as required under Special Condition IV. A. 6. Recordkeeping Requirements.

VI. AGENCY NOTIFICATIONS

- A.** The Permittee shall submit GHG permit applications, permit amendments, and other applicable permit information to:

Air Program (8P-AR)
US EPA Region 8
1595 Wynkoop St.
Denver, CO 80202

- B.** The Permittee shall submit a copy of all compliance and enforcement correspondence as required by this permit to:

Air Technical Enforcement Program (8ENF-AT)
US EPA Region 8
1595 Wynkoop St.
Denver, CO 80202

- C.** For any notifications required to be delivered to EPA within a certain time frame, fulfillment of the requirement can be accomplished by delivery of the required information to EPA in writing, postmarked by such date.

Authorized By: United States Environmental Protection Agency, Region 8



Debra H. Thomas
Acting Assistant Regional Administrator
Office of Partnerships and Regulatory Assistance (OPRA)

Date: 1/27/14

