United States Environmental Protection Agency
Region 8
Air Program
1595 Wynkoop Street
Denver, Colorado 80202-1129
September 27, 2012

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

PSD-WY-000001-2011.001

Permittee:
Owner: Cheyenne Light, Fuel & Power / Black Hills Power, Inc.
Operator: Black Hills Service Company
P.O. Box 1400
625 Ninth Street
Rapid City, South Dakota 57709

Permitted Facility:
Cheyenne Prairie Generating Station
Laramie County, Wyoming

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Table of Acronyms

BACT	Best Available Control Technology
bhp	Brake Horse Power
Btu/hr	British Thermal Units per Hour
CatOx	Catalytic Oxidation
CEMS	Continuous Emission Monitoring System
CFR	Code of Federal Regulations
CGS	Cheyenne Generating Station
CH_4	Methane
CLF&P	Cheyenne Light, Fuel & Power
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_{2e}	Carbon Dioxide Equivalent
dscf	Dry Standard Cubic Foot
EP	Emission Point
FIP	Federal Implementation Plan
FR	Federal Register
FTIR	Fourier Transform Infra-Red Spectroscopy
GC-FID	Gas Chromatograph-Flame Ionization Detector
GE	General Electric
GHG	Greenhouse Gas
gr	Grains
HHV	High Heating Value
hr	Hour
HRSG	Heat Recovery Steam Generator
kWh	Killowatt-Hour
lb	Pound
lbpy	Pounds Per Year
MMBtu/hr	Million British Thermal Units per Hour
MW	Megawatt
MWh	Megawatt-Hour
N_2O	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
RATA	Relative Accuracy Test Audit
Scf/hr	Standard Cubic Feet per Hour
SCR	Selective Catalytic Reduction
SF_6	Sulfur Hexafluoride
tpy	Tons Per Year
VOC	Volatile Organic Compounds
%	Percent

I. INTRODUCTION

This Federal PSD permit is being issued under authority of 40 CFR 52.21 (PSD) and 52.37 (FIP to issue permits under the PSD requirements to sources that emit GHG). Cheyenne Light, Fuel & Power and Black Hills Power, Inc., (hereinafter the "Permittee") proposes to construct a new nominal 220 MW gross simple and combined cycle natural gas-fired combustion turbine power plant in Laramie County, Wyoming. The plant, the Cheyenne Prairie Generating Station, will be located five miles southeast of downtown Cheyenne along Interstate 80. Cheyenne Light, Fuel and Power, as well as Black Hills Power, Inc., are wholly owned subsidiaries of Black Hills Corporation. Cheyenne Light, Fuel and Power was acquired from Xcel Energy in 2005. Cheyenne Light, Fuel and Power Company provides electric utility service to Laramie County, Wyoming. The Cheyenne Prairie Generating Station will be operated by Black Hills Service Company and will include three simple cycle General Electric LM6000 PF SPRINT natural gas turbines, and two General Electric LM6000 PF SPRINT turbines operated in a 2-on-1 combined cycle configuration (each turbine exhausts to its own heat recovery steam generator (HRSG) and that steam is routed to a single steam turbine electric generator). In addition to the turbines the facility will include one wet cooling tower for the combined cycle steam turbine; three electric chiller units, each with cooling towers, for inlet air cooling for the turbine inlet air; six natural gas-fired inlet air heaters to heat the turbine inlet air, two natural gas-fired fuel gas heaters, one diesel emergency generator, and one diesel fire pump.

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) of 52.21(u), EPA hereby conditionally authorizes Black Hills Corporation to construct the Cheyenne Prairie Generating Station. 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 §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 provided in 40 CFR 52.21(r), 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; and

4. 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 means the setting in operation of an affected facility for any purpose;

3. The date upon which initial performance tests will commence, postmarked not less than 30 days prior to such date. Notification may be provided with the submittal of the performance test protocol required pursuant to Condition V.B.; and

4. The date upon which certification tests of the CO_2 and flow rate CEMS will commence, in accordance with 40 CFR 75.61(a)(1)(i) and 40 CFR Part 60, Appendix B, Performance Specification 3 (if the Permittee elects to use CEMS to demonstrate compliance with the lb CO_{2e}/MWh emission limit). Additionally, the initial certification or recertification application shall be submitted for the CO_2 CEMS (if used) as required by 40 CFR 75.63.

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 two 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., of this permit.

2. In addition, the Permittee shall notify EPA in writing within 15 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., 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 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 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 September 23, 2011, 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 days in advance of any significant deviation from the permit application as well as any plans, specifications or supporting data furnished. 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, including during startup, shutdown and malfunction, the Permittee shall not allow the discharge of GHG emissions from each unit into the atmosphere, in excess of the following:

Table 1: Emission Limits

Source ID.	Emission Point/Equipment	Limitations lb/MWh limitations are based on rolling 365-day averages tpy limitations are based on rolling 365-day totals all references to tons represent US short tons (2000lb)
EP01 - EP02	CT01A and CT01B - GE LM6000PF SPRINT Combined Cycle Combustion Turbine (366 MMBtu/hr) with HRSG #1, SCR and CatOx	• 1100 lb CO_{2e} /MWh(gross) per turbine • 187,318 tpy CO_{2e} per turbine • Fuel: pipeline quality natural gas
EP03 - EP05	CT02A, CT02B, CT03A - GE LM6000PF SPRINT Simple Cycle Combustion Turbine (366 MMBtu/hr) with SCR and CatOx	• 1600 lb CO_{2e}/MWh(gross) per turbine • 187,318 tpy per turbine • Fuel: pipeline quality natural gas
EP06 - EP11	Natural Gas-Fired Inlet Air Heaters #1 - #6	• 4,117 tpy CO_{2e} per heater • Fuel: pipeline quality natural gas
EP12 - EP14	Inlet Air Chillers	N/A
EP15	Diesel Emergency/Standby Generator	• 226 tpy CO_{2e} • Not to exceed 500 hours of operation per 12-month period • EPA Tier 2 (or Better) Certified Engine • Rated at $\leq$ 839 bhp • Diesel fuel (#2 grade fuel oil)
EP16	Diesel Fire Pump Engine	• 51 tpy CO_{2e} • Not to exceed 250 hours of operation per 12-month period • EPA Tier 3 (or Better) Certified Engine • Rated at $\leq$ 327 bhp • Diesel fuel (#2 grade fuel oil)
EP17	Wet Cooling Tower	N/A
EP18 - EP19	Natural Gas-Fired Fuel Gas Heater #1 and #2	• 1,153 tpy CO_{2e} per heater • Fuel: pipeline quality natural gas

B. REQUIREMENTS FOR COMBUSTION TURBINES

1. Compliance with Combustion Turbine (CT) BACT Emission Limits

a. The Permittee shall demonstrate compliance with the lb CO_{2e}/MWh(gross) emission limits for each of the CT's (Units EP01- EP05) as follows.

i. The Permittee shall calculate the pounds of CO_2 emitted hourly using the procedure provided in 40 CFR 75.10(a)(3)(i) (direct emission measurement using CEMS) or using the procedure provided in 40 CFR 75.10(a)(3)(ii) (calculation of CO_2 emissions using the equations from 40 CFR 75, Appendix G, using F_c factors updated monthly from fuel analysis), and sum the hourly emissions for each calendar day.

ii. The Permittee shall calculate the pounds of CH_4 and N_2O emitted each calendar day by using the default CH_4 and N_2O emission factors contained in Table C-2 of 40 CFR 98 and the measured actual hourly heat input (HHV). The Permittee shall then calculate the pounds of CO_{2e} (as CH_4 and N_2O) based on the procedures contained in Greenhouse Gas Regulations, 40 CFR 98, Subpart A using the Global Warming Potentials (GWP) listed in Table A-1 of 40 CFR 98, Subpart A.

iii. The Permittee shall sum the daily emissions from Condition III.B.1.a.i., and ii (in pounds of CO_{2e}).

iv. The Permittee shall also measure the hourly gross electrical output in terms of MWh for each hour.

v. At the end of each calendar day the Permittee shall sum the pounds of CO_{2e} emitted that day with the emissions from the previous 364 days, and sum the hourly gross output during the same 365 day period. The average lb CO_{2e}/MWh result for the 365-day period is obtained by dividing the total pounds CO_{2e} emissions value by the total gross energy output (MWh(gross)) value. The result shall be expressed in lbs CO_{2e}/MWh(gross), on a 365-day rolling average.

b. The Permittee shall demonstrate compliance with the tons per year (tpy) emission limits for each of the CT's (Units EP01- EP05) as follows.

i. The Permittee shall calculate the pounds of CO_{2e} emitted each calendar day using the procedures in Condition III.B.1.a.i through iii above, and convert the result into tons.

ii. At the end of each calendar day, the Permittee shall sum the tons of CO_{2e} emitted that day with the tons of CO_{2e} emitted from the previous 364 days, and record the 365-day total.

2. CO_2 Emission Monitor or CO_2 CEMS

a. If the Permittee elects to follow the procedure from 40 CFR 75.10(a)(3)(i), which involves installation, certification, operation and maintenance of a CO_2 CEMS and flow monitoring system, the Permittee shall meet the applicable CEMS requirements, including certification testing, of 40 CFR Part 60, Appendix B, Performance Specification 3, and 40 CFR Part 75.

b. In accordance with 40 CFR 75.4(b)(2), the Permittee shall ensure that all required CO_2 monitoring system/equipment are installed, and all certification tests are completed, on or before 180 calendar days after the date the unit commences commercial operation (as defined in 40 CFR 72.2).

c. The Permittee shall comply with the specifications and test procedures for CO_2 CEMS at 40 CFR 75.13 and related requirements in Appendices A, B and G of 40 CFR Part 75.

3. Combustion Turbine Work Practice and Operational Requirements

a. The Permittee shall determine the gross calorific value of the fuel monthly using the procedures contained in 40 CFR Part 75, Appendix F, § 5.5.2, and shall maintain records of the monthly fuel gross calorific value for a period of five years. Upon request by EPA, the Permittee shall provide a sample and/or analysis of the fuel fired in the CT's, or shall allow a sample to be taken by EPA for analysis.

b. The Permittee shall install, maintain and operate an elapsed flow meter, to measure the flow rate of the fuel combusted in emission units EP01-EP05.

c. The Permittee shall measure and record the gross energy output (MWh(gross)) on an hourly basis.

C. REQUIREMENTS FOR AUXILIARY COMBUSTION EQUIPMENT

1. The Permittee shall install, maintain and operate a non-resettable elapsed time meter for the Diesel Emergency/Standby Generator (EP15) and the Diesel Fire Pump Engine (EP16). Compliance with the hours of operation limitations, fuel grade limitation, and brake-horsepower limitations, listed in Condition III.A., Table 1, for Units EP15 and EP16 shall constitute compliance with the tpy CO_{2e} emission limitations also listed in Condition III.A., Table 1 for these units.

2. The Permittee shall maintain a file of all records, data measurements, reports and documents related to the operation of the diesel fired engines, EP15 and EP16, as necessary to show compliance with the limitations in Condition III.A. This may include, but is not limited to, the following: all records or reports pertaining to maintenance performed; hours of operation; and, for each diesel fuel oil delivery, documents from the fuel supplier certifying compliance with the limitation to burn diesel fuel in Condition III.A., recorded in a permanent form suitable for inspection. The Permittee must retain the records for not less than five years following the date of such measurements, maintenance, reports, and/or records.

D. FUGITIVE EMISSION SOURCES

1. Fugitive Emission Sources Emission Limits

At all times the Permittee shall not discharge from the source, or cause the discharge, of fugitive emissions from each unit into the atmosphere in excess of the following:

Table 2: Fugitive Emission Sources Emission Limits

Unit ID. No.	Unit Description	GHG Pollutants (Mass Basis)		GHG CO_{2e}
		Pollutant	TPY	TPY
NG-FUG	Fugitive natural gas emissions from valves, flanges and on site compressor	CH_4	16	336
SF_6-FUG1 through SF_6-FUG9	9 SF_6 circuit breakers 60 lbs SF_6 each breaker 1% SF_6 leak rate or better With leak detection	SF_6	0.0027 (5.4 lbpy)	64.5

2. Fugitive Emission Sources Work Practice and Operational Requirements

a. For CH_4 emissions from sources NG-FUG, emissions shall be calculated by the Permittee annually (calendar year). Emissions shall be calculated based on the emission factors from Table W-1A of 40 CFR Part 98, Subpart W, Petroleum and Natural Gas Systems.

b. For SF_6 emissions from sources SF_6-FUG1 through SF_6-FUG9, emissions shall be calculated by the Permittee annually (calendar year) in accordance with the mass balance approach provided in equation DD-1 of the Mandatory Greenhouse Gas Reporting Rule for Electrical Transmission and Distribution Equipment Use, 40 CFR Part 98, Subpart DD.

c. The Permittee shall maintain a file of all records, data measurements, reports and documents related to the fugitive emissions sources (NG-FUG and SF_6-FUG1 through SF_6-FUG9) including, but not limited to, the following: all records or reports pertaining to maintenance performed, equipment replacement, and all records relating to compliance with the Monitoring and Quality Assurance and Quality Control (QA/QC) procedures outlined in 40 CFR 98.304.

IV. RECORDKEEPING REQUIREMENTS

A. In addition to any recordkeeping requirements specified elsewhere in this permit, the Permittee shall maintain a record of all data, measurements, calculations, reports, and documents related to the operation of any systems or devices that could affect the ability of the Permittee to comply with the limitations in Condition III.A., Table 1., including, but not limited to, the following: all records or reports pertaining to significant maintenance performed on any such systems or devices, recorded in a permanent form suitable for inspection. The records must be retained for not less than five years following the date of such measurements, maintenance, reports, and/or records.

B. The Permittee shall maintain the following records for at least five years, including:

1. The occurrence and duration of any startup, shutdown, malfunction;
2. Stack testing (including stack test results, and stack test reports) conducted under Condition V.A.;
3. CEMS emission measurements if the CEMS compliance option under 40 CFR 75.10(a)(3)(i) is used;
4. CEMS testing, maintenance, and calibration checks conducted to satisfy quality assurance requirements if the CEMS compliance option under 40 CFR 75.10(a)(3)(i) is used;
5. The time and duration of any periods that monitoring devices are not operating; and
6. Any emission data required by this permit.

C. The Permittee shall maintain records of all GHG emission units and CO_2 emission CEMS certification tests and monitoring and compliance information required by this permit.

D. 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 Administrator of authorized representative, 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 or fire pump.

E. 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.

F. 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.

G. All records required by this PSD Permit shall be retained for not less than five years following the date of such measurements, maintenance, and reports.

V. STACK TESTING AND FUEL SAMPLING REQUIREMENTS

A. The Permittee shall conduct stack tests to establish the actual quantities of CO_2 being emitted into the atmosphere from one of the simple cycle CT's and from one of the combined cycle CT's. The testing shall be conducted by the deadline specified in Condition III.B.2.b. Sampling shall be conducted in accordance with 40 CFR 60.8 and EPA Methods 3A or 3B for CO_2 concentration, Method 2, 2F or 2G (for stack gas volumetric flow rate), and Method 4 (for stack gas moisture content, if needed).

The stack test shall consist of three separate runs. Each CO_2 test run shall be at least one hour in duration. Stack gas flow rate measurements, as well as moisture measurements (if needed), shall be made during each test run. The gross electrical load (megawatts) during each test run shall be recorded. The CO_2 emission rate shall be calculated and recorded for each test run in lb CO_2/MWh(gross). The arithmetic mean for the three test runs shall also be calculated and recorded. The Permittee shall submit a stack test report within 60 days of completion of testing.

B. The Permittee shall submit a stack test protocol to EPA no later than 30 days prior to the test to allow review of the test plan and to arrange for an observer to be present at the test. The stack test shall be conducted by the Permittee in accordance with the submitted protocol, and any changes required by EPA.

C. Fuel sampling for emission units EP01-EP05 shall be conducted by the Permittee in accordance with 40 CFR Part 75 and Part 98.

D. Each CT tested by the Permittee shall be at or above 90% of maximum load operations. Tested turbine load shall be identified by the Permittee in the stack test report.

E. The Permittee shall conduct stack tests under conditions that are representative of normal operation of the affected facility. The Permittee shall make available to the EPA such records as may be necessary to determine the conditions of the stack tests.

F. The Permittee shall provide the EPA at least 30 days prior notice of any stack test, to afford the EPA the opportunity to have an observer present. If there is a delay in the original test date, the Permittee must provide at least 7 days prior notice of the rescheduled date of the stack test unless unavoidable circumstances (e.g. inclement weather, plant outage) result in cancellation of the test.

G. The Permittee shall provide, or cause to be provided, stack testing facilities as follows:

1. Sampling ports adequate for test methods applicable to this facility;
2. Safe sampling platform(s);
3. Safe access to sampling platform(s); and
4. Utilities for sampling and testing equipment.

VI. AGENCY NOTIFICATIONS

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

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

Authorized By: United States Environmental Protection Agency, Region 8

Howard M. Cantor, for
Assistant Regional Administrator
Office of Partnerships and Regulatory Assistance

Date: 9/27/12