

***Application for a Permit to Construct a
Combined Heat and Power (CHP) Plant***

***Prepared for
Great River Energy - Spiritwood Station
Spiritwood, North Dakota***

***July, 2007
(Revision No. 4)***



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List of Acronyms

AAQS	Ambient Air Quality Standards
ACA	Air Compliance Advisor
ACGIH	American Conference of Governmental Industrial Hygienists
AEFLGR	Amine-Enhanced Fuel-Lean Gas Reburning
AGR	Advanced Gas Reburning
APC	Air Pollution Control
AQCS	Air Quality Control System
As	Arsenic
BACT	Best Available Control Technology
Be	Beryllium
BMP	Best Management Practices
BOOS	Burners Out of Service
BOPF	Basic Oxygen Process Furnace
Btu	British Thermal Unit
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CAM	Compliance Assurance Monitoring
CAMR	Clean Air Mercury Rule
Cd	Cadmium
CEMS	Continuous Emissions Monitoring System
CFB	Circulating Fluidized-Bed
CFR	Section 1.4 - 1st paragraph
CHP	Combined Heat and Power
CI	Compression Ignition
CISWI	Commercial Industrial Solid Waste Incinerator
CMS	Continuous Monitoring System
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
COMS	Continuous Opacity Monitoring System
Cr	Chromium
DA	Deaeration
ECO	Electro Catalytic Oxidation
EFGR	External Flue Gas Recirculation
EGC	Emergency Generator Classification
EPA	Environmental Protection Agency

<u>List of Acronyms</u>	
ESP	Electrostatic Precipitators
EUI	Emission Unit ID
FGD	Flue Gas Desulfurization
FGR	Flue Gas Recirculation
FLGR	Fuel-Lean Gas Reburning
GEP	Good Engineering Practice
GWh	Gigawatt Hours
H2H	High-2nd-High
HAP	Hazardous Air Pollutant
HCl	Hydrogen Chloride
Hg	Mercury
HHV	Higher Heating Value
HP ST	High Pressure Steam Turbine
HSR	Hybrid-Selective Reduction
HVAC	Heating Ventilation and Air Conditioning
IARC	International Agency for Research on Cancer
ICE	Internal Combustion Engine
ISC-PRIME	Industrial Source Complex-Plume Rise Model Enhancements
kV	Kilovolts
kWh	Kilowatt Hour
LEA	Low Excess Air
LNB	Low NO _x Burners
LoTOx	(Trade name for a NO _x control technology)
LP ST	Low Pressure Steam Turbine
LTO	Low Temperature Oxidation
MAAL	Maximum Acceptable Ambient Levels
MACT	Maximum Achievable Control Technology
MCPU	Miscellaneous Organic Chemical Manufacturing Process Units
MCR	Maximum Continuous Rating
MICR	Maximum Individual Carcinogenic Risk
MMBtu	Million Btu
Mn	Manganese
MSTG	Main Steam Turbine Generator
MSW	Municipal Solid Waste
MWe	Megawatt Electrical
MWh	Mega Watt Hour

<u>List of Acronyms</u>	
NAAQS	National Ambient Air Quality Standards
NDAC	North Dakota Administrative Code
NDDH	North Dakota Department of Health
NESHAP	National Emission Standards for Hazardous Air Pollutants
NFPA	National Fire Protection Association
Ni	Nickel
NIOSH	National Institute for Occupational Safety and Health
NLCD	National Land Cover Data
NO _x	Nitrogen Oxides
NSCR	Non-Selective Catalytic Reduction
NSPS	New Source Performance Standards
NSR	New Source Review
NTP	National Toxicology Program
OCS	Outer Continental Shelf
OFA	Overfire Air
OLD	Organic Liquid Distribution
OSHA	Occupational Safety & Health Administration
OSWI	Other Solid Waste Incinerator
PAC	Powdered Activated Carbon
Pb	Lead
PCWP	Plywood and Composite Wood Products
PM	Particulate Matter
PM ₁₀	Particulate Matter Equal to or Less Than 10 Micrometers in Diameter
POTW	Publicly Owned Treatment Works
PSD	Prevention of Significant Deterioration
PSM	Process Safety Management
PSTG	Peaking Steam Turbine Generator
PTE	Potential-to-Emit
RA	Risk Assessment
RACT	Reasonably Available Control Technology
RBLC	RACT/BACT/LAER Clearinghouse
RICE	Reciprocating Internal Combustion Engine
RMP	Risk Management Program
ROFA	Rotating Opposed Fire Air
RTO	Regenerative Thermal Oxidation
SAM	Sulfuric Acid Mist

<u>List of Acronyms</u>	
SDA	Spray Dryer Absorber
Se	Selenium
SCONOx	(Trade name for a NOx control technology)
SCR	Selective Catalytic Reduction ³ .
SDA	Spray Dryer Absorber
SNCR	Selective Non-Catalytic Reduction
SO ₂	Sulfur dioxide
SOCMI	Synthetic Organic Chemicals Manufacturing Industry
SSM	Startup/Shutdown/Malfunction
SSMP	Startup/Shutdown/Malfunction Plan
TDS	Total Dissolved Solids
TLV-C	Threshold Limit Value-Ceiling
TLV-STEL	Threshold Limit Value-Short Term Exposure Limit
TLV-TWA	Threshold Limit Value-Time Weighted Average
Tpy	Tons per Year
UBH	Unburned Hydrocarbons
ug/g	micrograms per gram
ULNB	Ultra Low NO _x Burners
USEPA	United States Environmental Protection Agency
VHAP	Volatile Hazardous Air Pollutant
VISCREEN	EPA's Visible Screening Model
VOC	Volatile Organic Compounds
WESP	Wet Electrostatic Precipitators
Wt % S	Weight percent sulfur

1.0 Introduction

Great River Energy (GRE) proposes to construct Spiritwood Station a lignite-fired combined heat and power (CHP) plant near Spiritwood, Stutsman County, North Dakota. This application requests permission to construct and operate the new CHP plant on Cargill Malt America's existing plant property. The Spiritwood Station CHP plant is expected to provide process-heating steam to both Cargill Malt America's plant and Spirit Ethanol's proposed ethanol plant. Together, these three facilities comprise the "Spiritwood Industrial Park."

The electricity generated from Spiritwood Station will be sent to a nearby electrical substation from which it will be transmitted as wholesale electricity to the electrical grid. The CHP plant boiler will be coupled to a steam turbine generator that will produce approximately 99 megawatts electrical (MWe) net output for delivery to the grid at 115 kilovolts (kV).

1.1 Project Description

Spiritwood Station's lignite-fired CHP facility will include a circulating fluidized-bed (CFB) boiler with the following emissions control technologies:

- Limestone addition to the CFB bed for primary sulfur dioxide (SO₂) control, and a spray dryer absorber (SDA) for secondary SO₂ control;
- Ammonia injection system for nitrogen oxides (NO_x) control (selective non-catalytic reduction or SNCR);
- Powdered activated carbon (PAC) injection system for mercury control; and
- Baghouse system for primary particulate matter (PM) control and to capture the SDA solids and PAC.

The CFB boiler will be fired with beneficiated (dried) lignite coal as the primary fuel, but it could also be fired with raw lignite or subbituminous coal. Spiritwood Station will receive crushed coal by railcar. The coal receiving area will be enclosed and vented to a baghouse to collect particulate matter generated during receiving operations. The coal will be stored in a silo.

Basic coal quality specifications for the coal types requested to be permitted for Spiritwood Station are provided below.¹

Table 1.1 Spiritwood Station – Basic Coal Characteristics

Dried Lignite			
	Annual Average		Estimated 24-hr/30-day Average
Parameter	Mean	Std Deviation	Mean +3 Std Dev
Sulfur	0.79	0.09	1.06
Ash	13.38	1.09	16.65
Moisture	25.81	1.92	31.57
Btu/lb	7500	138	7914
Raw Lignite			
	Annual Average		Estimated 24-hr/30-day Average
Parameter	Mean	Std Deviation	Mean +3 Std Dev
Sulfur	0.61	0.06	0.79
Ash	11.91	1.08	15.15
Moisture	36.4	0.68	38.44
Btu/lb	6254	107	6575
PRB Subbituminous			
	Annual Average		Estimated 24-hr/30-day Average
Parameter	Mean	Std Deviation	Mean +3 Std Dev
Sulfur	0.34	0.07	0.55
Ash	4.12	0.33	5.11
Moisture	25.4	0.56	27.08
Btu/lb	9338	103	9647

¹ Fuel characteristics are indicative of expected means and ranges. SO₂ emission calculations later in this application are conservatively based on 1.13% sulfur, which was determined from an early data set as a likely maximum fuel sulfur content.

The CFB boiler feed will consist of crushed coal with limestone injection to achieve an appropriate calcium to sulfur ratio for SO₂ control. Milled limestone will be delivered by truck and transferred pneumatically to a storage silo. Air will be blown into the boiler from beneath a sand and ash bed partially suspending the fuel to create a “fluidized” layer of burning coal.

Fluidized combustion occurs at lower temperatures, resulting in lower NO_x emissions than conventional pulverized coal boilers. Conventional coal boilers typically operate at temperatures ranging from 2,200 °F to 2,400 °F, while Spiritwood Station’s CFB boiler will operate at bed temperatures ranging from approximately 1,550 °F to 1,750 °F.

The heat given off in combustion will be used to create steam, which will drive a turbine generator to generate electricity. The STG will have a maximum rated net capacity of approximately 99 MWe that can be generated during peak-power demand periods. Normally, the steam turbine generator (STG) will operate at approximately 56 MWe net while supplying a low-pressure process steam supply to the malt and ethanol plants. The STG will operate at higher than 56 MWe net under two conditions:

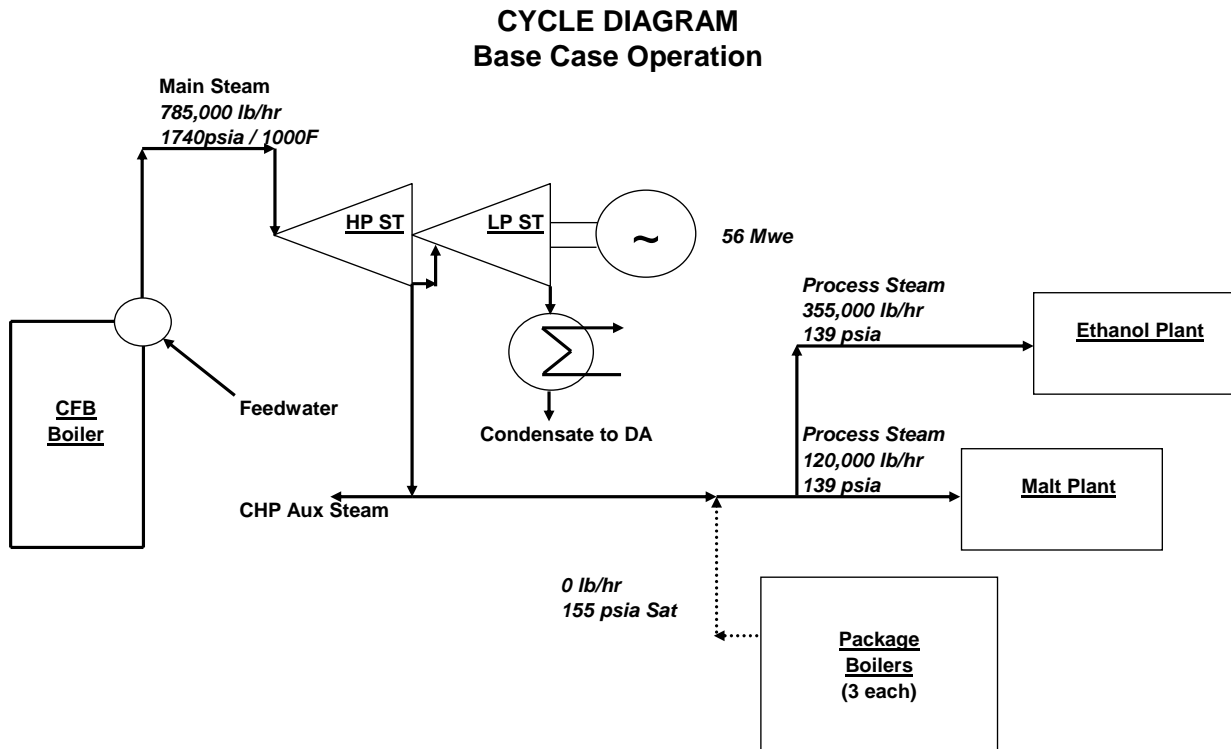
1. When steam demand from Cargill Malt and Spirit Ethanol are not at their design peak.
2. When the peaking boiler is operated to supply steam to Cargill Malt and Spirit Ethanol.

If Cargill Malt and Spirit Ethanol’s steam demand is not at its design peak, some low pressure steam exiting the high pressure steam turbine (HPST) can be used to drive the low pressure steam turbine (LPST) for additional power generation.

When demand for electricity is high, the plant can operate in the “peaking” mode by directing all of the steam off the HPST to the LPST enabling the generator to produce a net 99 MWe. When the power plant is in peaking mode, steam requirements for the ethanol and malt plants will be supplied by three onsite package boilers. The electricity generated will be sent to the existing Ladish substation and then along transmission lines to the electrical grid for sale.

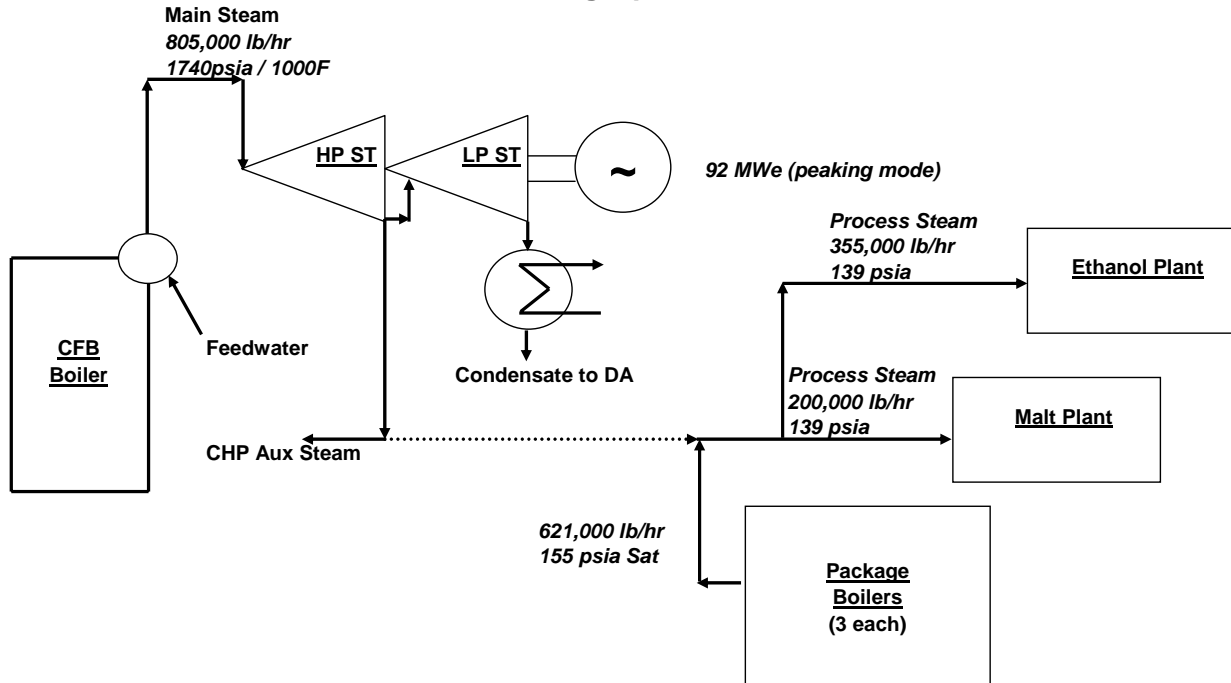
The two-generation bounding scenarios are illustrated in the following figures. Base case operation, represents the planned typical operation in which the CFB boiler is providing power generation steam to the STG and low pressure steam exiting the HPST supplies the process steam demand for the ethanol and malt facilities. The base case assumes all facilities are operating at their peak design rates, in which case the LPST does not operate. As already explained, the LPST could operate under

a non-bounding scenario if the steam demand from the ethanol and malt facilities is less than their peak demand.



The design case, which is also referred to herein as the peaking case, represents a maximum load operation in which the CFB boiler generates steam to drive the HPST. Low-pressure steam exiting the HPST drives the LPST. During the peaking mode (HPST and LPST operation), the package boilers are operating to provide process steam for the ethanol and malt facilities.

CYCLE DIAGRAM Peaking Operation



The flue gas exiting the CFB boiler will be injected with ammonia (i.e. SNCR), reducing nitrogen oxides further. A powdered activated carbon (PAC) injection system will be used to reduce mercury emissions before the gas stream reaches the SDA. Mercury in the gas stream adsorbs to the activated carbon particles, which are subsequently removed by the fabric filter. The SDA will inject an atomized lime slurry solution into the flue gas stream prior to the baghouse to react with acid gases such as SO₂ and HCl. The hot flue gas dries the slurry particles, which can then be filtered out along with the fly ash and PAC. The lime will be supplied by truck, and mixed with water to form the slurry.

The CHP plant will include an ash handling system to manage bed solids from the CFB Boiler and fly ash removed from the flue gas. A bottom ash handling system will transfer the bottom ash from the CFB boiler to either an ash silo for disposal or a bed material silo for reuse. Fly ash will deposit in the air heater hopper, SDA hopper, and CFB boiler baghouse hopper. A pneumatic conveying system will transfer the fly ash to the ash silo. Ash solids stored in the silo will be transferred to covered trucks for transport to offsite disposal.

Three package boilers firing natural gas, propane, or distillate fuel oil will provide for steam needs at the ethanol and malt plants until the CFB boiler begins operation. Once the CFB is operational, the package boilers will serve to provide supplementary or auxiliary steam production on an as-needed basis when the CFB boiler is at low-load conditions or is shutdown, or when the LPST is operating in peaking power production mode. The package boilers' heat input capacity is fuel dependent and is expected to be 253 MMBtu/hr while firing natural gas, 250 MMBtu/hr while firing fuel oil and 246 MMBtu/hr while firing propane. These ratings were increased by 10% in the emission inventory to provide a safety factor for dispersion modeling purposes.

Spiritwood Station will be a major source with respect to New Source Review (NSR) Prevention of Significant Deterioration (PSD) requirements based on its potential to emit. This application includes the requisite Best Available Control Analyses (BACT) and proposes BACT emissions limits. The facility is also subject to several New Source Performance Standards (NSPS). Due to the different forms of emission limits (lb/MMBtu vs. lb/MWh) between the PSD BACT limits and the NSPS limits, there are instances where both BACT and NSPS will be tracked to demonstrate compliance. Because the CFB boiler cannot operate at optimal levels below 772 MMBtu/hr, Spiritwood is proposing alternate BACT emissions limits below this heat input rate for NO_x and CO. Furthermore, the application includes a request for startup/shutdown provisions for NO_x where the CFB BACT limit does not apply.

1.2 Efficiency Aspects of the Project

Energy efficiency in power production is measured in terms of heat rate. The heat rate is the amount of energy (Btu) in the fuel needed to produce one kilowatt-hour (kWh) of electricity. As heat rate decreases, power plant energy efficiency increases. Plants that use a steam cycle such as coal tend to have heat rates of around 10,000 Btu/kWh², which corresponds to an efficiency of about 34%. Much of the loss in efficiency occurs in the process of condensing spent steam exiting the power generation turbine. The heat of condensation, carried by cooling water, is released to the atmosphere as waste heat when cooling water is cooled by the cooling tower.

The Spiritwood Station project is a combined heat (steam) and power design (CHP), which will achieve significantly higher overall fuel to energy efficiency than a conventional power plant. The Spiritwood project will provide spent steam to two nearby industrial facilities, Spirit Ethanol and

² Nuclear Energy Institute, definition of "energy efficiency", <http://www.nei.org/index.asp?catnum=2&catid=262>

Cargill Malt, as process steam. The industrial facilities subsequently send steam condensate back to the power plant for return to the boiler system as feedwater. As a result, Spiritwood Station will release much less waste heat.

In addition to the industrial partnership to utilize power plant steam, the primary fuel for the Spiritwood Station project will be dried lignite. Dried lignite will be prepared at or near Great River Energy's Coal Creek Station that uses power plant waste heat to remove about 13% of the moisture in the coal. Firing a lower-moisture coal preserves coal energy for power production versus expending energy for the vaporization of water that is then lost through the stack gases. Firing less coal to produce the same energy is more efficient and results in lower air emissions per unit of energy generated.

Using dried lignite as the primary fuel and using spent steam to heat industrial processes result in expected energy efficiency on the order of 65 to 70% for the Spiritwood project base case.

1.3 Facility Emission Unit Summary

The main process units that will generate air emissions include coal unloading and conveying, lime and limestone unloading, ash handling, and fuel combustion. The emission control devices to be used at the facility are summarized below:

- Particulate emissions from coal unloading and conveying, lime and limestone unloading, and ash handling are controlled by baghouses. All storage silos associated with pneumatic conveying include bin vents with fabric filters.
- Particulate emissions from the CFB boiler are controlled by a baghouse.
- SO₂ emissions will be primarily controlled by limestone addition to the CFB boiler. Secondary SO₂ emissions reduction will be accomplished by the spray dryer absorber (SDA) system.
- NO_x emissions will be inherently controlled by the CFB boiler's relatively lower combustion temperatures. Ammonia will be injected into the flue gas by the SNCR system to further reduce NO_x emissions.
- Mercury emissions will be controllable with the activated carbon injection system. However, it is expected that burning beneficiated lignite will allow the facility to comply with all applicable mercury limits without the use of the PAC system. The PAC system will be operated based on the economics of controlling versus purchasing requisite mercury emission allowances. When the PAC system is operated, mercury in the flue gas will adsorb onto the surface of the PAC, which is removed by the fabric filter.

Table 1-2 summarizes the emission units to be permitted at the Spiritwood Station facility. The plant will include various support activities that can contribute insignificant emissions, including roadway dust, maintenance activities, HVAC equipment and minor laboratory procedures. The generator room will also include an oil/water separator that will only be used in the event of a spill that reaches the floor drains.

Table 1-2 Summary of Emission Units

Emission Unit ID (EUI)	Emission Unit Description	Emission Point (EPN)
1	Main Stack – CFB Boiler / Start-up Burners	001
2	Coal Unloading	002
3	Coal Silo	003
4	Coal Silo Discharge	004
5	Coal Bunker	005
6	Limestone Unloading / Limestone Silo	006
7	Lime Unloading / Lime Silo	007
8	Bed Material Silo	008
9	Recycle Ash Silo	009
10	Ash Silo	010
11	Ash Loadout	011
-	Reserved	012
-	Reserved	013
12	Package Boiler 1	014
13	Package Boiler 2	014
14	Package Boiler 3	014
15	Diesel Fire Water Pump	015
16	Cooling Tower	016
17	Propane Vaporizer	017
18	Diesel Generator	018
IA	Paved Road Emissions	Fug
IA	Equipment Leaks	Fug
19	Package Boiler Fuel Oil Tank (500,000 gal)	Tank
20	Fire Pump Diesel Storage Tank (500 gal)	Tank
21	Emergency Generator Diesel Tank (500 gal)	Tank
22	Railcar Heaters	002
ISA	Building HVAC (Natural Gas-Fired Units)	NA

1.4 Air Emissions Inventory

The components of the Spiritwood Station project are proven technology that have been permitted and are in operation at other locations around the country. The air emission inventory accounts for the main CFB boiler and the ancillary systems that correspond with a 99-MWe net CHP plant such as coal and ash handling, (auxiliary) package boilers, cooling tower and diesel engine emissions. The

Spiritwood Station project will have the potential to emit PM/PM₁₀, NO_x, SO₂, and CO, in excess of the 100-ton threshold for listed major sources subject to New Source Review under 40 CFR 52.21. The project is also a major source of Hazardous Air Pollutant (HAP) emissions. HAP emissions are summarized in Table C-3 of Appendix C.

The controlled emissions for the project are summarized in Table 1-2. The emissions represented in the inventory result in modeled concentrations that are less than the allowable PSD Class II increments.

For air permitting purposes, the CFB boiler heat input is adjusted upward by 10% to provide a safety factor for the analyses that support this application. The uncontrolled emission rates used by the emissions inventory are based primarily on EPA emission factors (“AP-42”) or design information. Best Available Control Technology (BACT) and Maximum Achievable Control Technology (MACT)-determined limits are used primarily to calculate limited emissions. The calculations reflect Spiritwood Station’s best effort to estimate the potential impact of the project on the environment and the inventory is the basis for subsequent dispersion modeling, BACT review, and additional risk assessments.

Table 1-3. Summary of Controlled Potential to Emit

EPN #	Emission Unit ID	Source Description	PM tons/year	PM10 tons/year	SO2 tons/year	NOx tons/year	VOC tons/year	CO tons/year
001	EUI 001	Main Stack - CFB Boiler / Start-up Burners	84.0	168.0	336.1	504.1	39.2	840.1
002	EUI 002	Coal Unloading	18.0	18.0				
003	EUI 003	Coal Silo	1.6	1.6				
004	EUI 004	Coal Silo Discharge	0.4	0.4				
005	EUI 005	Coal Bunker	0.9	0.9				
006	EUI 006	Limestone Unloading / Limestone Silo	0.7	0.7				
007	EUI 007	Lime Unloading / Lime Silo	0.8	0.8				
008	EUI 008	Bed Material Silo	0.5	0.5				
009	EUI 009	Recycle Ash Silo	0.3	0.3				
010	EUI 010	Ash Silo	0.6	0.6				
011	EUI 011	Ash Loadout	0.2	0.2				
012		Reserved						
013		Reserved						
014	EUI 012	Package Boiler 1	35.4	35.4	60.2	153.5	6.2	98.5
014	EUI 013	Package Boiler 2	35.4	35.4	60.2	153.5	6.2	98.5
014	EUI 014	Package Boiler 3	35.4	35.4	60.2	153.5	6.2	98.5
015	EUI 015	Diesel Fire Water Pump	0.2	0.2	0.2	2.7		0.6
016	EUI 016	Cooling Tower	5.3	5.3				
017	EUI 017	Propane Vaporizer	0.4	0.4	1.3	2.6		5.1
018	EUI 018	Diesel Generator	0.2	0.2	0.1	8.4		1.9
002	EUI 022	Rail Car NG/Propane Heaters	0.5	0.5	1.2	11.4	0.3	5.0
N/A	IA	Space Heaters (12 Combined) - NG Fired	0.02	0.02	0.001	0.46	0.01	0.20
Fugitive Emissions								
Fugitives	IA	Paved Road Emissions	0.03	0.003				
	IA	Equipment Leaks					1.0	
Tank Emissions								
Tanks	EUI 19	Package Boiler Fuel Oil Tank (500,000 gal)					0.14	
	EUI 20	Fire Pump Diesel Storage Tank (500 gal)					4.0E-05	
	EUI 21	Emerg. Generator Diesel Tank (500 gal)					6.5E-05	
TOTAL			220.9	304.9	519.5	990.1	59.2	1,148.5

In some cases, the only emission factor available to characterize specific process or pollutant emissions was a controlled factor. An assumption regarding control efficiency was applied in these cases to calculate an uncontrolled emission rate. The controlled emission rates reflect the control technology,

BACT or otherwise, that Spiritwood Station proposes to include as part of the project design.

In the case of metallic HAP emissions from the CFB, an assumption can be made that particulate control by the fabric filter provides a surrogate indicator of control for metallic HAPs. The emission inventory uses AP-42 emission factors to estimate HAP emissions from lignite combustion and these factors originate from tests of controlled boiler units. AP-42 acknowledges that a variety of coals, boiler configurations and control equipment trains are represented by the data. The emission inventory calculations do not apply any additional control efficiency to develop the HAP emission estimates. Given that the test data supporting the AP-42 factors is dated, it is likely that using these controlled factors still results in a conservatively high HAP emissions estimate. The proposed BACT limits for CFB particulate emissions are expected to result in metal HAP emission rates that are lower than those represented by the emission inventory.

1.5 Air Quality Regulatory Overview

This section summarizes the primary applicable air quality regulations for the Spiritwood Station facility. See Section 2.0 of this application for a comprehensive air quality regulatory applicability analysis and Section 3.0 for compliance approach.

For purposes of defining the stationary source in this permit application, the Spiritwood Station facility is only the CHP plant and its corresponding emission units as summarized in Table 1-1. Pursuant to NDDH correspondence³, the existing Cargill Malt plant and proposed Spirit Ethanol plant are separate stationary sources from the Spiritwood Station facility for the purpose of regulatory applicability under several air quality programs, including Prevention of Significant Deterioration (PSD) review, air toxics standards under Section 112 of the Clean Air Act (CAA), and Title V (Part 70) operating permits.

The Spiritwood Station facility will be a major source with respect to PSD review, section 112 of the CAA, and Title V permitting.

The CFB boiler will be subject to the Standards of Performance for New Stationary Sources (NSPS) Subpart Da for electric utility steam generating units. The CFB boiler is also subject to the requirements of 40 CFR 60 Subpart HHHH for mercury budget units. The auxiliary package boilers will be subject to 40 CFR 60 Subpart Db for industrial steam generating units.

³ September 7, 2006 letter to Ms. Mary Jo Roth of Great River Energy from Mr. Terry O'Clair of NDDH.

The coal conveying equipment, coal storage systems, and coal transfer and loading systems will be subject to NSPS Subpart Y for coal preparation plants.

The diesel and fuel oil storage tanks are exempt from NSPS Subpart Kb for volatile organic liquid storage tanks because the vapor pressure for fuel oil is below the threshold vapor pressure of 3.5 kilopascals (0.5 psi) in the standard. The vapor pressure for fuel oil at 100°F is 0.022 psi. The EPA TANKS program indicates the maximum surface temperature of the 500,000-gallon tank would be 507 degrees Rankin (47 degrees Fahrenheit), which would result in a vapor pressure of 0.0042 psia (0.03 kPa).

The diesel engines driving the fire water pump and the standby generator are subject to 40 CFR 60 Subpart IIII for Stationary Compression Ignition Internal Combustion Engines.

Spiritwood Station will be a major source of HAPs and therefore subject to the applicable provisions within 40 CFR Part 63, including:

- Subpart Q: National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers
- Subpart ZZZZ: National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines; and
- Subpart DDDDD: National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters. (Package boilers only)

1.6 Project Schedule

As of the date of this permit application, the Spiritwood Station project schedule includes the following milestones:

- Obtain environmental permits and approvals; begin construction – July 15, 2007
- Package boilers startup – August 2008 (first fire)
- CFB boiler startup – December 2009 (first fire)
- CFB commercial operation – March 2010

2.0 Regulatory Applicability

Spiritwood Station has completed an applicability review of Federal and State air quality regulations as part of the air permit application process. Table 2-1 provides a summary of the major air quality programs that were reviewed and each regulation is described in the following sections. A comprehensive list of all air quality regulations, with a brief statement of applicability, is provided in Appendix B. Please refer to Section 3.0 for compliance demonstration with applicable requirements.

Table 2-1. Summary of Air Quality Regulatory Applicability			
Report Section	Program Description	Regulatory Citation	Applicable
2.1	New Source Review (NSR)	40 CFR 52	YES
2.2	National Ambient Air Quality Standards (NAAQS)	40 CFR 50	YES
2.3	New Source Performance Standards (NSPS)	40 CFR 60 Subparts A, Da, Db, Y and HHHH, IIII	YES
2.4	National Emission Standards for Hazardous Air Pollutants (NESHAPs)	40 CFR 61 40 CFR 63 Subparts A, Q, ZZZZ, and DDDDD	NO YES
2.5	Risk Management Programs for Chemical Accidental Release Prevention	40 CFR 68	NO
2.6	Title V Operating Permit	40 CFR 70	YES
2.7	Compliance Assurance Monitoring	40 CFR 64	YES
2.8	Acid Rain Requirements	40 CFR 72	YES
2.9	Stratospheric Ozone Protection Requirements	40 CFR 82	YES
2.10	North Dakota State Rules	NDAC 33-15	
2.10.1	General Provisions	33-15-01	YES
2.10.2	Ambient Air Quality Standards	33-15-02	YES
2.10.3	Restriction of Emission of Visible Air Contaminants	33-15-03	YES
2.10.4	Emissions of Particulate Matter Restricted	33-15-05	YES
2.10.5	Emissions of Sulfur Compounds Restricted	33-15-06	NO
2.10.6	Control of Organic Compounds Emissions	33-15-07	YES
2.10.7	Control of Air Pollution From Vehicles and Other Internal Combustion Engines	33-15-08	YES
2.10.8	Prevention of Air Pollution Emergency Episodes	33-15-11	YES
2.10.9	Standards of Performance for New Stationary Sources	33-15-12	YES
2.10.10	Emission Standards for Hazardous Air Pollutants	33-15-13	YES
2.10.11	Designated Air Contaminant Sources, Permit to Construct, Minor Source Permit to Operate, Title V Permit to Operate	33-15-14	YES
2.10.12	Prevention of Significant Deterioration of Air Quality	33-15-15	YES

2.10.13	Restriction of Odorous Air Contaminants	33-15-16	YES
2.10.14	Restriction of Fugitive Emissions	33-15-17	YES
2.10.15	Stack Heights	33-15-18	YES
2.10.16	Visibility Protection	33-15-19	YES
2.10.17	Acid Rain Program	33-15-21	YES
2.10.18	Emissions Standards for HAP for Source Categories	33-15-22	YES
2.10.19	Fees	33-15-23	YES

2.1 New Source Review (NSR)/Prevention of Significant Deterioration (PSD)

Stutsman County in North Dakota is an unclassifiable/attainment area for sulfur dioxide, carbon monoxide, ozone, fine particulate matter, and nitrogen dioxide.⁴ New sources of emissions located in an attainment area must be reviewed for applicability under the Prevention of Significant Deterioration (PSD) program. North Dakota has a federally-approved PSD program under NDAC 33-15-15 for sources proposing to construct on areas other than Indian Reservations.⁵ See Section 2.10.12 for a summary of the PSD applicability analysis.

2.2 National Ambient Air Quality Standards (NAAQS)

Primary NAAQS define levels of air quality that the United States Environmental Protection Agency (USEPA) deems necessary to protect the public health. Secondary NAAQS define levels of air quality that the USEPA judges necessary to protect the public welfare (i.e. wildlife, national monuments, vegetation, visibility, and property values) from any known, or anticipated adverse effects of a pollutant.

As part of the PSD analysis, major sources of air pollution are required to demonstrate compliance with the NAAQS by completing refined air dispersion modeling. The modeling and its results are discussed in Section 2.10.12.

⁴ 40 CFR 81.335.

⁵ 40 CFR 52.1829(a).

2.3 New Source Performance Standards (NSPS)

An NSPS is applicable to certain categories of affected facilities that are constructed, modified, or reconstructed and that meet other applicability criteria on or after a compliance date upon which a relevant subpart applies. Spiritwood Station will be subject to the following NSPS:

- Subpart Da for electric utility steam generating units (CFB Boiler). See Section 2.3.1.
- Subpart Db for industrial, commercial and institutional steam generating units (3 package boilers). See Section 2.3.2.
- Subpart Y for coal preparation plants. See Section 2.3.3.
- Subpart HHHH, which contains the mercury emissions provisions for coal-fired electric steam generating units (CFB Boiler). See Section 2.3.4.
- Subpart IIII, which applies to stationary Compression Ignition (CI) Internal Combustion Engines (ICE), is applicable to the emergency generator, and fire water pump. See Section 2.3.5.

The Spiritwood Station project is not subject to the following NSPS:

- Subpart Kb for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984 because the subpart does not apply to tanks that store a liquid (distillate oil) with a vapor pressure below 3.5 kPa (0.5 psi). The vapor pressure for fuel oil at 100°F is 0.022 psi. The EPA TANKS program indicates the maximum surface temperature of the 500,000-gallon tank would be 507 degrees Rankin (47 degrees Fahrenheit), which would result in a vapor pressure of 0.0042 psia (0.03 kPa).
- Subpart OOO for non-metallic mineral processing plants because Spiritwood Station will not be processing limestone on site. Crushed limestone will be delivered to the plant in the form that can be used in the CFB boiler.

2.3.1 Subpart Da – Standards of Performance for Electric Utility Steam Generating Units for Which Construction is Commenced After September 18, 1978

Spiritwood Station will install a new coal-fired boiler subject to NSPS Subpart Da. The emission limits options under Subpart Da for new electric utility steam generating units applicable to the proposed CFB boiler are:

- Particulate:
 - 18 ng/J (0.14 lb/MWh) gross energy output; or

- 6.4 ng/J (0.015 lb/MMBtu) heat input,
- Or the alternative particulate compliance combination of:
 - 13 ng/J (0.03 lb/MMBtu) heat input derived from the combustion of solid, liquid, or gaseous fuel, and
 - 0.1 percent of the combustion concentration determined according to the procedure in §60.48Da(o)(5) (99.9 percent reduction), or
 - 0.2 percent of the combustion concentration determined according to the procedure in §60.48Da(o)(5) (99.8 percent reduction)
- SO₂ emission limit of 180 ng/J (1.4 lb/MWh) gross energy output, regardless of fuel being burned (one exception applies to units that burn over 90% coal refuse). This corresponds to a limit of 0.13 – 0.27 lb/MMBtu SO₂ depending on the steam cycle scenario.
- NO_x emission limit of 130 ng/J (1.0 lb/MWh) gross energy output, regardless of fuel being burned. This corresponds to a limit of 0.2 – 0.09 lb/MMBtu NO_x depending on the steam cycle scenario.
- Mercury emission limit of 0.175 lb/GWh for lignite-fired power generation. This corresponds to mercury in fuel content of 0.12 – 0.25 ug Hg/g coal depending on the steam cycle scenario. The primary fuel analysis indicates a dried lignite mercury content of 0.093 ug/g. The mercury emission limit while firing subbituminous fuel is 0.066 lb/GWh.

In determining the output-based emission limit for SO₂ for combined heat and power applications, energy output is the sum of the gross electrical output and the useful energy of the process steam, with useful energy of the process steam calculated as 75% of the thermal output.

Compliance with the NSPS limits will be determined by using the same testing, monitoring and other compliance provisions that existed prior to recent amendments made to the rule. New utility steam generating units must demonstrate compliance with NSPS emission standards upon commercial start-up and are required to have continuous emission monitoring systems.

2.3.1.1 Mercury

As previously acknowledged, Spiritwood Station is subject to the emission limits under 40 CFR Part 60, Subpart Da, including those for mercury emissions. Based on coal analysis information, Spiritwood Station anticipates that no mercury-specific controls will be needed to meet the Subpart Da mercury standard. The Spiritwood Station project design includes a powdered activated carbon (PAC) injection system to specifically control mercury emissions. This added level of mercury control is a proactive and elective measure by Spiritwood Station. The anticipated powdered activated carbon (PAC) injection rate is 47 lb/hr for a removal efficiency of 70%, if needed. The use of PAC injection would be on a voluntary basis because the boiler is expected to meet the NSPS Da mercury limit without control when firing beneficiated lignite; therefore, the PAC injection rate is

not considered to be permit condition. The PAC system will be operated to control mercury emissions whenever it is more cost effective to control rather than to purchase requisite mercury allowances.

2.3.2 Subpart Db – Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units >100 MMBtu/hr

Spiritwood Station will install three, approximately 250 MMBtu/hr, auxiliary package boilers to provide standby process steam generating capacity for the ethanol plant and malt plant operations. These boilers will be primarily gas-fired, with propane and distillate oil firing capability for back-up. The heat input capacities of these boilers are greater than the 100 MMBtu/hr threshold for NSPS Subpart Db applicability; therefore, the boilers are subject to NSPS Subpart Db and will be required to meet NO_x emission limits. A single NO_x CEMS will be installed on the common stack for the three boilers to demonstrate compliance with the applicable standard.

2.3.3 Subpart Y – Standards of Performance for Coal Preparation Plants

The CHP plant will be required to comply with the Subpart Y NSPS requirements for coal preparation plants. The provisions of this subpart are applicable to affected sources that process more than 200 tons of coal per day and use coal processing and conveying equipment (including breakers and crushers), coal storage systems and coal transfer and loading systems. Emissions from these coal-handling sources must exhibit opacity of less than 20%.

2.3.4 Subpart HHHH –Emission Guidelines and Compliance Times for Coal-Fired Electric Steam Generating Units

The USEPA issued the Utility Mercury Reductions Rule, also known as the Clean Air Mercury Rule (CAMR), on March 15, 2005, as an integration into Subpart Da NSPS standards. The USEPA revised the regulatory finding made in December 2000 regarding the utility boiler category under the NESHAPs program (the “Utility MACT”) and instead set standards of performance pursuant to Section 111 of the Clean Air Act (CAA) for mercury from new coal-fired units. The rule-making also initiated a mercury cap-and-trade program for both new and existing coal-fired generating units.

The mercury cap-and-trade program, found at 40 CFR Part 60 Subpart HHHH, is the alternative to setting national emission standards for hazardous air pollutants (NESHAP) for utility boilers pursuant to Section 112 of the CAA. A NESHAP requires affected units to meet hazardous air pollutant (HAP) emissions standards reflecting the application of the maximum achievable control technology (MACT) determined pursuant to the procedures set forth in CAA section 112(d). The proposed Utility MACT was withdrawn in favor of amending NSPS Subpart Da.

Each coal-fired electric utility steam generating unit constructed after January 30, 2004, is required to meet a mercury emissions standard under NSPS Subpart Da. The mercury emission standard for coal-fired steam generating units that fire only lignite is 175×10^{-6} lb/MWh or 0.175 lb/GWh on an output basis and for units that fire only subbituminous coal is 66×10^{-6} lb/MWh. When a cogeneration unit is being used, the emission rates are based on electrical output to the grid plus 75% of the equivalent electrical energy in the unit's process stream.

These emission standards apply at all times except during periods of start-up, shutdown, or malfunction. The mercury emission rate is to be calculated using hourly mercury concentrations measured according to the emission monitoring requirements set forth in section 60.49Da. Compliance with the emissions requirements is determined on a 12-month rolling average basis. Section 60.49Da states that a continuous emissions monitoring system (CEMS) must be installed to measure and record the concentration of mercury in the exhaust gases.

2.3.5 Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

The EPA promulgated Subpart IIII in the Federal Register on July 11, 2006 (71 FR 132, p. 39154-39185). Subpart IIII applies to owners and operators of stationary compression ignition (CI) internal combustion engines (ICE) that commence construction after July 11, 2005 where the stationary CI ICE are either manufactured after April 1, 2006 and are not fire pump engines, or are manufactured as certified National Fire Protection Association (NFPA) fire pump engines after July 1, 2006. The date that construction commences is the date the engine is ordered by the owner or operator. Spiritwood Station is planning to install two stationary compression ignition internal combustion engines as part of the project, namely an emergency generator and a fire pump engine, which will be subject to the standards in Subpart IIII.

For the purposes of applicability, Spiritwood Station assumes that model year 2007 engines will be installed. Compliance with the standards can be attained by purchasing certified engines that meet the applicable requirements for a given model year.

2.4 National Emission Standards for Hazardous Air Pollutants (NESHAPs)

Two NESHAPs programs are promulgated under 40 CFR Parts 61 and 63. The provisions of 40 CFR 61 applies to owners or operators of stationary sources for which a standard is prescribed

under a subpart of Part 61. The Spiritwood facility is not among the affected sources listed in 40 CFR 61.

The provisions of 40 CFR 63 define source categories that emit hazardous air pollutants (HAPs) above Title V source thresholds and provides the HAP emission standards and monitoring requirements.⁶ This part is also referred to as the Maximum Achievable Control Technology (MACT) standards. The major source thresholds are 10 tpy for any single HAP and/or 25 tpy of all combined HAPs. Spiritwood Station will be subject to the following MACT standards under Part 63:

- Subpart Q for cooling towers;
- Subpart ZZZZ for stationary reciprocating internal combustion engines; and
- Subpart DDDDD for industrial, commercial and institutional boilers and process heaters.

2.4.1 Subpart Q – Cooling Towers

Spiritwood Station will include one or more cooling towers, which are subject to the cooling tower MACT standard. The standard requires that cooling tower located at major HAP sources use chromium-free water treatment chemicals.

2.4.2 Subpart ZZZZ – Diesel Engines

Spiritwood Station will include several emergency and backup diesel engine units. Per 40 CFR 63.6590(b)(1)(i), an emergency stationary reciprocating internal combustion engine (RICE) only needs to meet the initial notification requirements in §63.6645(d). Spiritwood Station will be installing a diesel-fired emergency generator and emergency fire pump engine, both of which will be subject to the aforementioned notification requirements.

2.4.3 Subpart DDDDD - Boilers

The USEPA published the final NESHAP for industrial, commercial and institutional boilers in 40 CFR Part 63 Subpart DDDDD. The NESHAP applies to industrial boilers located at facilities that are major sources of hazardous air pollutants (HAPs). Pursuant to section 63.7491, a cogeneration unit that supplies more than one-third of its potential electric output capacity, and more than 25 MW output to a utility power distribution system for sale, is an electric utility steam generating unit that is

⁶ This part also contains regulations for certain “area” source categories; however, none currently apply to the Spiritwood facility.

exempt for the Industrial Boiler MACT requirements. Since the CHP plant meets this definition, the CFB boiler will not be subject to the industrial boiler HAP emission limits; however, the auxiliary boilers (package boilers 1, 2, and 3) are subject to the Boiler MACT.

The rule divides industrial boilers by size and primary fuel. A “large” boiler is defined as one with a rated capacity greater than 10 MMBtu/hr, including the CHP plant auxiliary boilers (package boilers 1, 2, and 3). The fuels are categorized into solid, liquid, and gaseous. The rule identifies and regulates four categories of HAPs that are associated with industrial boilers. Rather than limit each individual HAP, the rule identifies maximum achievable control technology (MACT) emission limits for compounds that could be used as surrogates for all compounds in each pollutant category. In general, compliance with the Industrial Boiler MACT emissions limits for large boilers can be demonstrated by stack testing or by fuel analysis.

2.4.4 Case-by-Case MACT

The Spiritwood Station project will be a major new source of Hazardous Air Pollutants (HAPs) and several Maximum Achievable Control Technology (MACT) standards apply to various processes. However, material handling activities generally do not fall into one of the listed major HAP source categories. These sources not otherwise subject to a MACT standard require a case-by-case MACT determination because they are located at a major HAP source.

In meeting the United States Environmental Protection Agency (EPA) case-by-case MACT determination Tier II and III requirements, Spiritwood Station has referred to the information from its Best Available Control Technology (BACT) report to identify control technology options. This approach is consistent with regulatory requirements for establishing a case-by-case MACT. The use of recent case-by-case emission control equipment standards, including BACT, is an option for meeting MACT requirements as defined for available information under 40 CFR 63.41. Spiritwood Station proposes to monitor criteria particulate (PM₁₀) emissions from material handling sources as surrogates for metallic HAP emissions to demonstrate compliance with the proposed case-by-case MACT.

Table 2-2 lists the emission units subject to the case-by-case MACT requirements.

Table 2-2. Case-by-Case MACT Emission Source List Summary

EPN	Emission Unit ID	Emission Unit Description	HAP Pollutant(s)	Surrogate	Case by Case MACT Determination
002	2	Coal Unloading	Metallic HAPs	PM ₁₀	Fabric filter, 0.005 gr/dscf

Table 2-2. Case-by-Case MACT Emission Source List Summary

EPN	Emission Unit ID	Emission Unit Description	HAP Pollutant(s)	Surrogate	Case by Case MACT Determination
003	3	Coal Silo	Metallic HAPs	PM ₁₀	Fabric filter, 0.005 gr/dscf
004	4	Coal Silo Discharge	Metallic HAPs	PM ₁₀	Fabric filter, 0.005 gr/dscf
005	5	Coal Bunker	Metallic HAPs	PM ₁₀	Fabric filter, 0.005 gr/dscf
006	6	Limestone Unloading / Limestone Silo	Metallic HAPs	PM ₁₀	Fabric filter, 0.005 gr/dscf
007	7	Lime Unloading / Lime Silo	Metallic HAPs	PM ₁₀	Fabric filter, 0.005 gr/dscf
008	8	Bed Material Silo	Metallic HAPs	PM ₁₀	Fabric filter, 0.005 gr/dscf
009	9	Recycle Ash Silo	Metallic HAPs	PM ₁₀	Fabric filter, 0.005 gr/dscf
010	10	Ash Silo	Metallic HAPs	PM ₁₀	Fabric filter, 0.005 gr/dscf
011	11	Ash Loadout	Metallic HAPs	PM ₁₀	Fabric filter, 0.005 gr/dscf

In February 2002, EPA issued its draft Guidelines for case-by-case MACT determinations under Section 112(j) Requirements (EPA 453/R-94-026). Spiritwood Station has developed its case-by-case MACT determinations under the requirements of 112(g) and not 112(j). The requirement for developing a MACT floor is not required in 112(g) but it is required in 112(j). However, EPA recommends using 112(j) guidance for 112(g) case-by-case MACT development. EPA’s case-by-case guidance states: ⁷

“There is no guidance document specifically for 112(g) for doing new source MACT determinations. However, similar guidance can be found in the Guidelines for MACT Proposal Determinations under Section 112(j), May 1994, EPA 453/R-94-026. The analysis for doing new source MACT determinations is the same regardless of whether it is done under the authority of section 112(d), (g), or (j).”

In *Guidelines for MACT Proposal Determinations under 112(j)*, EPA outlines a three-tier approach to making case-by-case MACT determinations. They are as follows:

- **Tier I – Develop the MACT Floor:** A MACT floor determination is not needed under 112(g). The requirements for a complete case-by-case MACT determination are outlined in 40 63.43(d),

⁷ [<http://www.epa.gov/ttn/atw/112g/qanda12g.html>.] EPA’s 112(g) Frequently Asked Questions document which establishes using 112(j) guidance.

which is referenced in paragraph B of this section. These requirements are wholly addressed in Tier II.

- **Tier II – Consider All Control Technologies:** Tier II is the EPA guidance for evaluating multiple control technologies to determine which one meets MACT. This submittal will follow the Tier II guidelines for a MACT determination analysis.
- **Tier III – Identify MACT:** Tier III is the final regulatory step of establishing the MACT standard. In this case, the permitting authority will complete this step as part of issuing the permit. However, this application will supply information related to the requirements to making this determination.

2.4.4.1 Use of BACT to Establish Case-by-Case MACT

Spiritwood Station intends to meet the EPA case-by-case MACT determination Tier II and III requirements using information from its Best Available Control Technology (BACT) report. This approach is consistent with regulatory requirements for establishing a case-by-case MACT. Table 2-3 provides a side-by-side comparison of EPA’s guidance for case-by-case MACT to their guidance for top-down BACT analysis demonstrating that the use of a BACT analysis is equivalent to the MACT process.

Table 2-3. EPA 112(g) Case-by-Case MACT Guidance vs. EPA Top-Down BACT Guidance

MACT Step	MACT Requirement	BACT Step	BACT requirement
MACT Tier II Step 1	List all available /reasonable control technologies	BACT Step 1	Identify all available control technologies for each emission unit.
MACT Tier II Step 2	Eliminate technically infeasible control technologies	BACT Step 2	Eliminate technically infeasible control technologies
MACT Tier II Step 3	Determine the efficiency of applicable control technologies	BACT Step 3	Rank remaining control technologies listed in order of overall control effectiveness with the most effective control alternative at the top.
MACT Tier III Step 1	Identify the MACT technology	See BACT Step 5	BACT does not identify a specific technology until Step 5.
MACT Tier III Step 2	Conduct an impacts analysis. Consider emission reduction, costs, non-air health and environmental impacts and energy impacts.	BACT Step 4	Consider the energy, environmental, and economic impacts for each of the control options.

MACT Tier III Step 3	Establish the MACT limitation	BACT Step 5	Select most effective control option, based on the impacts quantified in Step 4. Establish a BACT emission limit.
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2.4.4.2 Using Criteria Pollutants as Surrogates for Individual HAPs Based on Related Industry MACT Standards

Several of the recent MACT standards promulgated by EPA set criteria pollutant standards as surrogates for the HAPs that the standard is intended to control. Spiritwood Station has followed this approach in setting case-by-case requirements. The EPA has developed MACT standards using particulate matter limits as a surrogate for controlling metallic HAP emissions in other industries such as the metallic minerals processing. In general, the EPA has found that sources which are well controlled for particulate matter (PM) are also well controlled for metallic HAPs. Most metallic HAPs are in a solid state at the operating conditions found in PM control devices and are effectively captured by standard particulate emission control equipment. The compliance demonstration plan in Section 3 contains the emission limitations for material handling processes. Particulate matter, as a surrogate for metallic HAPs, is proposed to be limited to 0.005 gr/dscf of filterable particulate.

2.5 Risk Management Programs for Chemical Accidental Release Prevention

The Risk Management Program for Chemical Accidental Release Prevention (RMP) applies to facilities that produce, process, store, or use any regulated toxic substance in excess of the thresholds listed in 40 CFR 68.130. Spiritwood Station will use ammonia injection as an air emissions control measure to reduce NOx emissions from the CFB and store propane as a backup fuel.

Propane may be subject to the USEPA’s RMP and OSHA’s Process Safety Management (PSM) regulation when the on-site quantity exceeds 10,000 lb based on its definition as a flammable substance. The CHP plant will use propane as a backup fuel source to natural gas supplied to the auxiliary boilers and CFB boiler start-up burner. Approximately 180,000 gallons of propane are currently stored within six existing horizontal pressure vessels located adjacent to the proposed CHP plant site and will become available to the CHP plant. The USEPA’s RMP rule at 40 CFR 68.126 excludes a flammable substance from the program if it is used as a fuel. Similarly, OSHA’s PSM rule at 29 CFR 1910.119(a)(1)(ii)(A) excludes hydrocarbon fuels used solely for workplace consumption as a fuel if such fuels are not a part of a process containing another highly hazardous chemical covered by the rule. Since the propane will be used only as a fuel and the boilers do not contain another highly hazardous chemical covered by PSM, the propane system is not subject to the PSM and RMP rules.

Ammonia used at the plant may be subject to the USEPA’s RMP and OSHA’s PSM regulation applicability depending on the quantity and concentration of ammonia maintained on site. Table 2-4 defines the threshold quantities for ammonia as defined by each regulation. It should be noted that a concentration of less than 44% ammonia will not trigger applicability of PSM, but may trigger RMP requirements. A concentration of less than 20% ammonia will not trigger either regulation.

Table 2-4. Ammonia Threshold Quantities.			
Ammonia Type	CAS Number	Threshold Quantity (lbs)	Basis for Listing
Anhydrous	7664-41-7	10,000 (RMP and PSM)	Mandated for listing by Congress EHS list, vapor pressure 10 mmHg or greater
≥20%wt Ammonia Concentration (aqueous)	7664-41-7	20,000 (RMP)	Mandated for listing by Congress EHS list, vapor pressure 10 mmHg or greater
≥44%wt Ammonia Concentration (aqueous)	7664-41-7	15,000 (PSM)	Mandated by OSHA

If ammonia is stored or used within a process (process as defined in either regulation) in quantities above the threshold values listed in Table 5 for each regulation, then that regulation becomes applicable to the project. The CHP plant will use 19-weight-percent aqueous ammonia in the NO_x control (SNCR) system; therefore, ammonia will not be subject to either RMP or PSM requirements.

2.6 Title V Operating Permit

40 CFR 70 provides for the establishment of comprehensive State air quality permitting programs consistent with the requirements of Title V of the CAAA. The Spiritwood Station facility will be a major source under Part 70 and permitted via North Dakota’s federally-approved Title V permit program (Chapter 33-15-14). Title V sources required to meet the requirements under section 112(g) of the Federal Clean Air Act, or to have a permit to construct under section 33-15-14-02, must submit a complete application to obtain the Title V permit within twelve months after commencing operation (33-15-14-06). The Title V application/notification will be submitted within 12 months of commencing operation on the package boilers (the first project stage). An updated application/notification will be submitted within 12 months after the CFB boiler and related coal handling begins operation.

2.7 Compliance Assurance Monitoring (CAM)

The CAM requirements are located at 40 CFR Part 64 and become part of Title V operating permits. CAM is applied to individual emission units located at major source facilities, on a pollutant by pollutant basis. In general, CAM applies to emission units meeting the following criteria:

1. The emission unit is subject to an emission limit or standard (including limits and standards in North Dakota rules contained in the State Implementation Plan) for an air pollutant regulated by Part 70;
2. Compliance with the applicable limit or standard is achieved through the use of add-on control equipment; and
3. The emission unit has pre-controlled potential emissions of the applicable regulated air pollutant that are equal to or greater than 100 percent of the Part 70 major source level for that pollutant (in tons per year).

The CAM rule does not apply to:

1. Units subject to emission limitations or standards proposed by EPA after November 15, 1990, pursuant to section 111 or 112 of the Clean Air Act. In situations where some portions of a facility operate control devices in order to comply with emission standards issued prior to November 15, 1990, only those portions of the facility must comply with the requirements of the CAM rule.
2. Situations where continuous compliance monitoring is already specified in an operating permit. The CAM rule exempts the Permittee from additional monitoring requirements and directs the Permittee to use the continuous compliance monitoring data to fulfill the CAM rule monitoring and certification requirements.
3. Stratospheric ozone protection requirements.
4. Acid Rain Program requirements.
5. Emission limitations or standards that apply solely under an emissions trading program.

The CFB boiler is subject to NSPS Da standards and monitoring, which require CEMS and COMS for particulate (opacity), SO₂, and NO_x. Therefore, CAM is not considered for the CFB boiler's control equipment.

Material handling sources are potentially subject to CAM; however, only the coal unloading process and the coal silo have a pre-control PTE greater than 100 tpy. CAM plans for these two sources have been included with the application forms (see the end of Appendix A).

The federal CAM rules are incorporated into the North Dakota rules at NDAC 33-15-14-06(10).

2.8 Acid Rain Requirements

Spiritwood Station is subject to the acid rain provisions of the CAAA found at 40 CFR Parts 72-78. The requirements are applicable to utilities and other facilities that combust fossil fuel (mainly coal) and generate electricity for wholesale or retail sale. North Dakota incorporates the Acid Rain Program at Chapter 33-15-21 and these requirements are discussed further in Section 2.10.17.

2.9 Stratospheric Ozone Protection Requirements

The regulations in this subpart implement the Montreal Protocol on Substances that Deplete the Ozone Layer and sections 602, 603, 604, 605, 606, 607, 614 and 616 of the Clean Air Act Amendments of 1990, Public Law 101-549. The Protocol and Section 604 impose limits on the production and consumption (defined as production plus imports minus exports, excluding transshipments and used controlled substances) of certain ozone-depleting substances, according to specified schedules. Spiritwood Station will comply with 40 CFR 82, Subpart F as applicable.

2.10 State of North Dakota Air Quality Rules

The following subsections detail regulatory applicability for Chapters 33-15-01 through 33-15-23 of the North Dakota Administrative Code (NDAC).

2.10.1 General Provisions (33-15-01)

The general provisions identified in Chapter 33-15-01 cover topics such as: entry onto premises, authority, variances, circumvention, severability, land use plans and zoning regulations, measurement of air contaminants, shutdown and malfunction of an installation, requirements for notification, time schedule for compliance, prohibition of air pollution, confidentiality of records, enforcement, and compliance certifications. Spiritwood Station will comply with the provisions of the chapter.

2.10.2 Ambient Air Quality Standards (33-15-02)

North Dakota AAQS are equally as stringent as federal requirements. It is the purpose of these air quality standards to set forth levels of air quality for the maintenance of public health and welfare and to provide guidance to governmental and other parties interested in abating air pollution.

Dispersion modeling for the Spiritwood Station project has been performed in accordance with the NDDH modeling policy⁸ and is summarized at Section 2.9.12.2. The full modeling report is included as Appendix F.

2.10.3 Restriction of Emission of Visible Air Contaminants (33-15-03)

New sources are prohibited from producing visible emissions of greater than twenty percent opacity, with the exception that forty percent opacity is permissible for not more than one six-minute period per hour. The Spiritwood Station facility is subject to this rule.

2.10.4 Emissions of Particulate Matter Restricted (33-15-05)

Limits for permissible particulate emissions are provided in the form of a table which is to be interpolated by the use of the following equations. Permissible particulate emissions are given as a function of the process rate. The process rate, P, is expressed in units of tons per hour and the permissible particulate matter emission rate, E, is expressed in units of pounds per hour (lb/hr).

For process weight rates up to 30 tons/hr:

$$E = 4.10 P^{0.67} \text{ (English units)}$$

For process weight rates in excess of 30 tons/hr:

$$E = 55.0 P^{0.11} - 40 \text{ (English units)}$$

Where:

E = allowable emission rate in lb/hr

P = process weight rate in tons/hr

Note that the BACT limits on the baghouses that will be installed as part of the Spiritwood Station project are much lower than the emission limits calculated based on the above equations.

Table 2-5 shows PM emissions sources and illustrates that the particulate emissions, as controlled by baghouses, comply with this regulation.

⁸ O'Clair, T.L.; North Dakota Department of Health; "Intradepartmental Memorandum: Criteria Pollutant Modeling Requirements for a Permit to Construct"; September 12, 2006

Table 2-5. Compliance with Process Weight Rate Rule

Emission Point Number (EPN)	Description	Process Weight Rate (tons/hr)	Allowable Emissions (lb/hr)	Controlled PTE (lb/hr)	Emissions below regulatory limit?
002	Coal Unloading	360	105.1	4.1	Yes
003	Coal Silo	150	95.4	0.36	Yes
004	Coal Silo Discharge	150	95.4	0.1	Yes
005	Coal Bunker	155	95.8	0.2	Yes
006	Limestone Unloading/Storage	30	40.0	0.2	Yes
007	Lime Unloading/Storage	30	40.0	0.2	Yes
008	Bed Material Silo	13	22.9	0.1	Yes
009	Recycle Ash Silo	52.8	85.1	0.06	Yes
010	Ash Silo	13	22.9	0.1	Yes
011	Ash Loadout	70	87.8	0.03	Yes

2.10.5 Emissions of Sulfur Compounds Restricted (33-15-06)

This chapter applies to any installation in which fuel is burned, in which the sulfur dioxide emissions are substantially due to the sulfur content of the fuel burned, and in which the fuel is burned primarily to produce heat.

The Spiritwood Station project will fire dried lignite coal as its primary fuel for the CFB boiler; however, this chapter does not apply to installations which are subject to a sulfur dioxide emission limit under chapter 33-15-12, which incorporates the federal new source performance standards. The Spiritwood Station CFB is subject to the SO₂ limits of NSPS Subpart Da. The three package boilers are subject to the limits of NSPS Subpart Db.

2.10.6 Control of Organic Compounds Emissions (33-15-07)

This chapter establishes requirements for organic compound facilities. Two requirements of this rule are applicable to the Spiritwood Station facility to the extent that the facility will have distillate oil available on site as a backup fuel, as summarized below:

1. Tanks must be constructed with a submerged fill pipe for use during filling operations.
2. All rotating pumps & compressors handling VOC must be equipped and operated with properly maintained seals designed for their specific product service and operating condition.

2.10.7 Control of Air Pollution from Internal Combustion Engines (33-15-08)

The provisions of this chapter allow no person to operate, or cause to be operated, any internal combustion engine which emits from any source any unreasonable and excessive smoke, obnoxious or noxious gases, fumes or vapor. Spiritwood Station vehicles and other internal combustion engines are subject to this chapter.

2.10.8 Prevention of Air Pollution Emergency Episodes (33-15-11)

The provisions of this chapter pertain to the Department of Health declaring an air pollution emergency. When an air pollution emergency episode is declared by the Department, the permittee shall comply with the requirements in NDAC 33-15-11 of the ND APC rules.

2.10.9 Standards of Performance for New Stationary Sources (33-15-12)

The state rules, in general, refer to Federal NSPS regulations. As previously discussed in Section 2.3, certain NSPS regulations apply to Spiritwood Station.

2.10.10 Emission Standards for Hazardous Air Pollutants (33-15-13)

These regulations refer to or closely emulate the Federal NESHAPs in 40 CFR 61. The Spiritwood Station facility is not one of the affected sources defined in this chapter.

2.10.11 Designated Air Contaminant Sources, Permit to Construct, Minor Source Permit to Operate, Title V Permit to Operate (33-15-14)

The Spiritwood Station facility is a “designated air contaminant source” under NDAC 33-15-14-01; therefore, a permit to construct is required. However, this application is for a permit to construct a major stationary source in accordance with the federal prevention of significant deterioration (PSD) program incorporated at NDAC 33-15-15, which supersedes NDAC 33-15-14. Following construction, Spiritwood Station will be required to apply for a Title V permit to operate within 12 months of the start of operations.

2.10.12 Prevention of Significant Deterioration of Air Quality (33-15-15)

The proposed facility will be located within an area that is designated as attainment for all criteria pollutants, and therefore the new emissions from the facility will be subject to the NSR Prevention of Significant Deterioration (PSD) requirements. The prevention of significant deterioration (PSD) rule applies to new sources that: [1] have the potential-to-emit (PTE) 100 tpy or more of any criteria pollutant for a facility that is one of the 28 industrial source categories listed in 40 CFR 52.21(b)(1)(i)(a) as referenced in NDAC 33-15-15-01.2; or [2] have the PTE 250 tpy or more of any criteria pollutant if the facility is not on the list of industrial source categories. Spiritwood Station is

considered a fossil fuel-fired steam electric plant of more than 250 million British thermal units per hour heat input, which is one of the 28 industrial source categories subject to PSD at 100 tpy. The facility-wide potential to emit of several PSD-regulated pollutants is greater than 100 tpy; therefore, the Spiritwood Station facility is subject to PSD review.

Air quality construction permits issued pursuant to the PSD regulations frequently establish more stringent requirements for specific projects than either state emission limits or NSPS. These more stringent emission limits can develop as a result of the best available control technology (BACT) review or ambient air quality impacts analyses.

2.10.12.1 Best Available Control Technology

The PSD rules require the applicant to control emissions using the Best Available Control Technology (BACT). BACT is proposed for each new source by the applicant and verified on a case-by-case basis by the NDDH during review of the air quality construction permit application. BACT is generally defined as the maximum degree of pollutant reduction achievable, taking into account energy, environmental and economic impact.

Proposed control technologies and emission limits for the CHP plant are listed in Table 2-6. The complete BACT analysis is provided as Appendix E.

Table 2-6 Proposed BACT Emission Limits and Control Technologies

Source	Pollutant	Emission Control Equipment	Performance Standard	Compliance Method
Material Handling (Coal, Ash, Lime and Limestone)	PM / PM ₁₀ Trace quantities of Pb	Fabric Filter	0.005 gr/dscf*, 3 hour Average	Test
Material Handling (Coal, Ash, Lime and Limestone)	Opacity	Fabric Filter	5%, 6-minute average	Test
* PM as measured by EPA Method 5				
CFB Exhaust	PM	Baghouse	0.015 lb/MMBtu, 3-hr average [BACT]	Test
CFB Exhaust	PM ₁₀	Baghouse	0.03 lb/MMBtu (filterable & condensable), 3-hr average [BACT]	Test
			0.012 lb/MMBtu (filterable only), 3-hr average [BACT]	Test
CFB Exhaust	Opacity	Baghouse	10%, 6 Minute Average [BACT]	COMS

Table 2-6 Proposed BACT Emission Limits and Control Technologies

CFB Exhaust	SO ₂	Limestone Injection & Dry Scrubber (Spray Dryer Absorption)	0.06 lb/MMBtu, 30-operating-day rolling average [BACT] 1.4 lb/MWh, 30-operating-day rolling average [NSPS]	CEMS CEMS
CFB Exhaust	Sulfuric Acid Mist	Limestone Injection & Dry Scrubber (Spray Dryer Absorption)	0.006 lb/MMBtu, 3 hour Average [BACT]	Test
CFB Exhaust	NO _x	SNCR	0.09 lb/MMBtu, 30-operating-day rolling average, excluding operating days when the daily average heat input is less than 772 MMBtu/hr. [BACT] 114.9 lb/hr daily average, except startup and shutdown, applicable only when the operating daily average heat input is less than 772 MMBtu/hr. 1.0 lb/MWhr, 30-operating-day rolling average, excluding startup/shutdown/malfunction (less stringent than BACT) [NSPS]	CEMS CEMS CEMS
CFB Exhaust	CO	No Add-on Controls Good Combustion Practices	0.15 lb/MMBtu, 30-operating-day rolling average, excluding operating days when the daily average heat input is less than 772 MMBtu/hr. [BACT] 191.5 lb/hr daily average applicable only when the operating daily average heat input is less than 772 MMBtu/hr.	CEMS CEMS
CFB Exhaust	VOC	No Add-on Controls Good Combustion Practices	0.007 lb/MMBtu, 3 hour Average [BACT]	Test

*PM – EPA Method 5 (Filterable PM only). PM10 - EPA Method 201 or 201A (Filterable) and 202 or EPA approved modified Method 202 procedures (Condensable).

Table 2-6 Proposed BACT Emission Limits and Control Technologies

Package Boilers Natural Gas or Propane	PM / PM10	Good Combustion Practices Clean Fuels	0.007 lb/MMBtu of PM / PM10 firing natural gas or propane, 3 hour Average	Test
Package Boilers Natural Gas or Propane	Opacity	Good Combustion Practices Clean Fuels	10%, 6-minute average	Test
Package Boilers Natural Gas or Propane	SO2	Good Combustion Practices Clean Fuels	0.006 lb SO2/MMBtu firing natural gas 0.02 lb SO2/MMBtu Firing propane	Fuels limited to natural gas and propane
Package Boilers Natural Gas or Propane	NOx	Ultra Low NOx Burners/Low NOx Burners with Flue Gas Recirculation	0.035 lb NOx/MMBtu firing natural gas, or 0.05 lb NOx/MMBtu firing propane, 30- operating-day rolling average	CEMS
Package Boilers Natural Gas or Propane	CO/VOC	Good Combustion Practices Clean Fuels	0.08 lb CO/MMBtu, 30 day rolling average; 0.005 lb VOC/MMBtu; 3 hour Average	CO CEMS VOC Test
Package Boilers Distillate Fuel Oil	PM / PM10	Good Combustion Practices Clean Fuels	0.03 lb/MMBtu of PM10 firing distillate fuel oil; 3-hour Average 0.03 lb/MMBtu of PM firing distillate fuel oil; 3-hour average	Test
Package Boilers Distillate Fuel Oil	SO2	Good Combustion Practices Clean Fuels	0.051 lb SO2/MMBtu firing distillate fuel oil	Low sulfur fuel oil
Package Boilers Distillate Fuel Oil	NOx	Ultra Low NOx Burners/Low NOx Burners with Flue Gas Recirculation	0.13 lb NOx/MMBtu firing distillate fuel oil, NOx - 30 day rolling average	CEMS
Package Boilers Distillate Fuel Oil	CO/VOC	Good Combustion Practices Clean Fuels	0.04 lb CO/MMBtu, 30 day rolling average 0.005 lb VOC/MMBtu, 3 hour Average	CO CEMS VOC Test
Propane Vaporizer	PM / PM ₁₀	Good Combustion Practices Clean Fuels	0.007 lb/MMBtu of PM / PM10 firing propane, 3-hour Average	Test
Propane Vaporizer	Opacity	Good Combustion Practices Clean Fuels	10%, 6-minute average	Test

Table 2-6 Proposed BACT Emission Limits and Control Technologies

Propane Vaporizer	SO ₂	Good Combustion Practices Clean Fuels	0.02 lb SO ₂ /MMBtu firing propane	Fuels limited to propane
Propane Vaporizer	NO _x	Ultra Low NO _x Burners/Low NO _x Burners with Flue Gas Recirculation	0.04 lb NO _x /MMBtu firing propane, 3-hour Average	Test
Propane Vaporizer	CO/VOC	Good Combustion Practices Clean Fuels	0.08 lb CO/MMBtu 0.005 lb VOC/MMBtu, 3 hour Average	Test
Cooling Tower	PM ₁₀	Mist Eliminators	0.0005% drift loss	Operate to manufacturer's specifications
Emergency Diesels	PM / PM ₁₀	Emergency Use Classification combined with Good Combustion Practices	Emergency Use Classification combined with Good Combustion Practices	NA
Emergency Diesels	Opacity	Good Combustion Practices	10% **	NA
Emergency Diesels	SO ₂	Emergency Use Classification combined with Low Sulfur Fuel	Emergency Use Classification combined with Low Sulfur Fuel	NA
Emergency Diesels	NO _x	Emergency Use Classification combined with Good Combustion Practices	Emergency Use Classification combined with Good Combustion Practices	NA
Emergency Diesels	CO/VOC	Emergency Use Classification combined with Good Combustion Practices	Emergency Generator Classification combined with Good Combustion Practices	NA
Paved Roads	PM / PM ₁₀	Best Practices & Dust Control Plan	Follow Fugitive Dust Control Plan	NA
Equipment Leaks	VOC	Routine inspection	Best Practices	NA

2.10.12.2 Air Quality Impacts Analysis

The PSD regulations limit the incremental increase of criteria pollutants that may be emitted into the ambient air (PSD Increments) and also require that compliance be demonstrated with the NAAQS, as previously discussed. Therefore, during the permitting process, the applicant must demonstrate with computer modeling the impacts that emissions from the new source may have on the ambient air quality.

PSD increments are established for Class I areas and Class II areas in the United States. Class II areas are all areas, including the project site, that are not Class I areas. The Class I areas in North Dakota are Theodore Roosevelt National Park - North and South units, Theodore Roosevelt Elkhorn Ranch Site in Billings County, and Lostwood National Wilderness Area in Burke County. The

Theodore Roosevelt areas are 217 miles (350 km) from Spiritwood Station, and Lostwood is 210 miles (338 km) from Spiritwood Station. The next closest Class I areas beyond North Dakota are Voyageurs National Park in Minnesota and the Badlands Wilderness in South Dakota, which are 330 miles (530 km) and 250 miles (400 km) from the Spiritwood CHP, respectively. The analysis of Class I impacts is generally required of new sources that are within 250 kilometers⁹ of a Class I area. Based on discussions with the NDDH regarding modeling requirements, the Spiritwood Station project is not required to prepare a Class I impacts analysis.

This section summarizes the Class II area air dispersion modeling analysis required for the Spiritwood PSD permit application. The Class II area modeling includes analysis for the criteria pollutants PM₁₀, NO_x, SO₂, and CO for compliance with the National Ambient Air Quality Standards (NAAQS), the North Dakota Ambient Air Quality Standards (NDAAQS), and the PSD increments. The detailed Class II air quality impacts analysis is presented in Appendix F of the permit application and was performed in accordance with the NDDH modeling policy¹⁰ that prescribes the modeling requirements for construction permit applications.

Results

Tables 2-7 and 2-8 summarize maximum results for the proposed project from the modeling based on the high-2nd-high (H2H) concentrations. The modeling demonstrates attainment with all applicable standards. Figures F1-F9 in Appendix F show the modeled concentrations at receptors around the facility for interim and final scenarios using the 1990-1994 meteorological data sets. The interim operating scenario prior to CFB startup was modeled to show the combined impacts of the Spiritwood package boilers and the Cargill process glycol heaters. Electronic versions of the modeling input and output files are included on the compact disk enclosed with this permit application. All modeled concentrations are within the PSD increment and ambient air quality standards.

⁹ O'Clair, T.L.; North Dakota Department of Health; "Intradepartmental Memorandum: Criteria Pollutant Modeling Requirements for a Permit to Construct"; September 12, 2006

¹⁰ *Ibid.*

Table 2-7. Results of Class II PSD Increment Analysis

Model Run	Pollutant	Averaging Period	PSD Increment (µg/m ³)	Modeled Concentrations (µg/m ³)
PSD Increment	PM ₁₀	24-hour	30	28
		Annual	17	10
	SO ₂	3-hour	512	197
		24-hour	91	36
		Annual	20	2.7
	NO _x	Annual	25	4.6

Table 2-8. Results of NAAQS/NDAAQS Analysis

Model Run	Pollutant	Averaging Period	Standard (ug/m ³)	Background (ug/m ³)	Modeled Concentrations (µg/m ³)	Total Concentration (µg/m ³)
NAAQS/NDAAQS	PM ₁₀	24-hour	150	30	26	56
		Annual	50	15	10	25
	SO ₂	1-hour	715	13	205	218
		3-hour	1300	11	197	208
		24-hour	365	9	36	45
		Annual	60	3	2.8	6
	NO _x	Annual	100	5	11	16
	CO	Not modeled because project is below significant impact levels				

2.10.12.3 Additional Impacts Analysis

Federal PSD regulations at 40 CFR 52.21(o) require the preparation of an analysis of additional impacts due to the construction and operation of a new major source. The analysis considers "...impairment to visibility, soils and vegetation that would occur as a result of the source...and general commercial, residential, industrial and other growth associated with the source...." The regulations also require "...an analysis of the air quality impact projected for the area as a result of general commercial, residential, industrial and other growth associated with the source...."

The additional impacts analysis for Class II areas is included as Appendix G of this permit application. All modeled concentrations were well below the NAAQS and NDAAQS. Attainment with the 24-hour PM₁₀ and all other pollutant PSD increments was demonstrated. The modeling also demonstrates that deposition would be at levels that have no perceptible impact on soil or vegetation.

The visibility analysis to the surrounding area addresses the coherent plumes from the facility. The potential for coherent plume visibility from the Spiritwood Station project was addressed by conducting a

Level-2 visibility screening analysis using the EPA's VISCREEN visibility screening model. Two observer locations were selected for analysis: Arrowwood National Wildlife Refuge located approximately 80 kilometers northwest of the Spiritwood Station site, and Little Yellowstone Park, the closest state park, located approximately 50 kilometers southeast of the plant site.

The results of the Level 1 analysis pass the Class I screening criteria at the Arrowwood National Wildlife Refuge, located approximately 80 kilometers northwest of the project site. However, the results do not pass the Class I screening criteria at Little Yellowstone Park, located approximately 50 kilometers southeast of the plant site. Subsequently, the VISCREEN analysis for Little Yellowstone Park is refined to a Level 2 analysis.

The primary difference between the Level 1 and Level 2 VISCREEN analysis is that the Level 1 analysis uses a worst case wind speed and stability classification, where as the Level 2 analysis uses a typical wind speed based on the historic frequency distribution of wind speed and wind direction. For this analysis, the Level 2 wind speed was 3 m/s with a 'D' stability. The Level 2 analysis indicates that the plume from the plant will not be visible from Little Yellowstone Park.

Economic growth as a result of the project is tied to employment during construction and ultimately operation of the Spiritwood facility. The construction phase of the proposed generating plant and related facilities is anticipated to produce a temporary work force with a peak of approximately 100 persons. Operation of the facility will require approximately 40 full-time equivalent workers. It is anticipated that the permanent work force will be drawn from the surrounding area communities while the construction work force, including the specialty trades required, will be drawn from a considerably larger region. However, because the former population of the surrounding towns used to be much greater when agriculture was more labor intensive, significant increases in infrastructure and housing are not expected. The population of the Stutsman County area has actually decreased by about 5% since 2000, a decrease of about 1,100 people.

Local commerce activity is expected to increase in order to provide services to the increased labor force. Motels, hotels and rental units will increase in occupancy to provide temporary housing during the construction period. Consequently, the support service, retail, food service, trade and real estate industries are expected to experience an increase in business activity as a result of the project.

The traffic volumes implied by constructing and operating the Spiritwood Station project represent a potential for an increase of slightly more than 15 percent of the daily traffic on County Highway 22 (500 -

800 vehicles/day in 2004)¹¹ if all construction workers were to travel to the site from Jamestown. The long term impact on highway traffic for potentially 40 employees to travel daily from Jamestown to the Spiritwood Station plant, for coal deliveries and ash shipments would be about a 6 percent increase. The incremental increase in traffic in a rural setting is expected to have a negligible effect on air quality.

Between the rural setting and the infrastructure that is already in place, no adverse impacts to air quality from population growth as a result of this project are expected.

2.10.13 Restriction of Odorous Air Contaminants (33-15-16)

In areas located within a city or the area over which a city has exercised extraterritorial zoning as defined in ND Century Code 40-47-01.1, a person may not discharge into the ambient air any objectionable odorous air contaminant that measures seven odor concentration units or higher outside the property boundary where the discharge is occurring.

Given modern coal-fired boiler design for optimal combustion and the application of best available control technology, Spiritwood Station does not anticipate odorous emissions from the facility.

2.10.14 Restriction of Fugitive Emissions (33-15-17)

This chapter restricts fugitive emissions from any source without taking reasonable precautions to prevent such emissions from causing air pollution. Spiritwood Station will comply with this regulation by taking reasonable precautions to prevent the release of fugitive emissions from causing air pollution, including building and conveyor enclosures and enclosed coal and ash storage.

2.10.15 Stack Heights (33-15-18)

This chapter restricts the use of stack heights above good engineering practice (GEP) as well as other dispersion techniques to affect the concentration of a pollutant in the ambient air. Spiritwood Station will not take credit for stack heights in excess of GEP or use other dispersion techniques when determining the degree of emission limitation required.

2.10.16 Visibility Protection (33-15-19)

A new major stationary source is required to demonstrate to the Department that the actual emissions from the source, including fugitive emissions, will not cause or contribute to adverse impact on visibility within any federal Class I area. Class I areas include national parks, wilderness areas, and

¹¹ North Dakota DOT; 2004 Traffic Volume Map for Jamestown, Stutsman County, North Dakota.

wildlife refuges. The Clean Air Act also mandates that Federal Land Managers protect the air quality related values, including visibility, in Class I areas.

The Class I areas in North Dakota are Theodore Roosevelt National Park - North and South units, Theodore Roosevelt Elkhorn Ranch Site in Billings County, and Lostwood National Wilderness Area in Burke County. The Theodore Roosevelt areas are 217 miles (350 km) from Spiritwood Station, and Lostwood is 210 miles (338 km) from Spiritwood Station. The next closest Class I areas beyond North Dakota are Voyageurs National Park in Minnesota and the Badlands Wilderness in South Dakota, which are 330 miles (530 km) and 250 miles (400 km), respectively from the CHP plant. The analysis of Class I impacts is generally required of new sources that are within 250 kilometers¹² of a Class I area. Based on distances and discussions with the NDDH regarding modeling requirements, Spiritwood Station project is not required to prepare a Class I impacts analysis.

2.10.17 Acid Rain Program (33-15-21)

As described above in the federal section, the Spiritwood Station CFB boiler is subject to the provisions of the Acid Rain Program. The affected source owner must submit an acid rain permit application to the NDDH, which in turn issues and administers the permit. The acid rain permit becomes part of the larger Title V permit. The acid rain permit specifies the affected unit's allowance allocation, which is zero for new units, and a NO_x limitation, which will not be applicable to the CFB unit¹³. A monitoring plan for the CFB will be required to be submitted to manage SO₂ allowances within the Clean Air Markets system for each ton of SO₂ emitted each year. All affected units must hold sufficient SO₂ allowances by the allowance transfer deadline to account for SO₂ emissions for each calendar year. This is the only SO₂ compliance option in Phase II of the Acid Rain Program, and it is automatically noted in the acid rain permit application.

2.10.18 Emissions Standards for Hazardous Air Pollutants for Source Categories (33-15-22)

Spiritwood Station will be a major HAP emission source, subject to several standards in this chapter.

¹² O'Clair, T.L.; North Dakota Department of Health; "Intradepartmental Memorandum: Criteria Pollutant Modeling Requirements for a Permit to Construct"; September 12, 2006

¹³ Definitions at 40 CFR 76.2 define Group 1 boilers as tangentially fired, or dry bottom wall-fired boilers (other than a unit applying cell burner technology). Group 2 boilers are defined as wet bottom wall-fired boilers, cyclone boilers, boilers applying cell burner technology, vertically fired boilers, arch-fired boilers, or any other type of utility boilers (such as a fluidized bed or stoker boilers) that are not Group 1 boilers. The NO_x emission limits at 40 CFR 76.6 for Group 2 boilers do not include a standard for fluidized bed boilers.

2.10.19 Fees (33-15-23)

Spiritwood Station is responsible for a \$150 filing fee for construction permit applications, plus any additional fees based on actual processing costs.

3.0 Compliance Demonstration

3.1 Compliance Demonstration for PSD, NSPS and NESHAPs

As described in Section 2.10.12.1, Spiritwood Station has prepared an analysis of best available control technology (BACT) and applicability to several emission standards for criteria and hazardous air pollutants. The BACT and performance standards make up the federally enforceable emission limits proposed within the compliance plan presented in this section. The proposed limits for the project are summarized in Table 3-1.

The identification of specific regulatory requirements for the facility and for each emission unit is outlined in the compliance plan, which is provided in Tables 3.1 to 3.12.

Table 3-1. Compliance Plan – BACT Limits

Citation	EPN	Emission Limit	Monitoring & Testing	Recordkeeping	Notifications & Reporting
<p>40 CFR 52.21(j) – BACT 40 CFR 60, NSPS Da</p>	<p>001 CFB Boiler</p>	<p>SO₂: 0.06 lb/MMBtu, 30-operating-day rolling average [BACT] 1.4 lb/MWh, 30-operating-day rolling average [NSPS]</p> <p>NO_x: 0.09 lb/MMBtu, 30-operating-day rolling average, excluding operating days when the daily average heat input is less than 772 MMBtu/hr. [BACT] 114.9 lb/hr daily average, excluding startup and shutdown, applicable only when the operating daily average heat input is less than 772 MMBtu/hr. 1.0 lb/MWhr, 30-operating-day rolling average, excluding startup/shutdown/malfunction (less stringent than BACT) [NSPS]</p> <p>PM₁₀: 0.03 lb/MMBtu (filterable & condensable), 3-hr average [BACT] 0.013 lb/MMBtu (filterable only), 3-hr average [BACT]</p> <p>PM: 0.015 lb/MMBtu (filterable), 3-hr average [BACT]</p> <p>Opacity: 10 percent; except one 6-minute period per hour of not more than 27%</p> <p>CO: 0.15 lb/MMBtu, 30-operating-day rolling</p>	<p>NSPS (Subpart Da) limit for SO₂ applies during periods of startup/ shutdown.</p>		

Table 3-1. Compliance Plan – BACT Limits

		<p>average, excluding operating days when the daily average heat input is less than 772 MMBtu/hr. [BACT]</p> <p>191.5 lb/hr daily average applicable only when the operating daily average heat input is less than 772 MMBtu/hr.</p> <p>VOC: 0.007 lb/MMBtu (3-hr average)</p> <p>Sulfuric Acid Mist: 0.006 lb/MMBtu</p> <p>Lead: Particulate as surrogate – comply with PM limits</p>			
40 CFR 52.21(j) – BACT	001 CFB Boiler	Spiritwood Station will operate and optimize the SNCR NOx control system as needed to meet the BACT limit and to minimize ammonia slip and the formation of condensables.			
40 CFR 52.21(j) – BACT	014 Package Boilers (each)	<p>SO₂: 0.006 lb/MMBtu (natural gas) 0.02 lb/MMBtu (propane) 0.051 lb/MMBtu (distillate)</p> <p>NO_x: 0.035 lb NO_x/MMBtu (natural gas); 0.05 lb NO_x/MMBtu propane); 0.13 lb/MMBtu (distillate oil)</p> <p>PM/PM₁₀: 0.007 lb/MMBtu (natural gas/ propane; 3-hour avg) 0.03 lb/MMBtu (distillate oil; 3-hr avg)</p> <p>Opacity: 10%; except one 6-minute period of not more than 27%</p>			

Table 3-1. Compliance Plan – BACT Limits

	014 Package Boilers (each) (cont)	CO: 0.08 lb/MMBtu (natural gas and propane; 30-day rolling avg) 0.04 lb/MMBtu (distillate oil; 3-hour avg) VOC: 0.005 lb/MMBtu (3-hour avg) 0.005 lb/MMBtu (distillate oil; 3-hr avg)			
40 CFR 52.21(j) – BACT	002 – 011	PM/PM₁₀: 0.005 grains/dscf Opacity: 5%			
	015, 018	Emergency service only (500 operating hours per year); low sulfur fuel			
40 CFR 52.21(j) – BACT	017	SO₂: 0.02 lb/MMBtu (propane) NO_x: 0.04 lb/MMBtu (propane) PM/PM₁₀: 0.007 lb/MMBtu (propane) CO: 0.08 lb/MMBtu (propane) VOC: 0.005 lb/MMBtu (propane)			
40 CFR 52.21(j) – BACT	016	0.0005 percent drift loss			

Table 3-2. Permit Application Content					
Citation	EPN	Emission Limit	Monitoring & Testing	Recordkeeping	Notifications & Reporting
33-15-14-02 (2) Permit to construct.	001	The CFB boiler is limited to firing the following permitted fuel types: coal (dried lignite, raw lignite, subbituminous) and natural gas and propane for startup			
33-15-14-02 (2) Permit to construct.	014	The package boilers are limited to firing the following permitted fuel types: natural gas, propane and distillate oil.			

Table 3-3. Compliance Plan for 40 CFR 60 Subpart A—General Provisions					
Citation	EPN	Emission Limit	Monitoring & Testing	Recordkeeping	Notifications & Reporting
40 CFR 60, Subpart A NDAC 33-15-12-02	001, 014, 015, 016, 017, 018	N/A	<ul style="list-style-type: none"> Conduct initial performance tests within 60 days of achieving maximum production rates, but no later but no later than 180 days from startup, using performance test methods specified in each subpart, per §60.8(a) Performance tests conducted and data reduced in accordance with test methods and procedures contained in each applicable subpart, per §60.8(b) Performance tests conducted 	<ul style="list-style-type: none"> Records of occurrence and duration of any startup, shutdown, or malfunction of affected facilities, or malfunction of air pollution control equipment, per §60.7(b) Records of all measurements, calibration checks, adjustments and maintenance, and all other information required by 40 CFR 60, per §60.7(f) 	<ul style="list-style-type: none"> Submit reports to NDDH at address listed in §60.4(b)(JJ) Notification of date construction commenced within 30 days, per §60.7(a)(1) Notification of date of initial startup within 15 days, per §60.7(a)(3) Notification of physical or operational changes that may increase emissions 60 days (or as soon as practical) prior to making change, per §60.7(a)(4)

Table 3-3. Compliance Plan for 40 CFR 60 Subpart A—General Provisions

			<p>under operating conditions specified and operating records provided to NDDH, per §60.8(c)</p> <ul style="list-style-type: none"> • Emissions in excess of the applicable limit during periods of startup, shutdown, and malfunction, shall not be considered a violation unless otherwise specified, per §60.8(c) • Provide performance testing facilities, per §60.8(e) 		
<p>40 CFR 60, Subpart A NDAC 33-15-12-02 (Continued from previous page)</p>	<p>001, 012, 013, 014, 015, 016, 017, 018</p>	<p>N/A</p>	<ul style="list-style-type: none"> • Performance test consist of 3 separate runs unless otherwise specified in an applicable subpart, per §60.8(f) • Opacity compliance determined using Method 9 unless otherwise specified, per §60.11(b) • Opacity standards apply at all times except during periods of SSM and as otherwise provided in applicable standard, per §60.11(c) • Maintain and operate equipment in a manner consistent with air pollution control practices for minimizing emissions at all times, per §60.11(d) • Opacity compliance initially determined concurrently with 	<p>See previous page</p>	<ul style="list-style-type: none"> • Excess emissions reporting required by an applicable subpart that is more frequent than semi-annual may be reduced to semi-annual provided the conditions in §60.7(e) are met • May send EPA copies of reports submitted to any other State or local agency that substantially meet the requirements of §§60.7(a), per 60.7(g) • Notification of date of performance tests at least 30 days prior to testing, per §60.8(d)

Table 3-3. Compliance Plan for 40 CFR 60 Subpart A—General Provisions

			<p>other required performance tests, per §60.11(e)</p> <ul style="list-style-type: none"> • Special provisions in any subpart supersedes any conflicting provisions in §§60.11(a)-(e), per 60.11(f) 		
<p>40 CFR 60, Subpart A NDAC 33-15-12-02 (Continued from previous page)</p>	<p>001, 014, 015, 016, 017, 018</p>	<p>N/A</p>	<ul style="list-style-type: none"> • Any credible evidence may be used to determine the compliance status of any source, per §60.11(g) • Compliance with standards other than opacity determined using performance tests unless otherwise specified, per §60.11(a) • No one subject to provisions of 40 CFR 60 shall build, erect, install, or use any article, machine, equipment or process which conceals emission which would otherwise constitute a violation of an applicable standard, per §60.12 	<p>See previous page</p>	<p>See previous page</p>

Table 3-4. Compliance Plan for 40 CFR 60 Subpart Da – Standards of Performance for Electric Utility Steam Generating Units for Which Construction is Commenced After September 18, 1978

Citation	EPN	Emission Limit	Monitoring & Testing	Recordkeeping	Notifications & Reporting
<p>40 CFR 60.42Da(c)(2)</p> <p>40 CFR 60.43Da(i)(1)</p> <p>40 CFR 60.44Da(e)(1)</p> <p>40 CFR 60.45Da(a)(3)</p> <p>NDAC 33-15-12-02</p>	001	<p>For CFB Boiler</p> <p>PM: 0.14 lb/MWhr gross energy output, or 0.03 lb/MMBtu [less stringent than BACT]</p> <p>SO₂: 1.4 lb/MWh gross (30-day rolling average) or 95% control (30-day rolling avg)</p> <p>NO_x: 1.0 lb/MWh gross energy output, 30-day rolling average</p> <p>Mercury: 175 X 10⁻⁶ lb/MWh gross, output basis (lignite); 66 X 10⁻⁶ lb/MWh gross, output basis (subbituminous)</p>			
40 CFR 60.48Da (c)	001	The particulate matter emission standards under §60.42Da, the nitrogen oxides emission standards under §60.44Da, and the Hg emission standards under §60.45Da apply at all times except during periods of startup, shutdown, or malfunction.			

Table 3-4. Compliance Plan for 40 CFR 60 Subpart Da – Standards of Performance for Electric Utility Steam Generating Units for Which Construction is Commenced After September 18, 1978					
40 CFR 60.48Da (e), (f)	001		Initial compliance testing for NO _x and SO ₂ is performed as a 30-day average.		The initial performance test is to be scheduled so that the first boiler operating day of the 30 successive boiler operating days is completed within 60 days after achieving the maximum production rate, but not later than 180 days after initial startup of the facility.
40 CFR 60.48Da (i)	001				...calculate NO _x emissions by multiplying the average hourly NO _x output concentration, measured according to the provisions of §60.49Da(c), by the average hourly flow rate, measured according to the provisions of §60.49Da(l), and dividing by the average hourly gross energy output, measured according to the provisions of §60.49Da(k).
40 CFR 60.48Da (l)	001		Compliance with the applicable mercury standard under §60.45Da is determined on a 12-month rolling average basis.	calculate the Hg emission rate (lb/MWh) for each calendar month of the year, using hourly Hg concentrations measured according to the provisions of §60.49Da(p) in conjunction with hourly stack gas volumetric flow rates measured according to the provisions of §60.49Da(l) or (m), and hourly gross electrical outputs, determined according to the provisions in §60.49Da(k).

Table 3-4. Compliance Plan for 40 CFR 60 Subpart Da – Standards of Performance for Electric Utility Steam Generating Units for Which Construction is Commenced After September 18, 1978					
40 CFR 60.48Da (m), (n)	001				Calculate SO ₂ and PM emissions by multiplying the average measured hourly PM output concentration by the average hourly flow rate, and divide by the average hourly gross energy output. Compliance is determined by the arithmetic average of the hourly emission rates calculated daily.
40 CFR 60.48Da (o)	001		For particulate limit compliance: conduct initial performance test, use COM, install and operate a fabric filter bag leak detection system		
40 CFR 60.49Da (a), (b), (c), (d)	001		Install, calibrate, maintain, and operate a continuous monitoring system for opacity, SO ₂ , NO _x , O ₂ (CO ₂).		
40 CFR 60.49Da (e)	001		Operate and record data from CEMs/COM during all periods including CFB SSM, except during CMS breakdown, repair, calibration and span adjustment.		
40 CFR 60.49Da (f)(2)	001		Obtain emission data for at least 90 percent of all operating hours for each 30 successive boiler operating days.		

Table 3-4. Compliance Plan for 40 CFR 60 Subpart Da – Standards of Performance for Electric Utility Steam Generating Units for Which Construction is Commenced After September 18, 1978

			<p>If this minimum data requirement cannot be met with a CMS, supplement emission data with other approved monitoring systems or the reference methods and procedures as described in paragraph (h) of this section.</p>		
40 CFR 60.49Da (k)(1-3)	001		<p>Gross output determination for an electricity and process steam generation facility demonstrating compliance with the output-based standard under §60.44Da(d)(1):</p> <p>(1) install, calibrate, maintain, and operate a wattmeter; measure gross electrical output in megawatt-hour on a continuous basis; and record the output of the monitor.</p> <p>(2) install, calibrate, maintain, and operate meters for steam flow, temperature, and pressure; measure and record gross process steam output in joules per hour (or Btu per hour) on a continuous</p>		

Table 3-4. Compliance Plan for 40 CFR 60 Subpart Da – Standards of Performance for Electric Utility Steam Generating Units for Which Construction is Commenced After September 18, 1978

			<p>basis</p> <p>(3) for affected facilities generating process steam in combination with electrical generation, the gross energy output is determined from the gross electrical output measured in accordance with paragraph (k)(1) of this section plus 75 percent of the gross thermal output (measured relative to iso conditions) of the process steam measured in accordance with paragraph (k)(2) of this section.</p>		
40 CFR 60.49Da (m)	001		<p>Data from a continuous flow monitoring system certified according to the requirements of 40 CFR 75.20 may be used to comply with Subpart Da requirements.</p>		
40 CFR 60.49Da (p)	001		<p>Install and operate a CEMS to measure and record the concentration of Hg in</p>		

Table 3-4. Compliance Plan for 40 CFR 60 Subpart Da – Standards of Performance for Electric Utility Steam Generating Units for Which Construction is Commenced After September 18, 1978					
			the exhaust gases according to the requirements in paragraphs (p)(1) through (p)(3) of this section.		
40 CFR 60.49Da (s)	001				Prepare and submit a monitoring plan for each monitoring system, at least 45 days before commencing certification testing of the monitoring systems. The owner or operator shall comply with the requirements in your plan. The plan must address the requirements in paragraphs (s)(1) through (6) of this section.
40 CFR 60.50Da (a), (b), (c), (d), (e), (g), (h), (i)	001		Permittee shall use standard test methods, alternative test methods and computational methods as provided in Section 60.50Da.		
40 CFR 60.51Da (a)-(k)	001				Initial and subsequent performance tests reports, SO2 and NOx reporting, missing data substitution, emergency conditions, CEMS malfunction statements, mercury emissions reporting, data certification, excess emissions reports shall be submitted in accordance with Sections 60.51Da (a)-(k).

Table 3-5. Compliance Plan for 40 CFR 60, Subpart Db – Industrial-Commercial-Institutional Steam Generating Units

Citation	EPN	Emission Limit	Monitoring & Testing	Recordkeeping	Notifications & Reporting
<p>40 CFR 60, Subpart Db</p> <p>NDAC 33-15-12-02</p>	<p>014 (Three boilers sharing one stack emission point and one CEMS)</p>	<p>For package boilers: NO_x: 0.2 lb/MMBtu [Less stringent than BACT]</p>	<ul style="list-style-type: none"> • NO_x limits apply at all times per §60.44b(h) and §60.46b(a) • Compliance with NO_x limits determined on 30-day rolling average basis per §60.44b(i) • CEMS used to conduct NO_x performance tests per §§60.46b(c) and (e) • CEMS used to monitor NO_x emissions per §§60.48b(b)(1) and (g)(1) • CEMS operated at all times except for CEMS breakdowns and repairs, per §§60.48b© and (g)(1) • NO_x CEMS hourly emissions processed per §§60.48b(d), (e)(2), (e)(3), (f), and (g)(1) • CEMS operated during all periods of operation of the affected facility except for CEMS breakdowns and repairs per §§60.48b© and (g)(1) 	<ul style="list-style-type: none"> • Record NO_x CEMS data per §§60.48b(b)-(c) • Maintain records of amount of natural gas combusted per §60.49b(d) • Maintain information in §60.49b(g) for each operating day per §60.49b(i) • All records maintained for period of 5 years after recording per §60.49b(o) 	<ul style="list-style-type: none"> • CEMS data collected pursuant to §§60.46b(g)(1) used to calculate 30-day rolling average NO_x emissions on a daily basis and in excess emission reports, per §60.46b(e)(4) • Submit excess NO_x emission reports per §60.49b(h)(2)(i) • Excess NO_x emissions defined in §60.49b(h)(4) • NO_x data must be reported per §§60.49b(i) and include the information in §60.49b(g) • Reports may be submitted electronically if agreed to by NDDH per §60.49b(v) • Report semi-annually per §60.49b(w)
<p>40 CFR 60, Subpart Db</p>	<p>014</p>		<ul style="list-style-type: none"> • Hourly NO_x CEMS data processed per 		

Table 3-5. Compliance Plan for 40 CFR 60, Subpart Db – Industrial-Commercial-Institutional Steam Generating Units

<p>NDAC 33-15-12-02</p> <p>(Continued from previous page)</p>			<p>§§60.48b(d) and (g)(1)</p> <ul style="list-style-type: none"> • NO_x CEMS installed, evaluated, and operated following the procedures in §§60.13 per 60.48b(e), (e)(2), (e)(3), and (g)(1) • NO_x CEMS span value determined per §§60.48b(e)(2)-(3) and (g)(1) • When NO_x CEMS is down, emission data obtained following the procedures in §§60.48b(f) and (g)(1) • If requested by NDDH, compliance with NO_x standards will be determined using a 30-day performance test, per §60.46b(e)(4) 		
<p>40 CFR 60, Subpart Db</p> <p>NDAC 33-15-12-02</p>	<p>014</p>	<p>PM/PM₁₀: 0.025 lb/MMBtu CO: 0.075 lb/MMBtu SO₂: 0.2 lb/MMBtu [Less stringent than BACT]</p>	<ul style="list-style-type: none"> • SO₂ limits apply at all times per §§60.45b(a) and 60.47b(a) • Conduct performance tests using methods procedures in 40 CFR 60, Appendix A, per §60.45b(b) • Compliance with the SO₂ standards determined using a performance test, per §§60.45b(b) and (d) • Compliance with the PM 	<p>N/A</p>	<ul style="list-style-type: none"> • Initial startup notification to include information listed in §§60.49b(a), (a)(1), and (a)(3) • Submit performance test data from initial performance test and performance evaluations of SO₂ CEMS per §60.49b(b) • Submit reports of SO₂ emissions data per §§60.49b(j), (k), (l), and (m) • Submit initial performance test and the performance evaluation of the CEMS, per §60.49b(b)

Table 3-5. Compliance Plan for 40 CFR 60, Subpart Db – Industrial-Commercial-Institutional Steam Generating Units

			<p>standards determined using a performance test, per §60.45b(c)(1)</p> <ul style="list-style-type: none"> • Conduct initial performance testing over first 30 consecutive operating days of each boiler per §60.46b(e)(1) • In lieu of performance testing, Permittee may elect to install a PM CEMS per §60.46b(j) • CEMS used to monitor SO₂ emissions per §§60.47b(a) utilizing procedures in (c)-(e)(2) 		
<p>40 CFR 60, Subpart Db</p> <p>NDAC 33-15-12-02 (Continued from previous page)</p>	014	See previous page	<ul style="list-style-type: none"> • In lieu of SO₂ emissions monitoring, maintain fuel supplier certifications of sulfur content of natural gas per §60.47b(g) • In lieu of PM emissions monitoring, maintain fuel supplier certifications of sulfur content of natural gas per §60.48b(j) 	N/A	See previous page

Table 3-6. Compliance Plan for 40 CFR Subpart Y – Standards of Performance for Coal Preparation Plants

Citation	EPN	Emission Limit	Monitoring & Testing	Recordkeeping	Notifications & Reporting
40 CFR 60.250 (a)	002, 003, 004		The provisions of this subpart are applicable to any of the following affected facilities in coal preparation plants which process more than 181 Mg (200 tons) per day: ...coal storage systems, and coal transfer and loading systems.		
40 CFR 60.250 (c)	002, 003, 004	20% opacity [Less stringent than BACT]			
40 CFR 60.254 (c)	002, 003, 004		Method 9 and the procedures in §60.11 shall be used to determine opacity.		

Table 3-7. Compliance Plan for 40 CFR 60, Subpart III – Stationary Compression Ignition Internal Combustion Engines

Citation	EPN	Emission Limit	Monitoring & Testing	Record keeping	Notifications & Reporting
40 CFR 60.4205(c)	015		Owners and operators of fire pump engines with a displacement of less than 30 liters per cylinder must comply with the emission standards in table 4 to this subpart, for all pollutants.		
40 CFR 60.4205(d)	018		<p>Owners and operators of emergency stationary CI ICE with a displacement of greater than or equal to 30 liters per cylinder must meet the requirements in paragraphs (d)(1) and (2) of this section.</p> <p>(1) Reduce NOX emissions by 90 percent or more, or limit the emissions of NOX in the stationary CI internal combustion engine exhaust to 1.6 grams per KW-hour (1.2 grams per HP-hour).</p> <p>(2) Reduce PM emissions by 60 percent or more, or limit the emissions of PM in the stationary CI internal combustion engine exhaust to 0.15 g/KW-hr (0.11 g/HP-hr).</p>		
40 CFR 60, Subpart III	015, 018		<ul style="list-style-type: none"> • After 12/31/2008, may not install stationary CI ICE, excluding fire pump engines, that do not meet 2007 model year standards (other standards in later model years), per §60.4206 • Performance tests must be conducted according to in-use testing procedures in 40 CFR 1039, Subpart F, per §60.4212(a) 	N/A	N/A
40 CFR 60.4209(a)	015, 018		(a) If you are an owner or operator of an emergency stationary CI internal combustion engine, you must install a non-resettable hour meter prior to startup of the engine.		
40 CFR 60.4211(e)	015, 018		Emergency stationary ICE may be operated up to 100 hours/year for maintenance checks and readiness testing; any operation other than emergency operation, and maintenance and testing is prohibited, per §60.4211(e)		No initial notification is required for emergency stationary ICE, per §60.4214(b)
40 CFR 60.4214(b)	015, 018			The owner must record the time of operation of the engine and the reason the engine was in operation during that time.	

Table 3-8. Compliance Plan for 40 CFR 63 Subpart A – General Provisions

Citation	EPN	Emission Limit	Monitoring & Testing	Recordkeeping	Notifications & Reporting
40 CFR 63, Subpart A NDAC 33-15-22	002 – 018	N/A	<ul style="list-style-type: none"> • New area sources that become major must comply with standards immediately upon becoming major, per §§63.6(a)(2), (b)(7), and (c)(5) • Sources must comply with relevant standards upon startup, per §63.6(b)(2) • No source at Spiritwood Station will be subject to any opacity or visible emissions standards, so §63.6(h) does not apply • The President may exempt any source category from requirements to comply with any otherwise applicable rule, per §63.6(j) 	<ul style="list-style-type: none"> • Records, including all reports and notifications, must be in a form suitable and readily available for expeditious inspection and review and may be maintained electronically, per §63.10(b)(1) • If source granted a waiver under §63.10(f), maintain records of any information demonstrating whether a source is meeting the requirements for a waiver of recordkeeping or reporting requirements under Part 63, per §63.10(b)(2)(xii) • Maintain all documentation supporting initial notifications and notifications of compliance status, per §63.10(b)(2)(xiv) • Records regarding applicability determinations must be maintained onsite for 5 years, per §63.10(b)(3) 	<ul style="list-style-type: none"> • Implement quality assurance program to ensure validity of performance tests as specified in §63.7(c) • Submit site-specific test plan at least 60 calendar days before the performance test, per §63.7(c)(2) • Follow procedures in §63.7(h) if requesting a waiver of a performance testing requirement • Submit notifications to NDDH and EPA as specified in §63.9(a) • Request an extension of compliance as specified in §63.9(c), if necessary • If necessary, submit requests for modifications to submittal deadlines to the NDDH as specified in §63.9(i) • Submit reports to the NDDH in accordance with the reporting requirements of the relevant standard(s), per §63.10(d)(1) • Report performance test results as specified in §63.10(d)(2)

Table 3-8. Compliance Plan for 40 CFR 63 Subpart A – General Provisions

<p>40 CFR 63, Subpart A NDAC 33-15-22 (Continued from previous page)</p>	<p>002 – 018</p>	<p>N/A</p>			<ul style="list-style-type: none"> • Progress reports under extensions of compliance submitted as specified in §63.10(d)(4) • Follow procedures in §63.10(f) when requesting a waiver of any recordkeeping or reporting requirements under Part 63
<p>40 CFR 63, Subpart A NDAC 33-15-22</p>	<p>002 – 018</p>	<p>N/A</p>	<ul style="list-style-type: none"> • Operate to minimize emissions and correct malfunctions as soon as practicable, per §63.6(e)(1) • Develop and implement Startup, Shutdown, and Malfunction (SSM) Plan according to §63.6(e)(3), with the exceptions for Subparts EEEE and FFFF noted below • Comply with emission standards at all times except during SSM, per §63.6(f)(1) • Compliance determinations may be based on performance tests, operation and maintenance plans, records, and inspections, per §63.6(f)(2)-(3) • Spiritwood Station will utilize the procedures in §63.6(g) if an alternative emission standard is desired • Spiritwood Station will utilize the procedures in §63.6(i) if requesting a 	<ul style="list-style-type: none"> • Records retained for at least 5 years following the date of each occurrence, measurement, maintenance, corrective action, report, or record, per §63.10(b)(1). Records must be retained onsite for 2 years; the remaining 3 years may be retained offsite. • Maintain records of all required maintenance performed on air pollution control and monitoring equipment, per §63.10(b)(2)(iii) • Maintain records of all required measurements needed to demonstrate compliance with a relevant standard, per §63.10(b)(2)(vii) • Maintain records of all results of performance tests and Continuous Monitoring System (CMS) performance evaluations, per 	<ul style="list-style-type: none"> • Complete preconstruction review and notification requirements, per 40 CFR 63.5 • Notify NDDH at least 60 calendar days prior to conducting performance tests, per §§63.7(b)(1) and 63.9(e). Notify NDDH as soon as practicable when rescheduling performance tests, per 63.7(b)(2). • Submit initial notifications specified in §63.9(b) • Provide notification that source is subject to special compliance requirements as specified in §63.9(d), if necessary • Submit reports following the general submittal procedures outlined within §63.10(a)

Table 3-8. Compliance Plan for 40 CFR 63 Subpart A – General Provisions

			compliance extension	§63.10(b)(2)(viii)	
40 CFR 63, Subpart A NDAC 33-15-22 (Continued from previous page)	002 – 018	N/A	<ul style="list-style-type: none"> • NDDH or the Administrator may request a performance test at any time under Section 114 of the Clean Air Act, per §63.7(a)(3) • Notify NDDH of performance tests at least 60 calendar days prior to test, and in the event of rescheduling the test as soon as practicable and without delay, per §63.7(b) • Submit site-specific performance test plan, including quality assurance procedures to be used, per §63.7(c) • Provide performance testing facilities as specified in §63.7(d) • Conduct performance tests as specified in §63.7(e) • Follow procedures for use of an alternative test method as specified in §63.7(f) • Performance test data and reports must be submitted within 60 days after the end of a test, must include raw data, and data must be kept for 5 years, per §63.7(g) 	<ul style="list-style-type: none"> • Maintain records of all measurements as may be necessary to determine the conditions of performance tests and performance evaluations, per §63.10(b)(2)(ix) 	See previous page
40 CFR 63, Subpart A NDAC 33-15-22 (Continued from	002 – 018	N/A	<ul style="list-style-type: none"> • Performance tests conducted as specified unless a waiver is granted by the NDDH per 	See previous page	Notifications of Compliance Status shall contain the information specified in

Table 3-8. Compliance Plan for 40 CFR 63 Subpart A – General Provisions

previous page)			§63.7(h)		<p>§63.9(h) and are due to the NDDH within 60 days of completion of performance test or other compliance demonstration</p> <p>Any change in the information already provided under §63.9 shall be submitted to the NDDH in writing within 15 calendar days of making the change, per §63.9(j)</p> <p>Submit periodic and immediate startup, shutdown, and malfunction reports as specified in §63.10(d)(5)</p>
40 CFR 63, Subpart A NDAC 33-15-22	002 – 018	N/A	<ul style="list-style-type: none"> • Conduct initial performance tests within 180 days of the compliance date listed within each applicable Subpart, per §63.7(a) 	<ul style="list-style-type: none"> • Maintain records of startup, shutdown, or malfunction of equipment operation, air pollution control equipment, per §§63.10(b)(i)-(ii) and (iv)-(v) 	
40 CFR 63, Subpart A NDAC 33-15-22	002, 003, 004	N/A	<ul style="list-style-type: none"> • Equipment subject to all monitoring requirements in standard, per §63.8(a)(1) • The performance specifications in 40 CFR 60 Appendix B apply, per §63.8(a)(2) and Table 10 of Subpart DDDDD • Conduct monitoring according to Subpart DDDDD unless NDDH approves an alternative method, per §63.8(b)(1)(i)-(ii) • CMSs installed as specified 	<ul style="list-style-type: none"> • Keep written CMS quality control procedures on record for the life of the affected source, or until affected source is no longer subject to the provisions of Part 63, per §63.8(d)(3) • Maintain any superseded versions of the CMS performance evaluation plan for 5 years after each revision, per §63.8(d)(3) • Reduce CEMS data, which should be computed from four or more equally spaced 	<ul style="list-style-type: none"> • Notify DENR at least 60 days prior to conducting performance evaluations of CEMS, per §63.8(e)(2) • Submit site-specific CEMS performance evaluation test plan at least 60 days before the performance test, per §63.8(e)(3) • Submit CEMS performance evaluation results within 60 days of completion of the evaluation, per §63.8(e)(5) • Submit information concerning all CMS out-of-

Table 3-8. Compliance Plan for 40 CFR 63 Subpart A – General Provisions

			<p>in §63.8(b)(2)-(3)</p> <ul style="list-style-type: none"> • Maintain monitoring system in manner consistent with good air pollution control practices, per §63.8(c)(1) • Maintain and operate CMSs as specified in §§63.6(e)(1), per 63.8(c)(1)(i) • Maintain supply of necessary parts for routine repair of CMSs, per §63.8(c)(1)(ii) • Develop and implement SSM Plan for CMSs, per §63.8(c)(1)(iii) 	<p>data points in each 1-hour period, as specified in §63.8(g)</p> <ul style="list-style-type: none"> • Maintain records of each period during which a CMS is malfunctioning or inoperative (including out-of-control periods), all calibration checks, and all adjustments and maintenance performed on CMS, per §§63.10(b)(vi), (x), and (xi) 	<p>control periods in the excess emissions and CMS performance report required in §§63.10(e)(3), per 63.8(c)(8)</p> <ul style="list-style-type: none"> • Request to use alternative monitoring procedures at least 60 days prior to performance evaluation following procedures in §63.8(f)(4) • Request to use an alternative test method for determining relative accuracy following procedures in §63.8(f)(6)
<p>40 CFR 63, Subpart A NDAC 33-15-22 (Continued from previous page)</p>	<p>002, 003, 004</p>	<p>N/A</p>	<ul style="list-style-type: none"> • CMSs must be installed to get representative emission and parameter measurements, per §63.8(c)(2) • CMSs must verify operational status prior to or during performance tests, per §63.8(c)(3) • CMSs must be operating at all times except during breakdown, out-of-control, repair, maintenance, and high-level calibration drifts, per §63.8(c)(4) • CEMS must have minimum of one cycle of operation for each successive 15-minute period, per §63.8(c)(4)(ii) • CMS must do daily zero and high-level calibrations, per 	<ul style="list-style-type: none"> • Maintain records of all emission levels relative to the criterion for obtaining permission to use an alternative to the relative accuracy test, if source granted permission under §63.8(f)(6), per §63.10(b)(2)(xiii) • Maintain records of all required CMS measurements and other information, per §§63.10(c)(1), (5), (6), and (10)-(15) • Per Table 10 to Subpart DDDDD, §§63.10(c)(7) and (8) do not apply to the CMS installed on the boilers 	<ul style="list-style-type: none"> • Submit additional notifications associated with CMS as specified in §§63.9(g)(1) and (g)(3) • Report results obtained from each installed CEMS, per §63.10(e)(1) • Submit a written copy of the CMS performance evaluation simultaneously with the results of the performance test(s) required under §§63.8(e), per 63.10(e)(2)(i) • Per Table 10 of Subpart DDDDD, the requirements for the excess emissions and CMS performance report and summary report in §63.10(e)(3) do not apply

Table 3-8. Compliance Plan for 40 CFR 63 Subpart A – General Provisions

			<p>§63.8(c)(6)</p> <ul style="list-style-type: none"> • CMS is out of control if meets criteria in §§63.8(c)(7)(i); when CMS out of control, take corrective actions and repeat tests per 63.8(c)(7)(ii) • Develop and implement a CMS quality control program, per §63.8(d)(1)-(2) 		
40 CFR 63, Subpart A NDAC 33-15-22 (Continued from previous page)	014	N/A	<ul style="list-style-type: none"> • Conduct a performance evaluation of CEMS when required by relevant standard, per §63.8(e) 	See previous page	See previous page
40 CFR 63, Subpart A NDAC 33-15-22	015, 018	N/A	Per §§63.6590(b)(1)(i), emergency stationary reciprocating internal combustion engines (RICE) do not have to meet the requirements of Subpart ZZZZ and Subpart A except for the initial notification requirements of 63.6645(d).	N/A	Initial notification shall be submitted and include a statement that the stationary RICE in question has no additional requirements based on the exclusion for emergency stationary RICE, per §§63.6645(d). In addition, the notification shall include the information in 63.9(b)(2)(i) through (v).
40 CFR 63, Subpart A NDAC 33-15-22	016	N/A	<p>Per Table 1 to Subpart Q, the following sections do not apply to industrial process cooling towers:</p> <ul style="list-style-type: none"> • §63.3 • §63.5 • §§63.6(d), (e), (f), (g), (h), and (i) • §63.7 	<ul style="list-style-type: none"> • Records retained for at least 5 years following the date of each occurrence, measurement, maintenance, corrective action, report, or record, per §63.10(b)(1). Records must be retained onsite for the full 5 years, per §63.406. 	<ul style="list-style-type: none"> • Per Table 1 to Subpart Q, 40 CFR 63.5 does not apply to industrial process cooling towers • Submit initial notifications specified in §63.9(b)(1) and (b)(3), per Table 1 to Subpart Q • Submit Notifications of Compliance Status

Table 3-8. Compliance Plan for 40 CFR 63 Subpart A – General Provisions

			<ul style="list-style-type: none"> • §63.8 • §§63.9(b)(2), (b)(4), (b)(5), (b)(6), (d), (e), (f), (g), (h)(2), (h)(4), and (h)(5) • §§63.10(b)(2)(i) to (xi), (c), and (e) • §63.11 		<p>containing the information specified within §§63.9(h)(1), (h)(3), and (h)(6), per Table 12 of Subpart FFFF</p> <ul style="list-style-type: none"> • Any change in the information already provided under §63.9 shall be submitted to the NDDH in writing within 15 calendar days of making the change, per §63.9(j) • Submit periodic and immediate startup, shutdown, and malfunction reports as specified in §63.10(d)(5)
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Table 3-9. Compliance Plan for 40 CFR 63, Subpart B – Requirements for Control Technology Determinations for Major Sources in Accordance with Clean Air Act Sections 112(g) and (j)

Citation	EPN	Emission Limit	Monitoring & Testing	Recordkeeping	Notifications & Reporting
40 CFR 63.42(c)	002 – 011	<p>(c) Prohibition. After the effective date of section 112(g)(2)(B) (as defined in §63.41) in a State or local jurisdiction and the effective date of the title V permit program applicable to that State or local jurisdiction, no person may begin actual construction or reconstruction of a major source of HAP in such State or local jurisdiction unless:</p> <p>(1) The major source in question has been specifically regulated or exempted from regulation under a standard issued pursuant to section 112(d), section 112(h) or section 112(j) in part 63, and the owner and operator has fully complied with all procedures and requirements for preconstruction review established by that standard, including any applicable requirements set forth in subpart A of this part 63; or</p> <p>(2) The permitting authority has made a final and effective case-by-case determination pursuant to the provisions of §63.43 such that emissions from the constructed or reconstructed major source will be controlled to a level no less stringent than the maximum achievable control technology emission limitation for new sources.</p>			
40 CFR 63, Subpart B 40 CFR 63.43(d) NDAC 33-15-22	002 - 011	0.005 gr/dscf per Spiritwood Station determination	<ul style="list-style-type: none"> • Conduct initial performance tests within 180 days of the compliance date listed within each applicable Subpart, per §63.7(a) • Performance tests conducted as specified unless a waiver is granted by the NDDH per §63.7(h) 	Per General Provisions	Per General Provisions

Table 3-10. Compliance Plan for MACT Subpart Q – Industrial Process Cooling Towers

Citation	EPN	Emission Limit	Monitoring & Testing	Recordkeeping	Notifications & Reporting
40 CFR 63, Subpart Q NDAC 33-15-22	016	Use no chromium - based water treatment chemicals	<ul style="list-style-type: none"> • No routine monitoring, sampling, or analysis is required, per §63.404 • NDDH can request a cooling water sample analysis at any time, per §63.404 	<ul style="list-style-type: none"> • Maintain copies of the initial notification and the notification of compliance status as required by §§63.405 for a period of at least 5 years onsite, per 63.406 	<ul style="list-style-type: none"> • Submit initial startup notification within 12 months after initial startup, per §§63.405(a)(2) and 63.9(b) • Submit notification of compliance status within 60 days of startup, per §§63.405(b) and 63.9(h)

Table 3-11. Compliance Plan for 40 CFR 63, Subpart DDDDD – Industrial/Commercial/Institutional Boilers and Process Heaters

Citation	EPN	Emission Limit	Monitoring & Testing	Recordkeeping	Notifications & Reporting
40 CFR Section 63.7495(a), (d)	014		New sources must comply with standard upon startup. Note: The CFB boiler (EUI-1), as a coal-fired electric utility unit, is not subject to Subpart DDDDD.		Submit notification of requirements in 63.7545 per schedule noted in 63.7545
40 CFR Section 63.7500 (1) Emission limits for large liquid fired units	014	0.03 lb/MMBtu PM, 0.0005 lb/MMBtu HCl, ≤400 ppm CO on a dry basis corrected to 3% oxygen using 30-day Rolling Average			
40 CFR Section 63.7500 (1) Emission limits for large gas-fired units	014	≤400 ppm CO on a dry basis corrected to 3% oxygen using 30-day Rolling Average			
40 CFR Section 63.7525 (b) For unlimited large liquid fuel units	014		Install, operate, certify and maintain each continuous opacity monitoring system (COMS) according to the procedures in paragraphs (b)(1) through (7) of this section by the compliance date specified in §63.7495.		

Table 3-11. Compliance Plan for 40 CFR 63, Subpart DDDDD – Industrial/Commercial/Institutional Boilers and Process Heaters

Citation	EPN	Emission Limit	Monitoring & Testing	Recordkeeping	Notifications & Reporting
40 CFR Section 63.7505(a), (b)	014		Comply with emission limits and work practice standard except during startup, shutdown and malfunction; Operate equipment, control equipment and monitoring equipment per 63.6(e)(1)(i)		
40 CFR Section 63.7505(e)	014				Prepare and implement SSMP per 63.6(e)(3)
40 CFR Section 63.7525(a)	014		Install and operate a CO CEMs. Must be operational at startup. Install and conduct performance evaluation per NSPS App B PS-4A. One sample per 15 min period. Reduce data per 63.8(g)(2).	Calculate and record 30 day average CO concentration. Do not include periods of CEM malfunction/repair and periods of boiler operation at < 50% of MCR* in 30 day average	
40 CFR Section 63.7530(e)	014				Submit Notification of Compliance Status report per 63.7545(e)
40 CFR Section 63.7540(a)(10)	014		Continuously monitor CO, Meet standard at all times except startup, shutdown or malfunction or when boiler is at less than 50% of MCR*. Keep records of CO monitoring per 63.7555(b)		
40 CFR Section 63.7540(b)	014				Report each instance when CO limit is exceeded per 63.7550, This includes periods of SSM
40 CFR Section 63.7540(c)	014		During periods of SSM operate in accordance with SSMP		
40 CFR Section 63.7540(d)	014		Deviations which occur during SSM are not violations if following the SSMP		

Table 3-11. Compliance Plan for 40 CFR 63, Subpart DDDDD – Industrial/Commercial/Institutional Boilers and Process Heaters

Citation	EPN	Emission Limit	Monitoring & Testing	Recordkeeping	Notifications & Reporting
40 CFR Section 63.7545 (c)	014				Initial startup notification within 120 days of start of operation.
40 CFR Section 63.9	014				Initial CEM startup notification within 120 days of start of operation
40 CFR Section 63.7545 (d) 40 CFR Section 63.9 (9)(1)	014				Notification of intent to conduct a performance test at least 30 days before scheduled test date. Submit simultaneously the notification of the date the CMS performance evaluation is scheduled to begin.
40 CFR Section 63.7545 (e)	014				Notification of Compliance Status 60 calendar days following completion of the performance test and/or compliance demonstration. Include description of source and classification, summary of performance tests an applicable operating limits, ID if comply by performance test, certify compliance, Summary of CO date from performance test. Any deviations that occurred and corrective actions taken.
40 CFR Section 63.7550 (b)(2),(3)(4) & (5)	014				First report due after 7/31 or 1/31 following the calendar half in which the specified compliance date occurs. Semi-annual compliance/deviation report due semiannually by July 31 and January 31. Submit following report semiannually. Reports may be filed per schedule established in Title V permit.

Table 3-11. Compliance Plan for 40 CFR 63, Subpart DDDDD – Industrial/Commercial/Institutional Boilers and Process Heaters

Citation	EPN	Emission Limit	Monitoring & Testing	Recordkeeping	Notifications & Reporting
40 CFR Section 63.7550 (c)	014				Report content. Company name and address, certification of compliance, period of report, summary of performance tests, hours of operation per calendar month, if SSM occurred - actions taken per the SSMP plan, if no deviations include statement to that effect , if no CMS out of control periods- include statement to that effect.
40 CFR Section 63.7550 (d)	014				Report content if deviations occur: total hrs of operation, description of deviation and associated limit, information on the number, cause and corrective actions taken
40 CFR Section 63.7550 (e)	014				Report content for standards monitored by CMS: Date/Time of malfunctions. Date/Time CMS inoperative, Date/Time CMS out of control. Date/Time of malfunctions deviations. Summary of total duration of deviations & total operating time, and breakdown of when deviations occurred (SSM etc). Summary of CMS downtime. ID each parameter monitored where deviations occurred. Description of source where deviation occurred and CMS used. Date of last CMS certification. Any changes to the CMS since the last report for which there was a deviation.

Table 3-11. Compliance Plan for 40 CFR 63, Subpart DDDDD – Industrial/Commercial/Institutional Boilers and Process Heaters					
Citation	EPN	Emission Limit	Monitoring & Testing	Recordkeeping	Notifications & Reporting
40 CFR Section 63.7550 (f)	Facility				Sources with Title V permits must report per reference requirements in 70.6(a)(3)(iii)
40 CFR Section 63.7550 (g)	014				If using alternative fuel in gas fired boiler due to gas curtailment; submit report within 48 hrs.
40 CFR Section 63.7555 (a)	014				Initial notifications, all other reports, testing and compliance data (Including SSM information) will be held for five years
40 CFR Section 63.7555 (b)	014			For CMS's – performance evaluation plans, requests for alternative RA tests, deviation and SSM dates and times	
40 CFR Section 63.7555 (d)	014			Monthly fuel type and use, and hours of operation	
40 CFR Section 63.7565	014			Keep records for 5 years. Maintain records on site for 2 years.	

Table 3.12. Compliance Plan for Acid Rain Program					
Citation	EPN	Emission Limit	Monitoring & Testing	Recordkeeping	Notifications & Reporting
40 CFR Part 72.6 Applicability	001	(a) Each of the following units shall be an affected unit, and any source that includes such a unit shall be an affected source, subject to the requirements of the Acid Rain Program: (3) A utility unit, except a unit under paragraph (b) of this section, that: (i) Is a new unit			N/A
40 CFR Part 72.9	001	(2) The owners and operators of	(1) The owners and		(1) The designated

Table 3.12. Compliance Plan for Acid Rain Program

<p>(a) Permit Requirements. (b) Monitoring requirements</p>		<p>each affected source and each affected unit at the source shall: (i) Operate the unit in compliance with a complete Acid Rain permit application or a superseding Acid Rain permit issued by the permitting authority; and (ii) Have an Acid Rain Permit.</p>	<p>operators and, to the extent applicable, designated representative of each affected source and each affected unit at the source shall comply with the monitoring requirements as provided in part 75 of this chapter.</p>		<p>representative of each affected source and each affected unit at the source shall: (i) Submit a complete Acid Rain permit application (including a compliance plan) under this part in accordance with the deadlines specified in §72.30</p>
<p>40 CFR Part 72.9 (c) Sulfur dioxide Requirements.</p>	<p>001</p>	<p>(1) The owners and operators of each source and each affected unit at the source shall: (i) Hold allowances, as of the allowance transfer deadline, in the unit's compliance subaccount (after deductions under §73.34(c) of this chapter) not less than the total annual emissions of sulfur dioxide for the previous calendar year from the unit; and (ii) Comply with the applicable Acid Rain emissions limitation for sulfur dioxide. (2) Each ton of sulfur dioxide emitted in excess of the Acid Rain emissions limitations for sulfur dioxide shall constitute a separate violation of the Act. (3) An affected unit shall be subject to the requirements under paragraph (c)(1) of this section as follows: (iv) starting on the later of January 1, 2000 or the deadline for monitor certification under part 75 of this chapter, an affected unit under §72.6(a)(3) that is not a substitution or compensating unit. (4) Allowances shall be held in, deducted from, or transferred among Allowance Tracking System accounts in accordance with the Acid Rain Program. (5) An allowance shall not be deducted, in order to comply with the requirements under paragraph (c)(1)(i) of this section, prior to the calendar year for which the allowance was allocated. (6) An allowance allocated by the Administrator under the Acid Rain Program is a limited authorization to emit sulfur dioxide in accordance with the Acid Rain Program. No provision of the Acid Rain Program, the Acid Rain permit application, the Acid Rain permit, or an exemption under §§72.7, 72.8, or 72.14 and no provision of law shall be construed to limit the authority of the United States to terminate or limit such authorization. (7) An allowance allocated by the Administrator under the Acid Rain Program does not constitute a property right.</p>			
<p>40 CFR Part 72.9 (d) Nitrogen Oxides Requirements</p>	<p>001</p>	<p>The owners and operators of the source and each affected unit at the source shall comply with the applicable Acid Rain emissions limitation for nitrogen oxides.</p>			
<p>40 CFR Part 72.9 (e) Excess Emissions Requirements</p>	<p>001</p>	<p>(1) The designated representative of an affected unit that has excess emissions in any calendar year shall submit a proposed offset plan, as required under part 77 of this chapter. (2) The owners and operators of an affected unit that has excess emissions in any calendar year shall: (i) Pay without demand the penalty required, and pay upon demand the interest on that penalty, as required by part 77 of this chapter; and (ii) Comply with the terms of an approved offset plan, as required by part 77 of this chapter.</p>			

Table 3.12. Compliance Plan for Acid Rain Program

<p>40 CFR Part 72.9 (f) Recordkeeping and Reporting Requirements</p>	<p>001</p>			<p>(1) keep on site at the source each of the following documents for a period of 5 years: (i) The certificate of representation for the designated representative for the source and each affected unit at the source. (ii) All emissions monitoring information (Part 75), unless Part 75 provides for a 3-year period: (iii) Copies of all reports, compliance certifications, and other submissions and all records made or required. (iv) Copies of all documents used to complete an Acid Rain permit application and any other submission under the Acid Rain Program or to demonstrate compliance with the requirements of the Acid Rain Program. (2) The designated representative of an affected source and each affected unit at the source shall submit the reports and compliance certifications required under the Acid Rain Program, including those under subpart I of this part and part 75 of this chapter.</p>
<p>40 CFR 72.20 Authorization and responsibilities of the designated representative.</p>	<p>001</p>	<p>(a) each affected source shall have one and only one designated representative (or ADR), with regard to all matters under the Acid Rain Program. (b)The owners and operators shall be bound by any order issued to the designated representative by the Administrator, the permitting authority, or a court. (c) The designated representative shall be selected and act in accordance with the certifications set forth in §72.24(a) (4), (5), (7), and (9). (d) No Acid Rain permit shall be issued to an affected source, nor shall any allowance transfer be recorded for an Allowance Tracking System account of an affected unit at a source, until the Administrator has received a complete certificate of representation for the designated representative of the source and the affected units at the source.</p>		
<p>40 CFR 72.21 Acid Rain Program Submissions by the designated representative.</p>	<p>001</p>			<p>(a) Each submission under the Acid Rain Program shall be submitted, signed, and certified by the designated representative (b) In each submission under the Acid Rain Program, the designated representative shall certify, by his or her signature: [the statements in b(1) - b(2)]</p>
<p>40 CFR 72.30 Acid Rain Permit Application. Requirements to</p>	<p>001</p>	<p>(a) Duty to apply. The designated representative of any source with an affected unit shall submit a complete Acid Rain permit application by the applicable deadline in paragraphs (b) and (c) of this section, and the owners and operators of such source and any affected unit at the source shall not operate the source or unit without a permit that states its Acid Rain program requirements.</p>		

Table 3.12. Compliance Plan for Acid Rain Program		
apply.		<p>(b)(2)(ii) ..[deadline] at least 24 months before the later of January 1, 2000 or the date on which the unit commences operation.</p> <p>(d) ...The original and three copies of all permit applications for Phase II, where the Administrator is not the permitting authority, shall be submitted to the State permitting authority for the State where the affected source is located. (Draft Acid Rain Permit Application is provided in Appendix 7. The application will be submitted upon completion of Certificate of Representation process)</p>

Table 3-13. Compliance Plan for NDAC Visible Emissions Limits					
Citation	EPN	Emission Limit	Monitoring & Testing	Recordkeeping	Notifications & Reporting
NDAC 33-15-03-02	001- 018	Opacity: 20%; 40% for one 6-minute period per hour	<ul style="list-style-type: none"> Method 9 of 40 CFR 60, Appendix A to be used for initial opacity observations, per NDAC 33-15-03-05 	<ul style="list-style-type: none"> Data recorded as 6-minute averages Record results of all visible emissions observations and any corrective actions taken Maintain records for 5 years 	N/A

3.2 Compliance Demonstration for Other Applicable Requirements

As detailed in Section 2.0 of this permit application, Spiritwood Station is subject to Federal and State regulations that impose emission standards and operational limits. The following sections detail the applicable requirements and Spiritwood Station's compliance demonstration.

3.2.1 Opacity Limits (NDAC 33-15-03 and 33-15-12)

The Spiritwood Station emission units will not exceed the following opacity limits:

1. Point sources: 20 percent, except that a maximum of 40% is permissible for not more than one six-minute period per hour. This standard applies at all times, except as allowed by NDAC 33-15-03-04. If NSPS requirements are more restrictive, the NSPS prevails.
2. Fugitive emissions: Spiritwood Station shall not discharge into the ambient air any air contaminant which exhibits opacity greater than 40% for more than one six-minute period per hour. Such visible emissions shall have been visibly transported off the property of emission origination and remain visible to an observer positioned off-site when sighting along a line that does not cross the property of emission origination.

3.2.2 Odor Limit (NDAC 33-15-16)

Spiritwood Station will not discharge into the atmosphere any objectionable odorous contaminant that measures seven odor concentration units or more. Compliance shall be determined in accordance with NDAC 33-15-16 as required by the NDDH. Compliance shall be assumed during all times that the plant is in operation.

3.2.3 Prohibition of Air Pollution (NDAC 33-15-01-15 and 33-15-17-01.2)

Spiritwood Station will not permit or cause air pollution, as defined in Section 33-15-01-04 of the NDAC.

3.2.4 Pumps and Compressors (NDAC 33-15-07-01.5)

All rotating pumps and compressors handling volatile organic compounds must be equipped and operated with properly maintained seals designed for their specific product service and operating condition.

3.2.5 Vehicle and Internal Combustion Engines (NDAC 33-15-08.01)

Spiritwood Station will not operate, or cause to be operated, any internal combustion engine which emits from any source any unreasonable and excessive smoke, obnoxious or noxious gases, fumes or vapor.

3.2.6 Air Pollution Emergency Episodes (NDAC 33-15-11)

When the Department declares an air pollution emergency episode, Spiritwood Station will comply with the requirements in NDAC 33-15-11 of North Dakota Air Pollution Control Rules. If requested by the Department, Spiritwood Station will prepare an air pollution abatement strategy in accordance with NDAC 33-15-11-04.

3.2.7 Chemical Accident Prevention (40 CFR 68)

Spiritwood Station will comply with all applicable requirements of Chemical Accident Prevention pursuant to 40 CFR 68. Spiritwood Station will comply with the requirements of this part no later than the latest of the following dates:

- a. Three years after the date on which a regulated substance is first listed under 40 CFR 68;
or
- b. The date on which a regulated substance is first present above a threshold quantity in a process.

3.2.8 Emissions Testing (NDAC 33-15-12 and 33-15-14-02.9.b)

1. Initial Testing: Within 60 days after achieving the maximum production rate at the plant, but not later than 180 days after startup; Spiritwood Station will conduct emissions tests using an independent testing firm, to determine the compliance status of the facility with respect to the emission rates specified in Table 3-2 above.
2. Notification: Spiritwood Station will notify the Department using the form in the Emission Testing Guideline, or its equivalent, at least 30 calendar days in advance of any tests of emissions of air contaminants required by the Department. If Spiritwood Station is unable to conduct the performance test on the scheduled date, Spiritwood Station will notify the Department at least five days prior to the scheduled test date, or as soon as practicable, and coordinate a new test date with the department.
3. Sampling Ports/Access: Sampling ports will be provided downstream of all emission control devices and in a flue, conduit, duct, stack, or chimney arranged to conduct emissions to the ambient air. The ports will be located to allow for reliable sampling and will be adequate for test methods applicable to the facility. Safe sampling platforms and safe access to the platforms will be provided. Plans and specifications showing the size and location of the ports, platform and utilities will be submitted to the Department for review and approval.

4. Other testing:

- a. Spiritwood Station understands that the Department may require having tests conducted to determine the emission of air contaminants from any source, whenever the Department has reason to believe that an emission of a contaminant not addressed by Spiritwood Station is occurring, or the emission of a contaminant in excess of that allowed by this permit is occurring. The Department may specify testing methods to be used in accordance with good professional practice. The Department may observe the testing. All tests shall be conducted by reputable, qualified personnel. The Department shall be given a copy of the test results in writing and signed by the person responsible for the tests. All tests shall be made and the results calculated in accordance with test procedures approved by the Department. All tests shall be made under the direction of persons qualified by training or experience in the field of air pollution control as approved by the Department.
- b. Spiritwood Station understands that the Department may conduct tests of emissions of air contaminants from any source. Upon request of the Department, Spiritwood Station will provide necessary ports in stacks or ducts and such other safe and proper sampling and testing facilities, exclusive of instruments and sensing devices, as may be necessary for proper determination of the emission of air contaminants.

3.2.9 Emissions Monitoring (NDAC 33-15-14-02.9.a)

Spiritwood Station will observe the emission points at least once during each week in which the emission unit is operated to determine if visible emissions are present. If no visible emissions are present, the permittee shall record the date, time and observation results. If the observation indicates visible emissions are present, the permittee must investigate the problem within eight hours. Any malfunctions shall be corrected as soon as practicable. All investigations of malfunctions shall be recorded.

3.2.10 Shutdown/Malfunction and/or Deviation from Permit Requirements (NDAC 33-15-01-13.2)

When a malfunction in any installation or deviation from permit requirements occurs that can be expected to last longer than 24-hours and cause the emission of air contaminants in violation of this permit or any other applicable rules and regulations, Spiritwood Station will notify the Department of such malfunction or deviation from permit requirements as soon as possible during normal working hours. The notification must contain a statement giving all pertinent facts, including the estimated

duration of the breakdown, if applicable. The Department shall be notified when the condition causing the malfunction has been corrected.

3.2.11 Recordkeeping (NDAC 33-15-12 and 33-15-14-02.9.d)

All records required by this permit will be kept on file at the Spiritwood Station facility for a period of five years. The records will be available for inspection by Department personnel and will be submitted to the Department upon request. The following records will be maintained:

- a. All stack tests results including field data, laboratory analysis data, and quality assurance data.
- b. All continuous monitoring data required by this permit.
- c. The results of all visible emissions observations and any corrective actions taken.
- d. Limestone and lime addition information for SO₂ control.
- e. Fuel sulfur certification (Package boiler fuel and diesel engine fuel)

3.2.12 Fees (NDAC 33-15-23)

Spiritwood Station will pay fees in accordance with NDCC 23-25 and NDAC 33-15-23.

3.2.13 Annual Emission Inventory Reports (NDAC 33-15-14-02.9.d)

Annual emission inventory reports including, but not limited to, process information regarding the amount and type of air contaminants emitted, production rates and hours of operation, will be submitted to the Department, on forms supplied by the Department. This report will be submitted to the Department by March 15 of each calendar year.

3.2.14 General Conditions to be Included in Permit to Construct

1. Spiritwood Station will comply with all State and Federal environmental laws and rules. In addition, Spiritwood Station will comply with all local building, fire, zoning, and other applicable ordinances, codes, rules and regulations.
2. Construction of the Spiritwood Station facility will be in accordance with information provided in the permit application as well as any plans, specifications and supporting data submitted to the NDDH. The NDDH will be notified ten days in advance of any significant

deviations from the permit application as well as any plans, specifications or supporting data furnished.

3. All reasonable precautions will be taken by Spiritwood Station to prevent and/or minimize fugitive emissions during the construction period.
4. Spiritwood Station will submit a notification of the anticipated date of initial startup of the facility to the NDDH not more than 60 days nor less than 15 days prior to such date. A notification of the actual date of initial startup shall be submitted within 15 days after such date.
5. Spiritwood Station understands that any duly authorized officer, employee or agent of the North Dakota NDDH of Health may enter and inspect any property, premise or place at which Spiritwood Station is or will be located at any time for the purpose of ascertaining the state of compliance with the North Dakota Air Pollution Control Rules and the conditions of this permit.
6. Spiritwood Station understands that any violation of a condition issued as part of this Permit to Construct as well as any construction which proceeds in variance with any information submitted in the application, is regarded as a potential violation of construction authority and is subject to enforcement action.
7. Spiritwood Station understands that the Permit to Construct will become invalid if construction is not commenced within eighteen months after receipt of such permit, if construction is discontinued for a period of eighteen months or more; or if construction is not completed within a reasonable time.
8. Spiritwood Station understands that the Permit to Construct is issued in reliance upon the accuracy and completeness of the information set forth in the application. Notwithstanding the tentative nature of this information, the conditions of this permit herein become, upon the effective date of this permit, enforceable by the NDDH pursuant to any remedies it now has or may have in the future, under the North Dakota Air Pollution Control Law, NDCC Chapter 23-25. Each and every condition of this permit is a material part thereof, and is not severable.
9. Spiritwood Station understands that the Permit to Construct may not be transferred without prior approval from the NDDH.

4.0 State Air Toxics Analysis

The North Dakota state air toxics policy is used to determine the health-related risks represented by proposed new emissions of hazardous air pollutants (HAPs). In order to determine compliance with the NDDH “*Policy for the Control of Hazardous Air Pollutant Emissions in North Dakota*”, dispersion modeling is used to determine the maximum off-property, ground-level ambient concentration of each HAP emitted. HAP emissions are classified into one of three categories: (1) known human carcinogens, (2) suspected or reasonably anticipated human carcinogen, and (3) noncarcinogen or substance lacking sufficient data to determine carcinogenicity. These classifications are identified as Group 1, Group 2, and Group 3 HAP emissions, respectively. The NDDH recommends a three-tiered approach of decreasing conservatism to calculate the maximum off-property, ground-level ambient concentration of each HAP. Three tiers of analyses are not required if compliance with the Maximum Individual Carcinogenic Risk (MICR) and Maximum Acceptable Ambient Levels (MAAL) can be shown through Tier I and/or II. A copy of the NDDH “*Policy for the Control of Hazardous Air Pollutant Emissions in North Dakota*” is included in Appendix D.

The Spiritwood Station and Spirit Ethanol plants are adjacent to each other and have property lines that abut on the west side of the CHP plant and the east side of the ethanol plant. Each plant is distinct in physical location and an air toxics analysis has been prepared for each facility within its respective air permit application. A Tier III analysis has been completed for the Spiritwood Station air toxics analysis. The specifics of this analysis are summarized in the following sections.

4.1 Tier III Analysis for Group 3 HAPs

Group 3 HAPs are non carcinogenic toxics or toxics that lack sufficient information to determine carcinogenicity. The Hazard Index, determined from one and eight hour maximum acceptable ambient levels (MAALs), in aggregate must not exceed 1.0. A refined EPA computer model, ISC-PRIME, was used to determine the 1-hour and 8-hour concentrations of each Group 3 HAP emitted by Spiritwood Station at all public receptors within five kilometers of the plant. A map showing these receptors with respect to the Spiritwood Station plant is included in Appendix D, Figure D-1. In brief, they include receptors located outside the property of Spiritwood Station and the Cargill Malt plant. These receptors are the same as those used for all PSD modeling.

The highest modeled 1-hour and 8-hour concentrations in $\mu\text{g}/\text{m}^3$ were divided by 1,000 to provide the concentration in milligrams per cubic meter (mg/m^3). These concentrations were used to determine individual pollutant 1-hour and 8-hour Hazard Indexes. The overall Hazard Index is the sum of the greater of the 1-hour or 8-hour individual Hazard Index for each pollutant. These calculations are as follows:

$$\text{Hazard Index} = \text{SUM} [\text{greater of 1-hour or 8-hour individual Hazard Index}]$$

$$\text{1-hour individual Hazard Index} = \text{1-hour concentration (mg/m}^3\text{)} / \text{1-hour MAAL (mg/m}^3\text{)}$$

$$\text{8-hour individual Hazard Index} = \text{8-hour concentration (mg/m}^3\text{)} / \text{8-hour MAAL (mg/m}^3\text{)}$$

A detailed listing of the HAP emissions is provided in Appendix D, Table D-1.

4.2 Tier III Analysis for Group 1 and 2 HAPs

As previously stated, Group 1 and 2 HAPs are known, suspected or reasonably anticipated human carcinogens. The maximum individual carcinogenic risk (MICR) allowed from an affected HAP source is 1 E^{-6} . A refined EPA computer model, ISC-PRIME, was used to determine the maximum annual concentrations of each Group 1 and 2 HAP emitted by Spiritwood Station within five kilometers of the plant. A map showing these receptors with respect to the Spiritwood Station is included in Appendix D as Figure D-1; these receptors are the same receptors that were used for prevention of significant deterioration (PSD) modeling. The inputs to ISC-PRIME included the potential emissions of each pollutant at each stack. These potentials were calculated using AP-42 factors with the exception of hexavalent chromium (Cr[VI]). The calculation of Cr[VI] potential emissions is discussed below.

The maximum annual concentration among all receptors evaluated was used to determine the maximum individual carcinogenic risk (MICR) for each Group 1 and 2 pollutant separately, which are summed together for a total MICR. These calculations are as follows:

$$\text{Individual MICR} = \text{Maximum Annual Concentration (mg/m}^3\text{)} * \text{Unit Risk Factor (m}^3/\mu\text{g)} * 1000 \mu\text{g/mg}$$

$$\text{Total MICR} = \text{SUM} [\text{Individual Pollutant MICR}] * 30/70 \text{ occupancy factor}$$

There are two ways to use determine total MICR.

1. The first approach uses the maximum concentration of each pollutant at any receptor to determine the risk associated with that pollutant. These individual pollutant risks are summed to determine a total MICR. This approach assumes that the maximum concentration of all species occurs at the same receptor; however, the location of this theoretical maximum receptor cannot be specifically identified on the grid as it is a composite of many points. This is the method that is used to calculate the MICR values that have been reported previously and are cited in this application.
2. The second approach calculates the total MICR at every receptor as the sum of the individual pollutant risks that result from the modeled concentrations at that specific receptor. This method allows for a geographic comparison of risk (in a figure) and is the methodology used to calculate the MICRs presented in Figure D-2.

The second method is more intuitive as any individual is usually located at only one location; however, the first method is more conservative as the maximum concentration of all pollutants rarely occurs at the same receptor.

It should be noted that the complete grid includes receptors that are on property owned by Cargill Malt. The Cargill property includes the section on which Cargill is located and Spiritwood Station will be located and the section immediately to the south, not including a cemetery in the southwest corner of the north section and a parcel at the north end of the north section, which is residential. From a practical point of view, nobody will establish a residence within Cargill's property during the life of the power plant and malting facility. Thus, in the MICR calculations, only HAP concentrations off Cargill property were considered. Cargill's property line and the modeled receptor grid are shown in Figure D-2.

A 30/70 occupancy factor is applied to the modeled results to represent the fact that only 30 of 70 years of an average lifetime will be spent in any given location. The locations of high MICR with the occupancy factor are shown in Figure D-2 (calculation approach 2). As shown in Figure D-2, all receptors outside of Cargill's property have an MICR less than 1×10^{-6} . The offsite concentration of each chemical, the risk factor and the ensuing individual chemical risk is shown in Table D-4 in Appendix D. There are receptors on Cargill's property that exceed the 1×10^{-6} MICR limit, mainly on or around the lagoons to the south of the Cargill plant, but during the life of the facilities, no residences would be built at any of these onsite receptors.

4.2.1 Potential Emissions of Hexavalent Chromium

Chromium is emitted in two oxidation states, Cr[III] and Cr[VI]. Cr[III] is the thermodynamically preferred oxidation state and is the assumed oxidation state when none is specified (i.e. Cr). Cr is considered a non-carcinogenic toxic and is included in the Group 3 analysis. Cr[VI], however, is a carcinogen and generally only found in combustion emissions. For toxic metal emissions, the AP-42 emission factors for lignite combustion all have an emission factor rating of “A”, except for Cr[VI], which has an emission factor of “D”. The “A” rating indicates excellent quality and the “D” rating indicates below average quality for the emission factor.

In 1998, the EPA presented a study of hazardous air pollutant emissions from coal-fired electric generating units to Congress. The study included speciation data for chromium,¹⁴ which indicated that Cr[VI] accounted for 11% of the total chromium emissions from coal combustion. Because the emission factor quality rating for Cr[VI] was poor compared to that of Cr, Cr[VI] emissions were estimated by using the high quality AP-42 emission factor for Cr and applying the 11% factor determined by the EPA study to that value.

4.2.2 Nature of Arsenic Emissions Leads to Conservative Risk Values

Due to the treatment of arsenic in the emission calculations, the total calculated MICR for Spiritwood Station is a conservative assessment of the overall risk from carcinogens. The contribution of arsenic to the total MICR is 0.54 E-6 out of 1.0 E-6 suggesting that it is the main risk driver. However, the calculated risk from arsenic is a very conservative value due to the basis for the risk factor and the nature of the arsenic emissions at Spiritwood Station.

There are two oxidation states of arsenic present in most arsenic emissions: As[III] (arsenite or arsenic trioxide) and As[V] (arsenate). Generally, As[III] is recognized as the more toxic form of arsenic and is the form of arsenic on which the EPA IRIS risk factor is based.¹⁵ The NDDH risk factor is the same as the EPA IRIS risk factor. A separate risk factor for As[V] is not available, so risk due to all arsenic is generally based on the risk factor from epidemiology studies related to

¹⁴ “Study of Hazardous Air Pollutant Emissions from Electric Utility Generating Units”, Final Report to Congress. EPA 453/R-98-004a, 1998. Volumes 1 and 2.

¹⁵ “A New Method for the Analysis of Cohort Studies: Implications of the Multistage Theory of Carcinogenesis Applied to Occupational Arsenic Exposure.” C.C. Brown and K.C Chu, *Environmental Health Perspectives*, 1983, Vol. 50, pp. 284-308.

As[III]. However, the arsenic in coal and coal combustion products is predominantly As[V]¹⁶ and the California Air Resources Board (CARB) reports ratios of As[III] to As[V] of 1.0-1.2 from high temperature sources.¹⁷ Thus, using the CARB information as the more conservative data, it is likely that half of the arsenic emissions from Spiritwood Station are emitted as the less toxic form, As[V], and the risk contribution from arsenic is therefore overstated. For this reason, and because arsenic in general is the major risk driver for Group 1 and 2 HAPs, the overall MICR may be viewed as a conservative evaluation.

4.3 Air Toxics Results

The Total MICR of all HAPs emitted by Spiritwood Station after applying a 30 out of 70 year occupancy factor, is 1.0E-06, which is within the NDDH *Policy for the Control of Hazardous Air Pollutant Emissions in North Dakota* threshold of 1.0 E-06.

The Hazard Index for Spiritwood Station is 0.622. This value is less than the maximum hazard index of 1.0 for a new source.

The Final MICR and the hazard index are within the respective thresholds for each chemical category; therefore, the proposed Spiritwood Station CHP is in compliance with the NDDH air toxics policy. Emission calculations and the details of the air toxics analysis, including a summary of the ISC-PRIME screen model source files, are provided electronically via the CD accompanying the application.

¹⁶ “Speciation of Arsenic and Selenium in Coal Combustion Products.” P. Shah, V. Strezov and P.F. Nelson, *Energy Fuels*, 2006, ASAP article November 18.

¹⁷ “Proposed Identification of Inorganic Arsenic as a Toxic Air Contaminant.” Staff Report, California Air Resources Board, May 1990.

Figures

Figure 1 Site/Location Map

Figure 2 Facility Location Map

Figure 3 Facility Layout and Stack Locations

Figure 4.1 – 4.4 Process Flow Diagrams

Appendix H
Acid Rain Permit Application

Permit Requirements**STEP 3**
Read the
standard
requirements

- (1) The designated representative of each affected source and each affected unit at the source shall:
 - (i) Submit a complete Acid Rain permit application (including a compliance plan) under 40 CFR part 72 in accordance with the deadlines specified in 40 CFR 72.30; and
 - (ii) Submit in a timely manner any supplemental information that the permitting authority determines is necessary in order to review an Acid Rain permit application and issue or deny an Acid Rain permit;
- (2) The owners and operators of each affected source and each affected unit at the source shall:
 - (i) Operate the unit in compliance with a complete Acid Rain permit application or a superseding Acid Rain permit issued by the permitting authority; and
 - (ii) Have an Acid Rain Permit.

Monitoring Requirements

- (1) The owners and operators and, to the extent applicable, designated representative of each affected source and each affected unit at the source shall comply with the monitoring requirements as provided in 40 CFR part 75.
- (2) The emissions measurements recorded and reported in accordance with 40 CFR part 75 shall be used to determine compliance by the unit with the Acid Rain emissions limitations and emissions reduction requirements for sulfur dioxide and nitrogen oxides under the Acid Rain Program.
- (3) The requirements of 40 CFR part 75 shall not affect the responsibility of the owners and operators to monitor emissions of other pollutants or other emissions characteristics at the unit under other applicable requirements of the Act and other provisions of the operating permit for the source.

Sulfur Dioxide Requirements

- (1) The owners and operators of each source and each affected unit at the source shall:
 - (i) Hold allowances, as of the allowance transfer deadline, in the unit's compliance subaccount (after deductions under 40 CFR 73.34(c)), or in the compliance subaccount of another affected unit at the same source to the extent provided in 40 CFR 73.35(b)(3), not less than the total annual emissions of sulfur dioxide for the previous calendar year from the unit; and
 - (ii) Comply with the applicable Acid Rain emissions limitations for sulfur dioxide.
- (2) Each ton of sulfur dioxide emitted in excess of the Acid Rain emissions limitations for sulfur dioxide shall constitute a separate violation of the Act.
- (3) An affected unit shall be subject to the requirements under paragraph (1) of the sulfur dioxide requirements as follows:
 - (i) Starting January 1, 2000, an affected unit under 40 CFR 72.6(a)(2); or
 - (ii) Starting on the later of January 1, 2000 or the deadline for monitor certification under 40 CFR part 75, an affected unit under 40 CFR 72.6(a)(3).
- (4) Allowances shall be held in, deducted from, or transferred among Allowance Tracking System accounts in accordance with the Acid Rain Program.
- (5) An allowance shall not be deducted in order to comply with the requirements under paragraph (1) of the sulfur dioxide requirements prior to the calendar year for which the allowance was allocated.
- (6) An allowance allocated by the Administrator under the Acid Rain Program is a limited authorization to emit sulfur dioxide in accordance with the Acid Rain Program. No provision of the Acid Rain Program, the Acid Rain permit application, the Acid Rain permit, or an exemption under 40 CFR 72.7 or 72.8 and no provision of law shall be construed to limit the authority of the United States to terminate or limit such authorization.
- (7) An allowance allocated by the Administrator under the Acid Rain Program does not constitute a property right.

**STEP 3,
Cont'd.**

Nitrogen Oxides Requirements The owners and operators of the source and each affected unit at the source shall comply with the applicable Acid Rain emissions limitation for nitrogen oxides.

Excess Emissions Requirements

- (1) The designated representative of an affected unit that has excess emissions in any calendar year shall submit a proposed offset plan, as required under 40 CFR part 77.
- (2) The owners and operators of an affected unit that has excess emissions in any calendar year shall:
 - (i) Pay without demand the penalty required, and pay upon demand the interest on that penalty, as required by 40 CFR part 77; and
 - (ii) Comply with the terms of an approved offset plan, as required by 40 CFR part 77.

Recordkeeping and Reporting Requirements

- (1) Unless otherwise provided, the owners and operators of the source and each affected unit at the source shall keep on site at the source each of the following documents for a period of 5 years from the date the document is created. This period may be extended for cause, at any time prior to the end of 5 years, in writing by the Administrator or permitting authority:
 - (i) The certificate of representation for the designated representative for the source and each affected unit at the source and all documents that demonstrate the truth of the statements in the certificate of representation, in accordance with 40 CFR 72.24; provided that the certificate and documents shall be retained on site at the source beyond such 5-year period until such documents are superseded because of the submission of a new certificate of representation changing the designated representative;
 - (ii) All emissions monitoring information, in accordance with 40 CFR part 75, provided that to the extent that 40 CFR part 75 provides for a 3-year period for recordkeeping, the 3-year period shall apply.
 - (iii) Copies of all reports, compliance certifications, and other submissions and all records made or required under the Acid Rain Program; and,
 - (iv) Copies of all documents used to complete an Acid Rain permit application and any other submission under the Acid Rain Program or to demonstrate compliance with the requirements of the Acid Rain Program.
- (2) The designated representative of an affected source and each affected unit at the source shall submit the reports and compliance certifications required under the Acid Rain Program, including those under 40 CFR part 72 subpart I and 40 CFR part 75.

Liability

- (1) Any person who knowingly violates any requirement or prohibition of the Acid Rain Program, a complete Acid Rain permit application, an Acid Rain permit, or an exemption under 40 CFR 72.7 or 72.8, including any requirement for the payment of any penalty owed to the United States, shall be subject to enforcement pursuant to section 113(c) of the Act.
- (2) Any person who knowingly makes a false, material statement in any record, submission, or report under the Acid Rain Program shall be subject to criminal enforcement pursuant to section 113(c) of the Act and 18 U.S.C. 1001.
- (3) No permit revision shall excuse any violation of the requirements of the Acid Rain Program that occurs prior to the date that the revision takes effect.
- (4) Each affected source and each affected unit shall meet the requirements of the Acid Rain Program.

Step 3,
Cont'd.

Liability, Cont'd.

(5) Any provision of the Acid Rain Program that applies to an affected source (including a provision applicable to the designated representative of an affected source) shall also apply to the owners and operators of such source and of the affected units at the source.

(6) Any provision of the Acid Rain Program that applies to an affected unit (including a provision applicable to the designated representative of an affected unit) shall also apply to the owners and operators of such unit. Except as provided under 40 CFR 72.44 (Phase II repowering extension plans) and 40 CFR 76.11 (NO_x averaging plans), and except with regard to the requirements applicable to units with a common stack under 40 CFR part 75 (including 40 CFR 75.16, 75.17, and 75.18), the owners and operators and the designated representative of one affected unit shall not be liable for any violation by any other affected unit of which they are not owners or operators or the designated representative and that is located at a source of which they are not owners or operators or the designated representative.

(7) Each violation of a provision of 40 CFR parts 72, 73, 74, 75, 76, 77, and 78 by an affected source or affected unit, or by an owner or operator or designated representative of such source or unit, shall be a separate violation of the Act.

Effect on Other Authorities

No provision of the Acid Rain Program, an Acid Rain permit application, an Acid Rain permit, or an exemption under 40 CFR 72.7 or 72.8 shall be construed as:

(1) Except as expressly provided in title IV of the Act, exempting or excluding the owners and operators and, to the extent applicable, the designated representative of an affected source or affected unit from compliance with any other provision of the Act, including the provisions of title I of the Act relating to applicable National Ambient Air Quality Standards or State Implementation Plans;

(2) Limiting the number of allowances a unit can hold; *provided*, that the number of allowances held by the unit shall not affect the source's obligation to comply with any other provisions of the Act;

(3) Requiring a change of any kind in any State law regulating electric utility rates and charges, affecting any State law regarding such State regulation, or limiting such State regulation, including any prudence review requirements under such State law;

(4) Modifying the Federal Power Act or affecting the authority of the Federal Energy Regulatory Commission under the Federal Power Act; or,


(5) Interfering with or impairing any program for competitive bidding for power supply in a State in which such program is established.

Certification

STEP 4

Read the
certification
statement,
sign, and
date

I am authorized to make this submission on behalf of the owners and operators of the affected source or affected units for which the submission is made. I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment.

Name: Richard R. Lancaster	
Signature 	Date 05/04/07