
*Pioneer Generation Station
Phase II Project*

Simple Cycle Gas Turbine Units 2 and 3

*Application to the North Dakota Public Service Commission for a Waiver of
Procedures, and Consolidated Certificate of Site Compatibility*

Williams County, North Dakota

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1 Introduction

Basin Electric Power Cooperative (Basin Electric) is a regional wholesale electric and transmission cooperative owned and controlled by its member cooperatives. Basin Electric includes 134 rural electric systems operated by member cooperatives and is one of the largest electric generation and transmission cooperatives in the U.S. Basin Electric serves approximately 2.8 million customers in 540,000 square miles covering portions of nine states: Colorado, Iowa, Minnesota, Montana, Nebraska, New Mexico, North Dakota, South Dakota, and Wyoming.

Basin Electric submits this Application for Waiver of Procedures, and a Certificate of Site Compatibility for the Pioneer Generation Station Phase II Project (PGS Phase II) to the North Dakota Public Service Commission (ND PSC). The Pioneer Generation Station Phase II Project includes the addition of two simple cycle natural gas-fired combustion turbines (CT) to the Pioneer Generation Station Unit 1 (PGS Phase I), which is currently under construction.

PGS Phase I is a single LM 6000 PC SPRINT simple-cycle combustion turbine with a nominal output rating of 45 MW with a clutch attached to isolate the combustion turbine from the generator set. With the clutch engaged the generator acts similar to a synchronous condenser thus providing much needed voltage support to the local transmission system during times that generation is not required. Construction on the PGS Phase I began on June 4, 2012. PGS's electrical interconnection with the transmission grid is thru a short (less than ½ mile) 115-kV line to Mountrail-Williams Electric Cooperative's (MWEC) Stateline I Substation (Figure 1). Chapter 49-22 of the Energy Conversion Siting Act requires project proponents to obtain a permit if the generation size exceeds 50 MW. Furthermore the Act requires siting of transmission lines in excess of 115-kV. Basin Electric was not required to submit a permit application for PGS Phase 1 from the ND PSC because the project fell below the permitting thresholds. PGS Phase II includes developing PGS Units 2 and 3. PGS Phase II will be General Electric (GE) aero derivative LM6000 PC SPRINT models identical to PGS Unit 1; however the two additional units will not incorporate a clutch. The combined output for PGS Units 2 and 3 is 90 MW (nominal). With the addition of Units 2 and 3 the total generation capacity of PGS Phase I and PGS Phase II (PGS) will be 135 MW (nominal).

Basin Electric received a conditional use permit from Williams County to change the zoning from agricultural to industrial use on a 120 acre parcel located in Section 20, T155N, R103W, Williams County, North Dakota (ND). The anticipated commercial operation date for PGS Phase I is April 2013. The PGS Phase I plant site area is approximately 7 acres. (Figure1).

Basin Electric has provided the information required by the North Dakota Energy Conversion and Transmission Facility Siting Act in this application. Basin Electric has considered exclusion areas, avoidance areas, the selection criteria, and the policy criteria in the design of the PGS. In addition, sufficient generation design and technical information has been provided for a thorough evaluation of the reasonableness of the site studied. Basin Electric's policy is to locate and design the proposed Project by minimizing environmental impacts and utilizing an existing generation station site.

Section 1.5 and Table 1.5-1 outline the information required to fulfill the requirements for a Certificate of Site Compatibility from the PSC using the PSC Guidelines. These tables also identify where these requirements are addressed in this document.

1.1 Provisions Requested to be Waived and Minimal Adverse Effect

By motion on August 1, 2012, the PSC shortened the one-year waiting period between filing the letter of intent and a siting application to 30 days. By this Application, Basin Electric requests that the PSC, pursuant to NDCC Section 49-22-07.2, waive the following requirements:

1. Mylar maps and stereo-pair aerial photographs as set forth in the PSC's Application Guidelines for a Corridor Certificate and a Route Permit. Geographic Information System (GIS) developed maps are provided in the Application.

The PSC's Application Guidelines for Waiver of Procedures and Time Schedules require a facility description, need for, cost of, and justification for the request for waiver, together with evidence that the project will produce minimal adverse effects. As demonstrated in the Application, and as summarized below, Basin Electric's Waiver Request and the issuance of a Certificate of Site Compatibility is justified, as the proposed facility is of such design, location, and purpose that it will produce minimal adverse effects.

1.2 Description of Project

1.2.1 Type, Size and Design

PGS Units 2 and 3 will be LM6000 – PC SPRINT turbines, each having an output rating of a nominal 45 MW and an approximate heat rate of 9,600 Btu/Kw Hr HHV. These units utilize water injection along with a Selective Catalytic Reduction (SCR) system to achieve a high level of NO_x Control. The units also incorporate COR to minimize CO emissions. Following the SCR, the unit's flue gas will be released to the atmosphere through individual 80 foot tall stacks. Natural gas is supplied to PGS by WBI Energy Transmission, Inc.'s 1800 foot long, 8 inch diameter pipeline that originates from ONEOK's Stateline I Gas Processing Plant gas interconnection to Northern Border Pipeline.

The electrical interconnection for the PGS is a ½ mile, 115-kV transmission line to MWEC's Stateline I Substation, which is located adjacent to ONEOK's Stateline I Gas Processing Plant. The Stateline I Gas Processing Plant is adjacent to PGS but separated by Williams County Road 5 (151st Avenue NW) (Figure 1).

Water requirements range from 25 gpm/unit in the winter to 50 gpm/unit in the summer when in operation. Potable water will be supplied to the plant site from the local rural water distribution system and placed into the existing 120,000 gallon service tank. The potable water is further treated thru the utilization of a portable demineralization trailer and transferred into the 220,000 gallons demineralization water storage tank. When required the demineralization trailer is regenerated offsite. Any excess process water will be evaporated on-site or if required, hauled off site to a licensed waste facility.

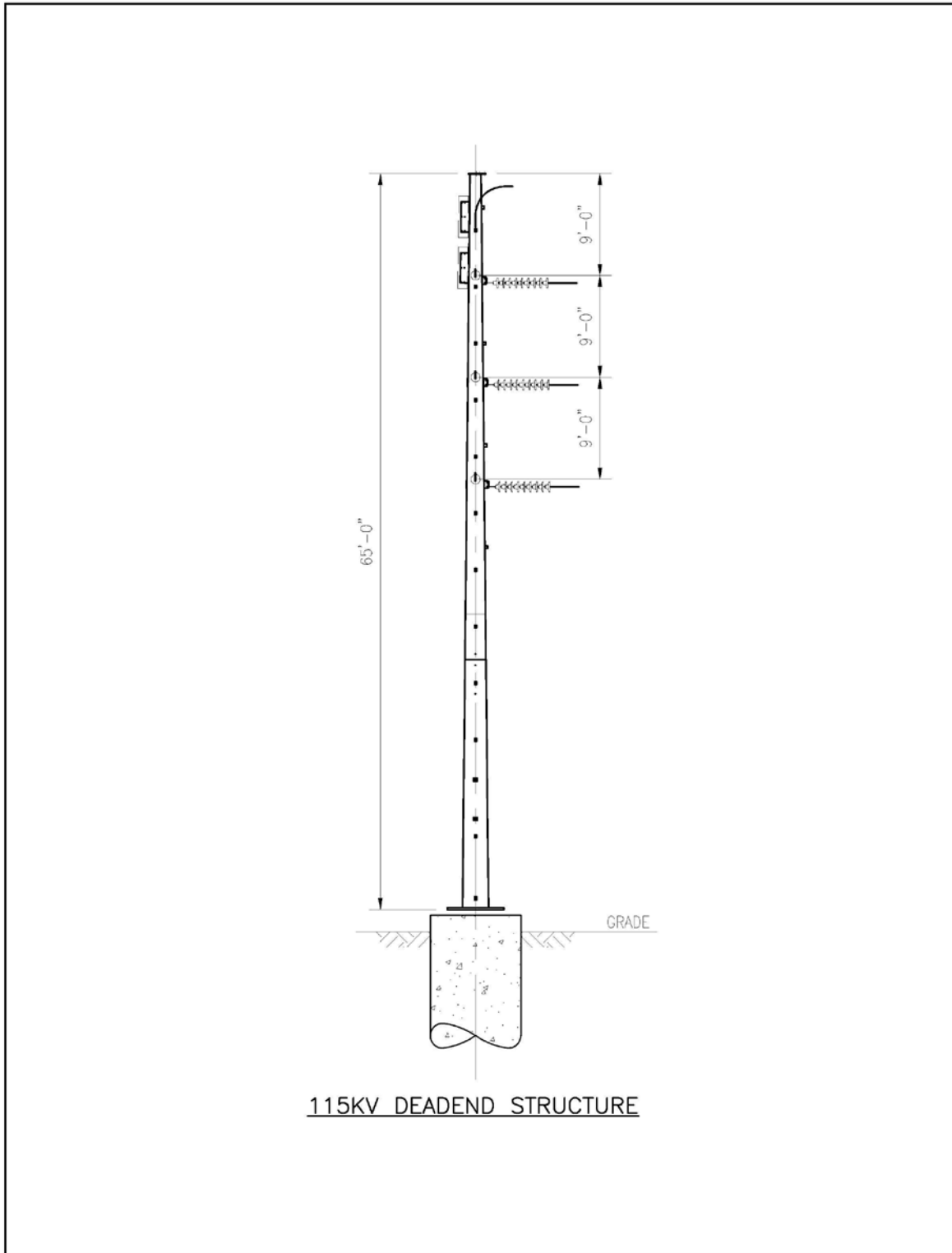
The PGS Phase II construction activity will occur within the approximately 7 acre fenced area of PGS Phase I. PGS was designed as a zero discharge facility by assuring that all storm water runoff of the facility is routed to the storm water run-off pond. The storm water run-off pond design is to hold run-off from a 25 year, 24-hr rainfall event.

The PGS facility includes an operator/maintenance building. This building includes the water treatment area for the demineralization trailers, service and demineralization water forwarding pumps, and instrument air compressors. Also included in this building is a maintenance/warehouse area and an operation control area. This facility was designed to be operated locally at the site or operated remotely from either Basin Electric's Culbertson Station located near Culbertson, Montana or Headquarters located in Bismarck, ND.

All waste generated from construction of the project will be collected and placed in acceptable waste containers, to be hauled off-site and properly disposed by a licensed contractor.

Two transmission 115-kV single pole galvanized steel structures (Exhibit 1.2-1) will be required to deliver the power generated from PGS Phase II to the Stateline I Substation by extending the 115-kV system 650 feet to interconnect to PGS Phase I (Figure 2).

Exhibit 1.2-1. Single Pole Galvanized Steel Structures.



1.2.2 Product

Energy will be generated and distributed to the electrical grid system serving the rapidly increasing electrical load requirements in northwestern North Dakota. The PGS will improve the reliability of service into the area.

1.2.3 Location

The proposed site is located approximately 15 miles northwest of Williston, North Dakota in T155N, R103W, Section 20, Williams County, North Dakota.

1.2.4 Geographical Service Area

The general area to be served by the energy conversion facility is Basin Electric's Service territory, specifically the area in northwestern North Dakota.

1.3 Project Schedule

The anticipated schedule for the project is below:

- Obtain Site Compatibility permit by May 1, 2013
- Start construction on July 2013
- Complete construction March 1, 2014
- Testing operations June 30, 2014
- Commence commercial operation July 2014

Note: Should all approvals be received the schedule will be accelerated accordingly.

1.3.1 Future Plans

The PGS is capable of supporting additional generation from the electrical, water and fuel supply perspective. The PGS fenced area would need to be expanded to support additional generation. At the time of this application, Basin Electric does not have plans to increase the generation at PGS beyond the Project.

1.4 Need for Facility

Basin Electric has identified the need for additional electric generation in northwestern North Dakota as a result of increased demand and to meet reliability and system stability requirements for the region.

1.4.1 Load Forecast Process

Basin Electric's primary mission is to provide electrical power to its member-owners. In order to accomplish this objective, the cooperatives must understand how the consumers are presently using their electricity and must forecast the consumers' future electrical requirements. The projection of future requirements serves as one of the main planning tools in determining the cooperative's future operating strategy. Adequate resources and transmission facilities must be maintained and, where necessary, developed to deliver the required power to the members.

Two major studies are jointly prepared by the members and Basin Electric to address where the members are presently using their power (end use survey) and how much they will require in the future (load forecast). These studies are prepared in accordance with the RUS general guidelines. Both the end use survey and the load forecast represent a joint effort by the distribution cooperatives, the G&T cooperatives, and Basin Electric. In order to assure all segments of the cooperative's structure are involved, a Load Forecast Technical Committee was established. This committee consists of representatives from the three tier cooperative structure.

This load forecast was prepared in accordance with the Rural Utilities Service (RUS) general guidelines and the procedures specified in the 2012 Update of the 2011 Load Forecast Work Plan submitted to and approved by RUS.

The load forecast process represents a joint effort by the distribution cooperatives, the G&T's, and Basin Electric. In order to assure all segments of the cooperative structure were involved in the load forecast process, a Load Forecast Technical Committee was established consisting of representatives from the distribution cooperatives, the G&T's, and Basin Electric.

The Load Forecast Technical Committee approved the timetable and procedures used in preparing the 2012 Update. RUS attendance and participation at the committee meeting provided a forum for the cooperatives and RUS to exchange ideas and discuss problems.

The individual member's load forecast analyzed the cooperative's service area for historical and projected developments that have and will influence future load growth

This committee establishes the project timetable and develops the general procedures used in the two projects. RUS attendance and participation at the committee meetings provides a forum for the cooperatives and RUS to exchange ideas and improve the process. RUS requires the submittal of a board approved load forecast work plan. Section VII is the 2012 Update of the 2011 Load Forecast Work Plan as approved by the Basin Electric Board of Directors and by RUS.

End use surveys and load forecasts are prepared for all Basin Electric members, except Tri-State, which conducts their own studies. The other participating members represent cooperatives located in North Dakota, South Dakota, Minnesota, Montana, Iowa and Wyoming. Individual studies are prepared for each of the participating distribution cooperatives. The distribution cooperative studies are combined to obtain G&T studies and the G&T studies are combined to obtain a Basin Electric report.

The purpose of the load forecast is to provide the distribution cooperatives, the G&T's, and Basin Electric with a forecast of their power supply obligations to their consumer-owners. The load forecast, which is prepared on a distribution cooperative basis, is conducted in accordance with RUS criteria. The criteria defines a load forecast as a thorough study of a cooperative's electric loads and the factors that affect those loads in order to determine as accurately and as practical the cooperative's future requirements for energy and capacity.

The 2012 Update is a weather normalized forecast. As a result, temperature extremes and extended periods of hot, cold, wet, and/or dry weather conditions can cause deviations from weather normalized demand and energy forecasts. Basin Electric has done analysis suggesting these weather deviations could amount to a 10 percent deviation in the demand forecasts and potentially lower variations in energy forecasts. Prudent planning for extreme weather events should be considered when using this forecast.

Econometric Models. The basis for econometric modeling is to identify factors in the economy that have historically affected electrical consumption. This is accomplished by using regression analysis software that establishes a mathematical relationship between the economic factors and power usage. The mathematical relationship, which is in the form of algebraic equations, represents the econometric model.

Econometric models are used for the majority of the member systems to forecast residential sales. In most instances, two econometric models are developed for each cooperative. The first model relates the number of historical residential consumers to factors that have been shown to influence their numbers in the past. The second model is developed for the average annual usage per residential consumer. Multiplying the forecasts of these two models developed the total residential energy forecast.

The small commercial modeling and other smaller consumer sectors are developed using econometric or trending models. In some cases they may also be judgmental forecasts or a combination of the three.

The distribution member forecasts are forecasts of annual energy requirements by category. To translate the annual energy requirements into monthly energy and demand needs, two econometric models were developed to distribute this correctly. The first model uses historical monthly energy purchases along with actual weather patterns to determine the monthly per unit purchase pattern. This purchase pattern is applied to the annual energy forecast to develop a monthly energy forecast. The second model was used to develop a monthly demand forecast where an econometric model is fitted through the historical load factors. The resultant load factor pattern is applied to the monthly energy forecast to determine the monthly demand forecast.

The econometric models are based on regression analysis. Regression analysis is a statistical technique used to identify a relationship between an observed event and other measured events that can be shown to be related. These are known as the dependent and the independent variables, respectively.

Independent variables must be applicable to the members' service territory and be of importance to the local economy. This is the first step to ensure the model will accurately explain the historical trends. This gives the confidence that the same factors that have influenced previous trends will accurately reflect future expectations.

The next step to determine if the model is acceptable is the combination of the statistical results of the model. The model statistics include the R-squared, adjusted R-squared, and basic statistical information. The R-squared indicates the amount of variation of the dependent variable explained by the independent variables. To show the impact of changes in the number of independent variables used in a model, an adjusted R-squared is used; therefore, the explained variation can be compared with the same dependent variable and different numbers of independent variables.

The statistical significance of the explanatory variables used in the model is measured by a t-statistic. A t-statistic (ignoring negative signs) of at least 2.0 would be required for a 95 percent level of confidence and 1.5 for a 90 percent level of confidence, depending upon the number of observations and variables used in the model.

The Durbin-Watson test examines the equation residuals that are the differences between the fitted and the actual historical values. In a good model the residuals are randomly distributed and are of approximately constant magnitude. This indicates the model has explained all of the patterns in the data. In general, a Durbin-Watson near 2.00 indicates the absence of autocorrelation.

When residuals are not randomly distributed, a Cochrane-Orcutt transformation (AR term) can be computed to develop an equation that does have randomly distributed residuals. After the variables are transformed by adjusting the equation according to the value of the AR term, a new equation is developed.

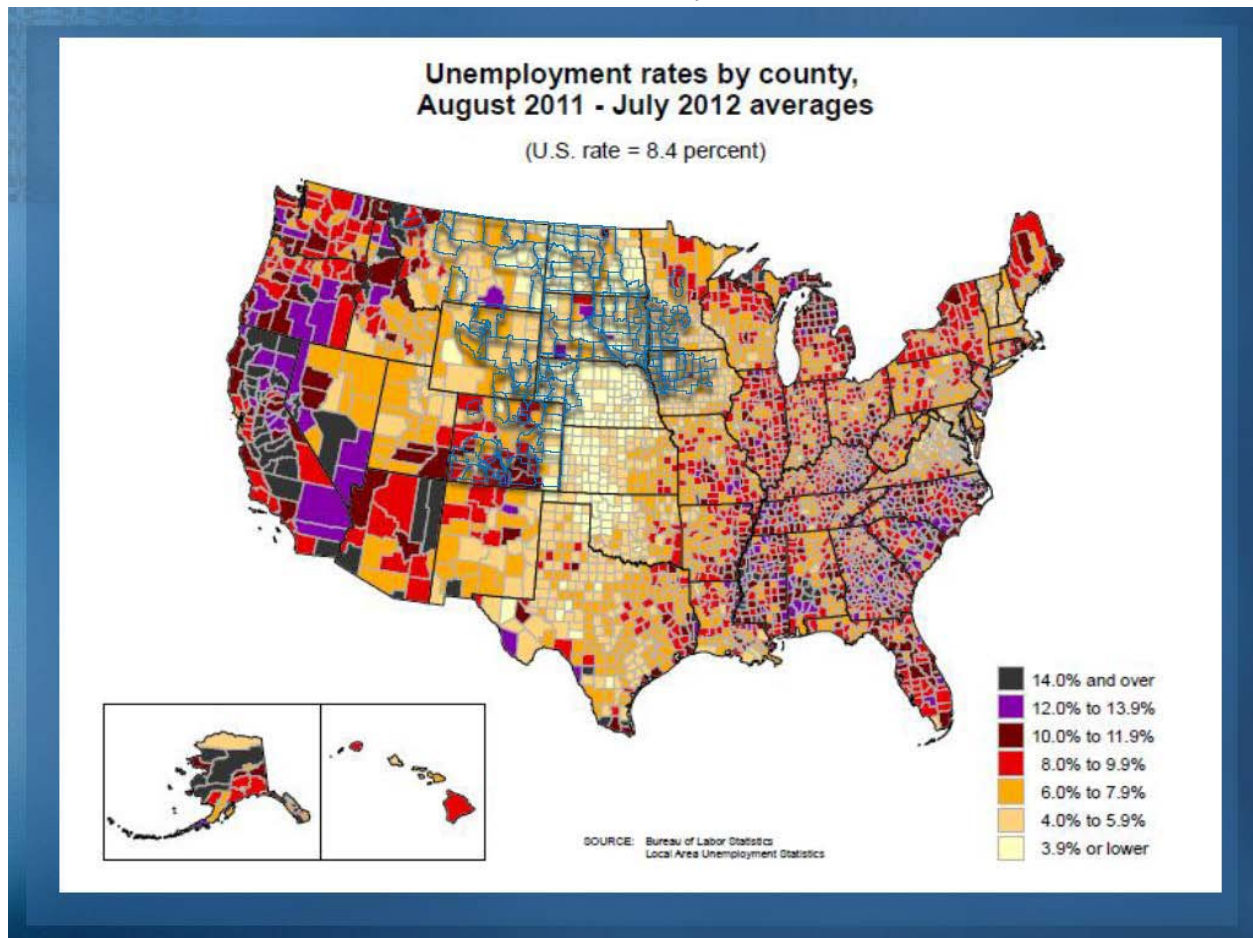
The combination of the variables selected, model statistics, and the forecasted results all are considered together to determine the validity of the forecast.

To develop the 2012 Update, as well as the 2011 Load Forecast, a more efficient and powerful econometric software package was used. It is called MetrixND. Itron has developed, tested, and refined MetrixND for more than 10 years, providing a proven track record in the real world of energy forecasting.

MetrixND allows rapid development of accurate forecasts, releasing valuable time for making decisions and communicating results. Designed to take advantage of advanced Microsoft Windows capabilities, the intuitive user interface and drag-and-drop architecture streamline the development of forecasting variables and models. Powerful forecasting techniques, such as neural networks, multivariate regression, ARIMA and exponential smoothing make MetrixND the only tool needed to forecast annual and monthly sales and long-term demand patterns. It also allows rapid computations of G&T totals and power supply shares after the total forecast loads have been developed for the Class C cooperative membership. The implementation of the MetrixND product allows the forecasts to be updated quickly with the most up-to-date information possible. This rapid forecast development tool allows Basin Electric and its members too quickly and accurately model changes in macroeconomic and microeconomic conditions to be reflected in the final results.

Explanatory Variables. The economy of the upper Midwest has fared the recent nationwide economic downturn quite well, due to the relative strength of the agricultural economy and energy exploration. Unemployment in the Basin Electric territory, for the most part, has not seen the major swings that other areas of the country have. Due to a diverse economy that is not centered in a singular industry these strong historical employment trends are expected to continue into the future. The following graph (Exhibit 1.4-1) indicates the average unemployment rates for the last 12 months with the Basin Electric cooperative service territory overlaid, and shows the relative strength of the economy in the upper Midwest.

Exhibit 1.4-1. Unemployment Rates



The major sources of the explanatory variables are as follows:

Historical data for county and metropolitan statistical area (MSA) level employment, population, earnings and income is provided by the U.S. Department of Commerce Bureau of Economic Analysis (BEA) and the Census Bureau. The state and federal governments monitor the data closely as it serves as a measure of the state of the local economies.

Since the BEA implemented the North American Industrial Classification System (NAICS) to replace its previous Standard Industrial Classification System (SICS), and have only 2001-2008 data available on the new

database, the entire set of historical and forecast employment data was used from Woods & Poole Economics, Inc. (W&P). W&P is an econometric forecasting firm that provides projections for employment, earnings, income, and population on a county and MSA basis. W&P used BEA data through year 2008. The exception to this is the population data, where W&P data was updated to include the 2009 data available from the US Census Bureau.

Historical agricultural production and price data was obtained from the United States Department of Agriculture (USDA) and forecasted data was obtained from the Food and Agricultural Policy Research Institute (FAPRI) 2010 U.S. Baseline, as well as the USDA baseline agricultural projections. FAPRI specializes in agricultural research and forecasting.

FAPRI's primary responsibility is to analyze for Congress the effects of proposed agricultural legislation. In addition to that primary responsibility, it provides forecasts to many other external organizations which are heavily influenced by agricultural activities. FAPRI is recognized for its expertise in agriculture analysis and forecasting.

The FAPRI baseline projection used is a result of a three-step process. It begins with macroeconomic assumptions for the U.S. developed by Global Insight (formally DRI-WEFA). The assumptions are used to develop a FAPRI preliminary baseline, which is then distributed to a group of reviewers. The reviewers critique and comment on the validity of the assumptions and the baseline projection. After receiving comments, the baseline projection is revised and finalized.

The FAPRI baseline developed includes the assumptions that government laws or policies remain unchanged, that normal weather occurs, and that random events such as droughts, diseases, and floods do not occur.

The FAPRI and the USDA historical and projected data are used for forecasting some of the residential service areas where farming and ranching have a big influence.

The majority of the members' consumers are engaged in farming/ranching and agriculture. In most of the states the members serve, farming/ranching and agriculture is first in new wealth creation.

Since agriculture is the dominant industry in most of the areas our members serve, agricultural explanatory variables have been heavily incorporated into the econometric models. In the 2012 Update, agricultural explanatory variables included: national beef production and average prices, national corn production and average prices, national wheat production and average prices, national hog production and average prices, along with county level production of selected agricultural variables.

Other demographic and economic variables used in the 2012 Update included:

- Population
- Households
- Total Employment
- Farm Earnings
- Transfer Payments
- Total Personal Income
- Farm Employment

The forecasts for these variables, which are available on a county basis, were obtained from W&P.

Another major consideration in the load forecast econometric modeling is the competition between electricity and alternate fuels. This competition occurs in space heating, water heating, cooking, clothes drying, and grain drying. The future price of alternate fuels and how they compare with the distribution cooperative's electricity prices affects electric consumption.

Historical alternative fuel prices are obtained on a state level from the DOE's, State Energy Data 2009 Price, Consumption and Expenditures Data (SEDS). Basin Electric uses DOE projections of regional price forecasts to develop projections of alternative fuel prices. A further explanation can be found in the ratio variable narrative in the residential energy use per consumer section.

W&P is used as sources for the economic and demographic historical and forecasted county data. IHS Global is used for county, metro, state and national economic data.

IHS CERA is used for natural gas and oil prices for the energy related loads. Wood Mackenzie, IHS, and DOE data are also used in the energy related sectors.

Projected electricity prices were obtained from the distribution cooperative's financial forecast. The econometric models address the competition between electricity and alternate fuels by including a ratio computed by dividing electricity costs by the predominant alternate fuel cost in each member's service territory. The ratio is a weighted average of alternate fuels used by the residential consumers for their primary heating system, as indicated by the cooperative's end use survey. In order to compare the energy alternatives on a uniform basis, the alternate fuel and electricity prices are converted to real dollars on a per million British thermal unit (Btu) basis.

Weather has a significant effect on the cooperative's energy requirements due to energy uses such as heating, grain drying, and air conditioning. In order to address these effects, the econometric models normally include either heating degree days, cooling degree days, or a combination of both.

Historical heating and cooling degree day's weather data was obtained from the National Oceanic and Atmospheric Administration (NOAA). This information is received for first-order stations, as well as all cooperative stations within the geographic region. Forecasts for weather data are assumed to be the simple average of 1996-2010 values.

In addition to the previously mentioned forecast variables, there is a tremendous amount of commercial projects being monitored for their impacts on Basin Electric's wholesale energy sales. These industries are oil, coal, coal bed methane (CBM), ethanol, and bio-diesel related. Each of these categories is discussed in detail below.

Inflation Indexes. For the 2012 Update there are three inflation indexes used to deflate historical data and the same to project future inflation. These indexes or deflators use the base 2010 equals 100. Those three indexes include:

Producer Price Index (PPI) (all commodities): This index is used to deflate crude oil prices. Real 2010 dollar crude oil prices are used as a variable in the oil related models and forecasts and also in residential models in oil producing areas. The forecast for the PPI is obtained from the Energy Information Administration's 2011 Annual Energy Outlook (AEO).

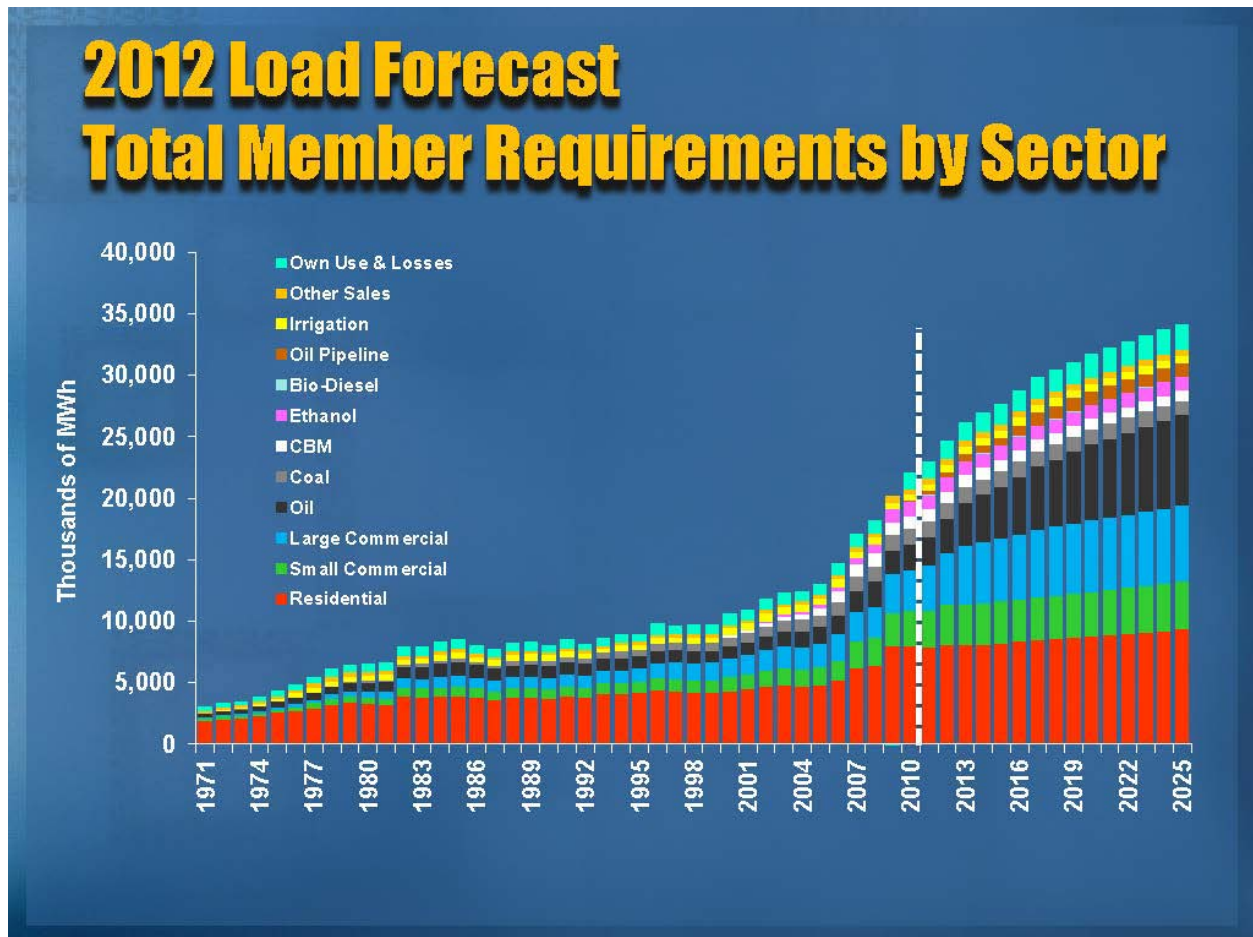
Gross Domestic Product - Implicit Price Deflator (GDP-IPD): This index is used to deflate all agricultural monetary data from FAPRI to real 2010 dollars. The forecast is obtained from the Congressional Budget Office.

Personal Consumptions Expenditures - Implicit Price Deflator (PCE-IPD): This index is also obtained from the Congressional Budget Office. This implicit price deflator is used to deflate all non-FAPRI monetary data other than that covered by GDP-IPD and PPI to real 2010 dollars. This index is used to deflate such data as electricity prices, alternative fuels, personal income and earnings. Also, it is used to convert current prime interest rates to real prime interest rates.

1.4.2 Basin Electric: Load Forecast Results

Member Forecast. The sector results for the 2012 Load Forecast is outlined below. Strong growth in the Williston Basin Oil sector is underpinned by historically strong residential and non-energy related commercial sectors. A discussion of each sectors growth is below (Exhibit 1.4-2).

Exhibit 1.4-2. 2012 Load Forecasts



Residential Forecasts. The load forecast continues to concentrate on the residential classification since it represents a large portion of the energy sales for Basin Electric. The residential energy forecasts are prepared by (i) forecasting the number of residential consumers; (ii) forecasting the average annual energy consumption per residential consumer; and (iii) multiplying the two forecasts together to obtain a total residential sector energy forecast. All load forecasts are net of demand side management.

The starting point in the forecasting process is to develop historical databases for each distribution cooperative. These databases contain information on the member's monthly energy sales by consumer classification. They also provide data on the cooperative's own use and losses, and data on their monthly demand and energy wholesale power purchases. The databases are developed annually from the information the members report to RUS on Form 7 or its equivalent. The data is updated and modified to reflect reclassifications that occasionally occur between consumer categories at the distribution cooperative. These reclassifications may result from changes in the cooperative's rate structure or the size criteria of different rate categories.

Subsequent to the completion of the historical database development, regression analysis software is used to identify economic, demographic, and meteorological factors that have affected the member's power requirements. These factors are called explanatory variables as they explain why the electric requirements change. While the explanatory variables are first used to develop the econometric models based on historic relationships, the variables are also used to develop the forecasts that require historical and forecasted values.

Small Commercial. The Small commercial classification consists of commercial accounts that are generally 1,000 kVA or less. This section addresses the econometric models that forecast the small commercial consumers and energy use. The models developed took into consideration the historical factors that statistically, demographically, and economically influenced each members number of small commercial consumers and small commercial energy use.

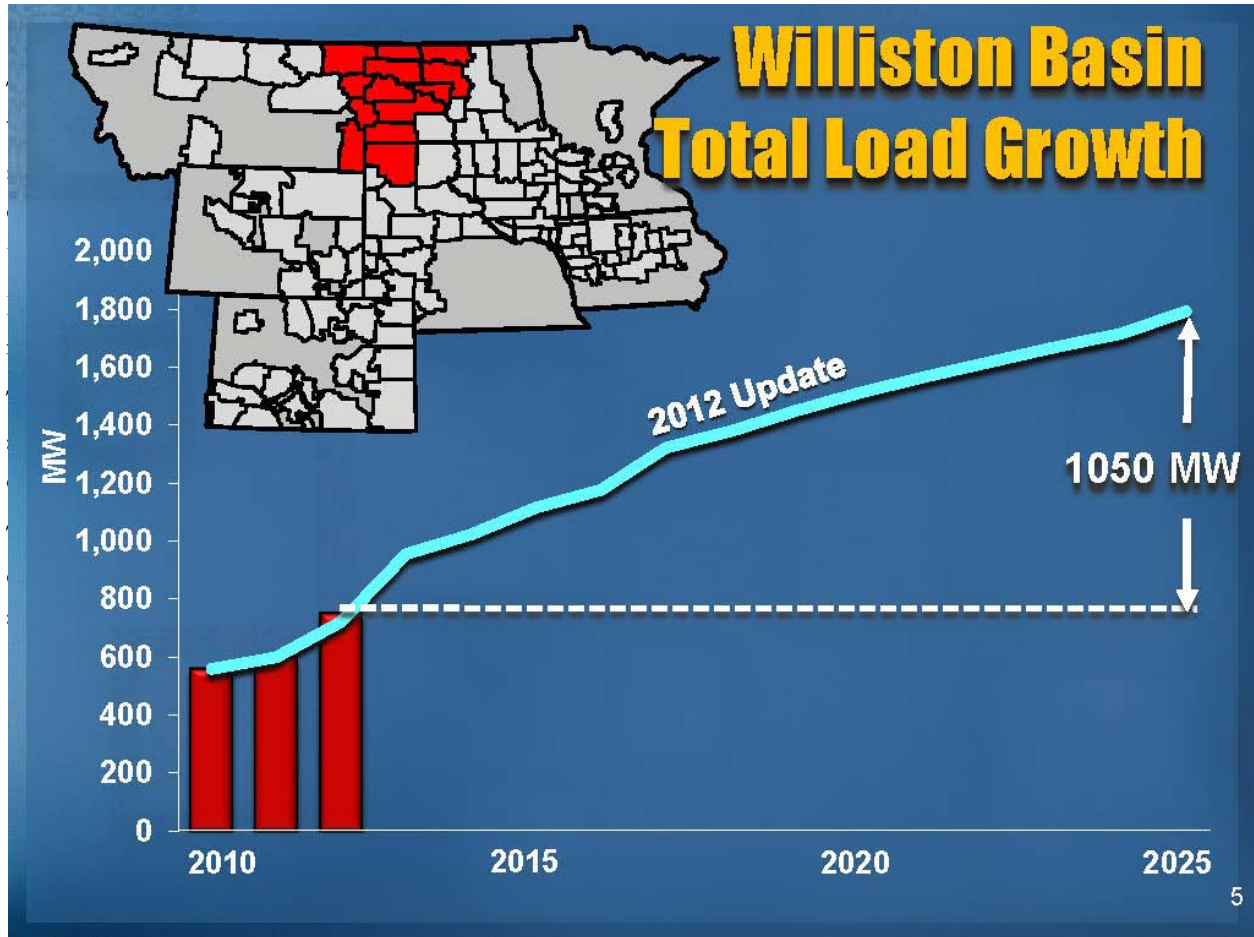
It has been observed that there is a strong positive relationship between the small commercial consumers and total energy to a national variable, real domestic gross product.

Large Commercial. The large commercial classification consists of commercial accounts that are generally 1,000 kVA or larger. The large commercial classification was modeled using a national economic variable. Real gross domestic product was used for the large commercial consumer model and real consumer spending nondurables was used to model large commercial energy.

Oil Related Commercial Forecast. The service territory of Basin Electric's members in Western North Dakota, Eastern Montana, and Northwest South Dakota lies within a geological formation known as the Williston Basin. In addition to the Williston Basin, Basin Electric also provides wholesale electricity to the Powder River Basin (PRB) in Northeastern Wyoming, which also produces a considerable amount of oil.

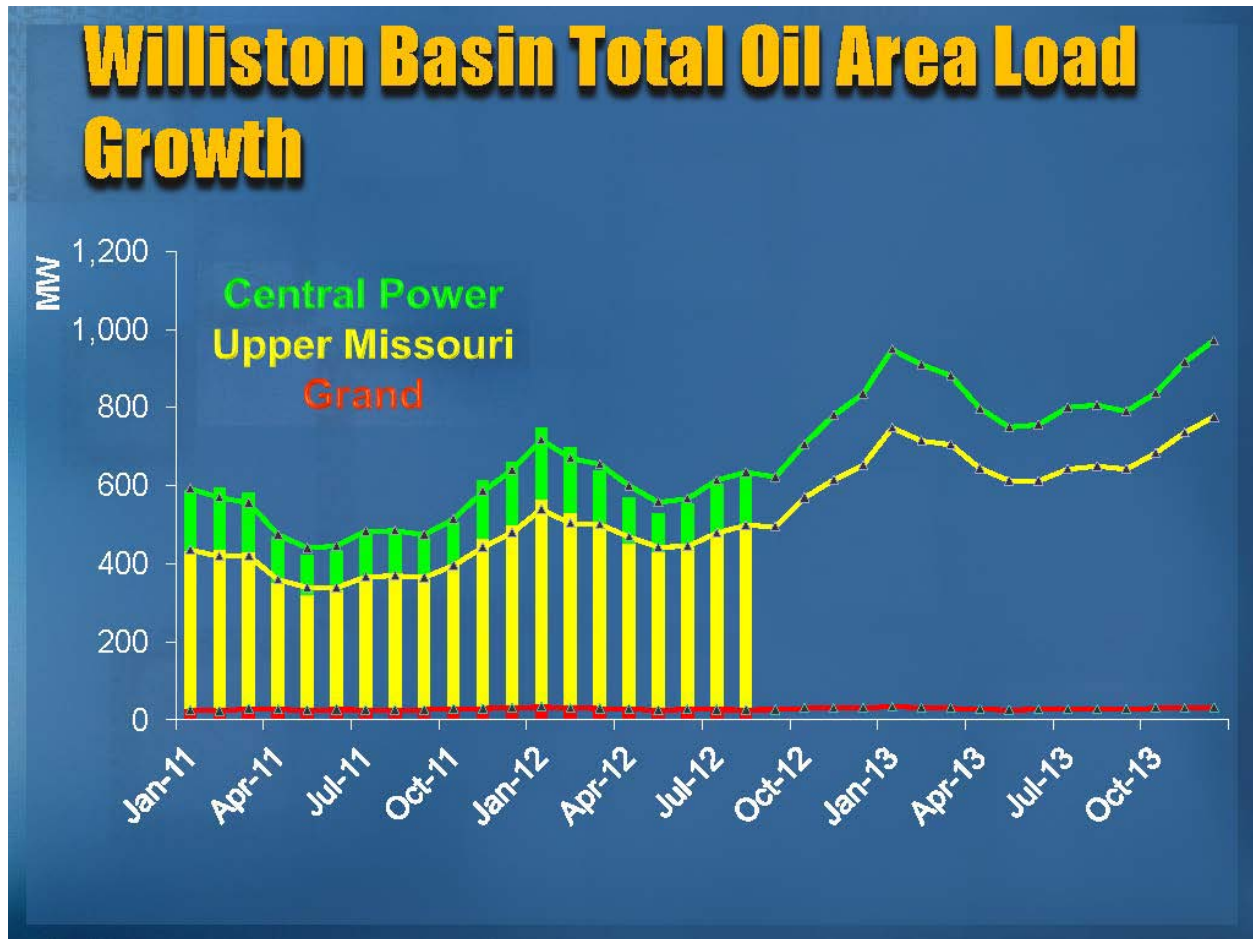
The following graph (Exhibit 1.4-3) depicts the growth of the oil related load. A tremendous amount of growth is expected in the next 15 years.

Exhibit 1.4-3. Growth of oil related load



The following graph (Exhibit 1.4-4) depicts the monthly performance of the 2012 Load Forecast for the members located within the Williston Basin. Winter 2011-2012 load levels are expected to be seen again by October of 2012.

Exhibit 1.4-4. Monthly Performance



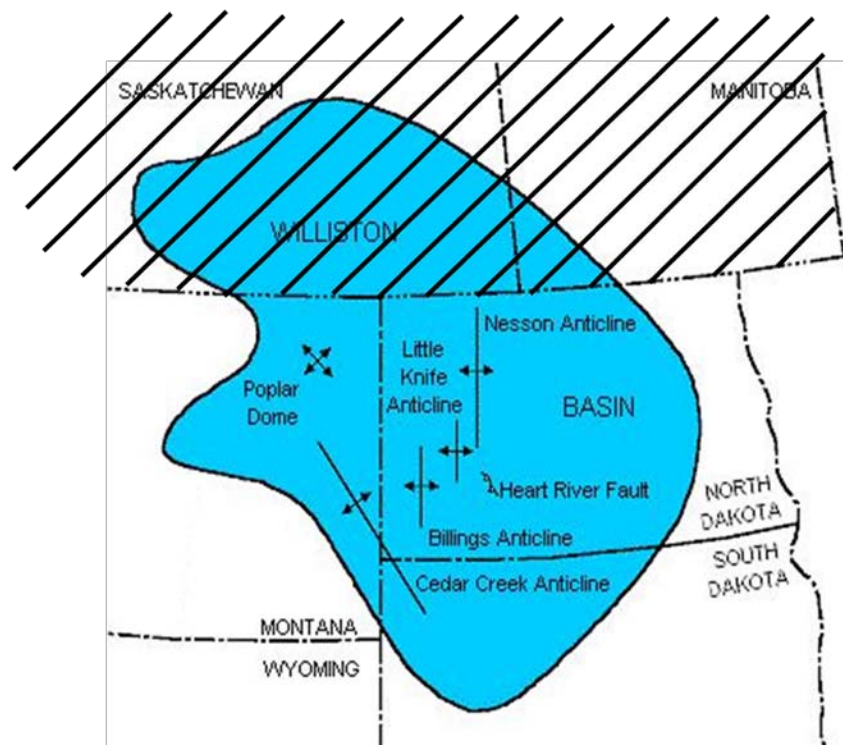
Oil loads have been somewhat cyclical in the past. This was mainly due to oil price volatility. Domestic oil prices are largely influenced by international oil markets, which are influenced by sometimes radical conditions and unstable situations. Oil prices are also significantly influenced by radical weather conditions such as the hurricanes occurring in the Gulf of Mexico. Oil prices are also influenced by national and international demand, the value of natural gas, and the value of the U.S. dollar. In recent years, developing India and China economies have been identified as very significant users of oil and hence putting upward pressure on oil prices.

Due to the magnitude of the forecasted oil loads, a decision was made to get an independent forecast of the regional loads for the Williston Basin.

1.4.2.1 Williston Basin Oil and Gas Related Independent Load Forecast

Electric utilities serving within the Williston Basin have experienced tremendous load growth in recent years. In order to prepare to meet this electric demand, it is important to forecast how much new electrical load is expected from the oil and gas activity along with the ancillary services that go along with this type of economic activity such as housing, consumer service businesses, retail, oil and gas service companies, etc. Growth in Williston Basin communities is impacting Montana Dakota Utilities Co. (MDU) and the electric cooperatives in North Dakota, Montana, and South Dakota. The scope of this study (Exhibit 1.4-5) will focus on the electric utilities' service areas, encompassing all of the Williston Basin within the United States.

Exhibit 1.4-5. Scope of the Study



There will be a minimum of three parties involved in this contract, the North Dakota Transmission Authority, Basin Electric Power Cooperative, and MDU, referred to collectively as the study “Owners”. The information sought by each Owner differs. Basin Electric Power Cooperative and MDU desire to have information on a county level basis.

Load Forecast Model and Inputs. The consultant shall perform an assessment of Williston Basin oil and gas activity and develop an econometric model for the development of the oil plays within the service area. The independent input assumptions to this model shall include, but not be limited to, the following:

Required Infrastructure. The consultant shall evaluate the demand and energy needs of current and expected temporary and permanent housing, small industrial and commercial businesses required to

service the oil and gas activity, and retail and lodging impacts. Consultant shall develop a correlation between well count and required infrastructure.

Drilling Activity. The consultant shall evaluate, assess and forecast the number of new oil wells to be drilled and completed in all of the formations in the Williston Basin for the twenty year period. The consultant shall determine the completion date and energy requirements of new wells in the Bakken/Three Forks, Tyler, and Spearfish formations. The consultant shall also determine well spacing and energy requirements per drill site to fully develop the oil play.

Power Requirements. The consultant shall develop qualitative oil and gas production curves and identify the pumping loads for a generic well in each of the identified formations. In addition, they will determine the total oil and gas production for the entire service area, including the number of salt water disposal injection wells needed to fully develop the oil and gas play and the associated power needs over the lifecycle.

Well Life-Cycle. The consultant shall identify the characteristic life-cycle operating well profile for each formation and recovery technique (primary, secondary, tertiary), as well as the amount of energy and demand required for each stage of the life-cycle, the number of wells (as a percentage) that are currently using secondary and tertiary recovery methods, and the length of time such methods can be used.

Oil Price Forecasts. The consultant shall provide an independent high, medium and low regional oil price forecast for the 20-year forecast period, along with a break even oil price range by formation for continued development.

Pipeline and Refinery Capacity. The consultant shall determine the ability for the existing infrastructure to adequately move oil and gas to regional refineries and processing centers and other export market hubs, including obtaining information on new projects and identifying their potential power load requirements.

Environmental. The consultant shall identify major environmental concerns or threats to the future of oil and gas development in the Williston Basin.

Miscellaneous. The consultant shall identify other potential oil development issues that could affect future power load.

Opinions. The consultant shall include opinions regarding: The future of hydraulic fracturing, water availability, air quality impacts, flaring restrictions, and salt water disposal well needs as it could impact oil development; and limiting factors, including availability of drilling rigs, equipment, materials, labor, housing and service companies.

The results from the third party forecast are expected to be released later this fall.

Coal Related Commercial Forecast. The service territory for the coal production of Basin Electric members is located in Wyoming, Montana, and Western North Dakota. Generally, this region is considered by the Energy Information Administration as Western coal production in the United States, which has grown steadily since 1970 and continues to increase. Most of the increase in output originates from mines located in Wyoming, Montana, and North Dakota. The majority of this Western coal production occurs in Wyoming

and Montana in the coal fields referred to as the Powder River Basin (PRB), which includes the Northern PRB (in Montana) and the Southern PRB (in Wyoming).

According to the Energy Information Agency (EIA), Wyoming has been the largest coal producing state for many years. In 2010, Wyoming produced 442 million short tons of coal.

Econometric forecasts are developed for the coal related portion of the small and large commercial sector for the PRB in Wyoming. These forecasts are derived by the use of econometric models, as well as upcoming coal projects and services.

The coal production and energy forecasts for Western North Dakota's coal fields are judgmental forecasts based on the estimated production of the mines located in Mercer County that supply Basin Electric's Antelope Valley Station and the Leland Olds Station, and the Dakota Gasification Company.

Coal Bed Methane Load. A major load development is also occurring in Northeastern Wyoming. This load is related to the extraction of methane gas that is contained in the sub-bituminous coal reserves located within one of Basin Electric's member service territory.

Coal bed methane (CBM) loads were first considered in the 1998 Power Requirements Study (PRS). At that time only limited activity was taking place and the forecast was not particularly significant. By 2000, the CBM play was more active and therefore a more comprehensive forecast was conducted in-house by Basin Electric staff and was included in the January 1, 2001, PRECorp Load Forecast.

After the 2001 PRECorp Load Forecast was completed, the Bureau of Land Management (BLM) was required to prepare an environmental impact statement (EIS), which essentially put a freeze on further drilling on federal leases until the record of decision (ROD) was finalized. It was also felt a more thorough, comprehensive, and independent forecast should be conducted. Therefore, PACE Global Energy Services (PACE) was retained after a careful review of many consultants, to develop the next PRECorp CBM forecast. PACE completed four consecutive CBM load forecasts for Basin Electric. Basin Electric also participated with other companies in a Pace Global Energy Services Wyoming Pipeline Study in 2003.

Since the CBM load had been thoroughly researched and developed by external consultants for four consecutive load forecasts, when there was not as much CBM development and little historical data, it was decided the 2009 CBM load forecast could be developed internally. Basin Electric continues to develop the CBM load forecast internally. The use of the IHS Global Database and forecasting software was necessary to create econometric models based on historical data to forecast with. This is the same software and databases that were used in the oil load forecasting process.

One of the main drivers of such a forecasting process was to develop a CBM well drilling forecast, as well as the company plans for the larger CBM loads such as water pumping and large gas compressors. Therefore, Basin Electric and PRECorp held joint conference calls with the major CBM producers to get their opinions and outlook for their companies and the industry as a whole.

After the development of 12 regional econometric equations based on PRECorp historical CBM energy data, IHS Global data, projected company drilling plans and other factors, such as water and gas production (from IHS Global), were applied to the equations to develop forecasts of existing and new CBM loads. All existing loads were included in the historical load data for model development; therefore, any projected loads will include the same ratio of smaller water gathering or treatment, as well as any field gas gathering type of loads. New large loads, such as water pipelines (>1000 HP) and large gas compressors obtained from the company

plans were added judgmentally to these modeled and projected forecasts to produce a total CBM load forecast for PRECorp.

Also a great assistance for data and information was obtained from the Wyoming Oil and Gas Commission website. They track and post a variety of monthly CBM data.

Ethanol and Bio-Diesel Related Commercial Load. The ethanol sector loads were judgmentally projected by the distribution members that have had contact with the companies planning new plants or expansion of existing facilities.

Other retail sectors that are considered when compiling the distribution forecasts follow.

Other Commercial Load Forecasts. Those commercial loads that are not oil or coal related are generally prepared using trending and sometimes judgmental forecasts. These forecasts that consider past trends and expected future developments reflect the knowledge and expertise the local cooperatives have of their service territories.

Irrigation. Irrigation sales fluctuate during the historical periods due to the weather, the state of the farm economy, and government programs. Trending models were used to forecast consumers and energy.

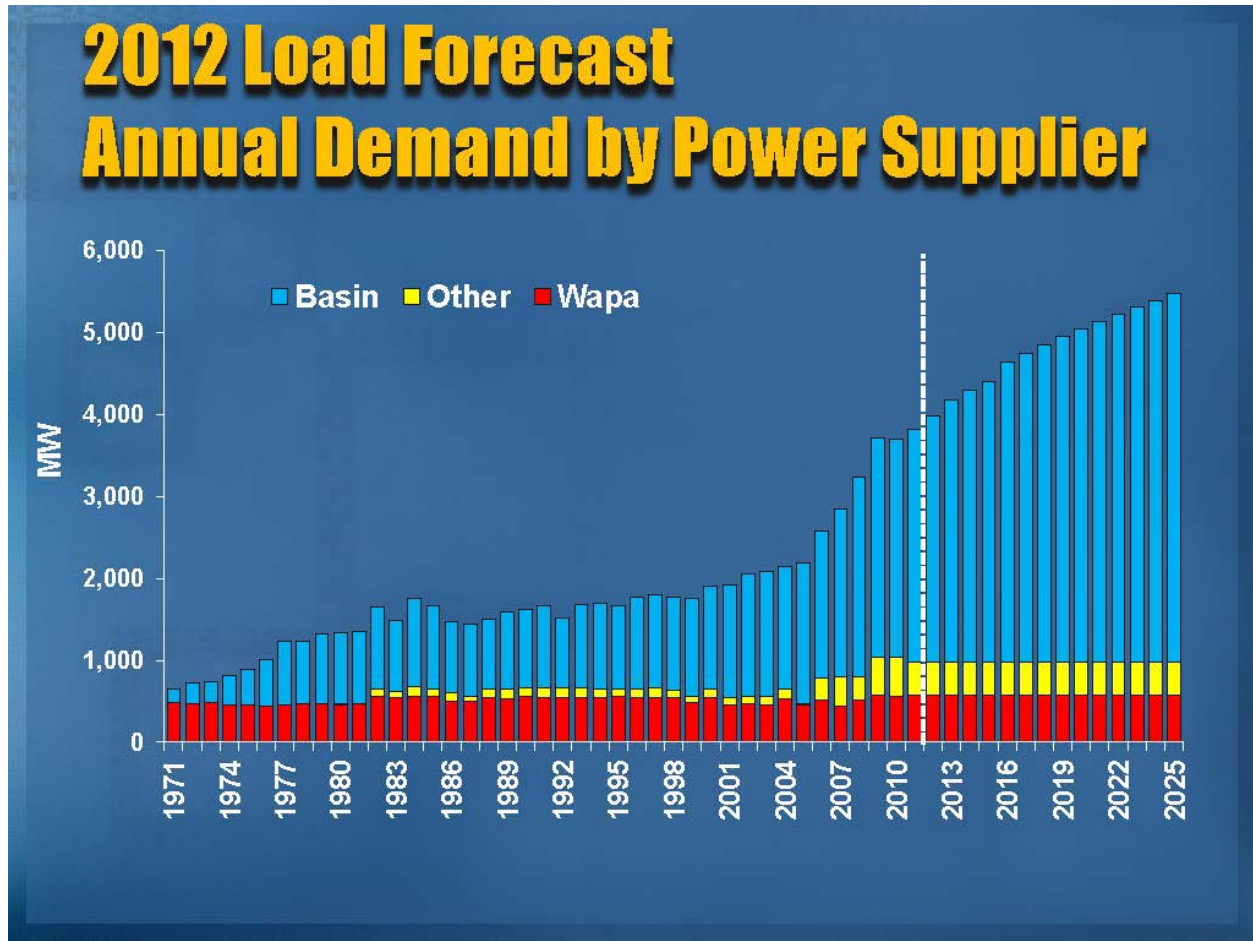
Other Sales. These represent sales to categories such as Public Street and highway, public authorities, and other RUS borrowers. These sales, which are usually quite small, are forecasted using trending models.

Losses. The forecasted sales for each of the previous consumer categories are on an at-load basis, meaning the sales represent the amount of power delivered to the retail consumers. One of the objectives of the load forecast process is to obtain a forecast of the distribution cooperative's wholesale power requirements at its substations. These requirements, which correspond to their purchases, are obtained by increasing the distribution cooperative sales to reflect their own use, as well as system losses occurring on its transmission and substation facilities. Own use and losses are represented together as a percent of purchases. An estimate is derived by considering historical percentages and planned improvements to the cooperative's distribution system that would affect the amount of future losses.

1.4.2.2 Basin Electric: Baseline Supplemental Deliveries

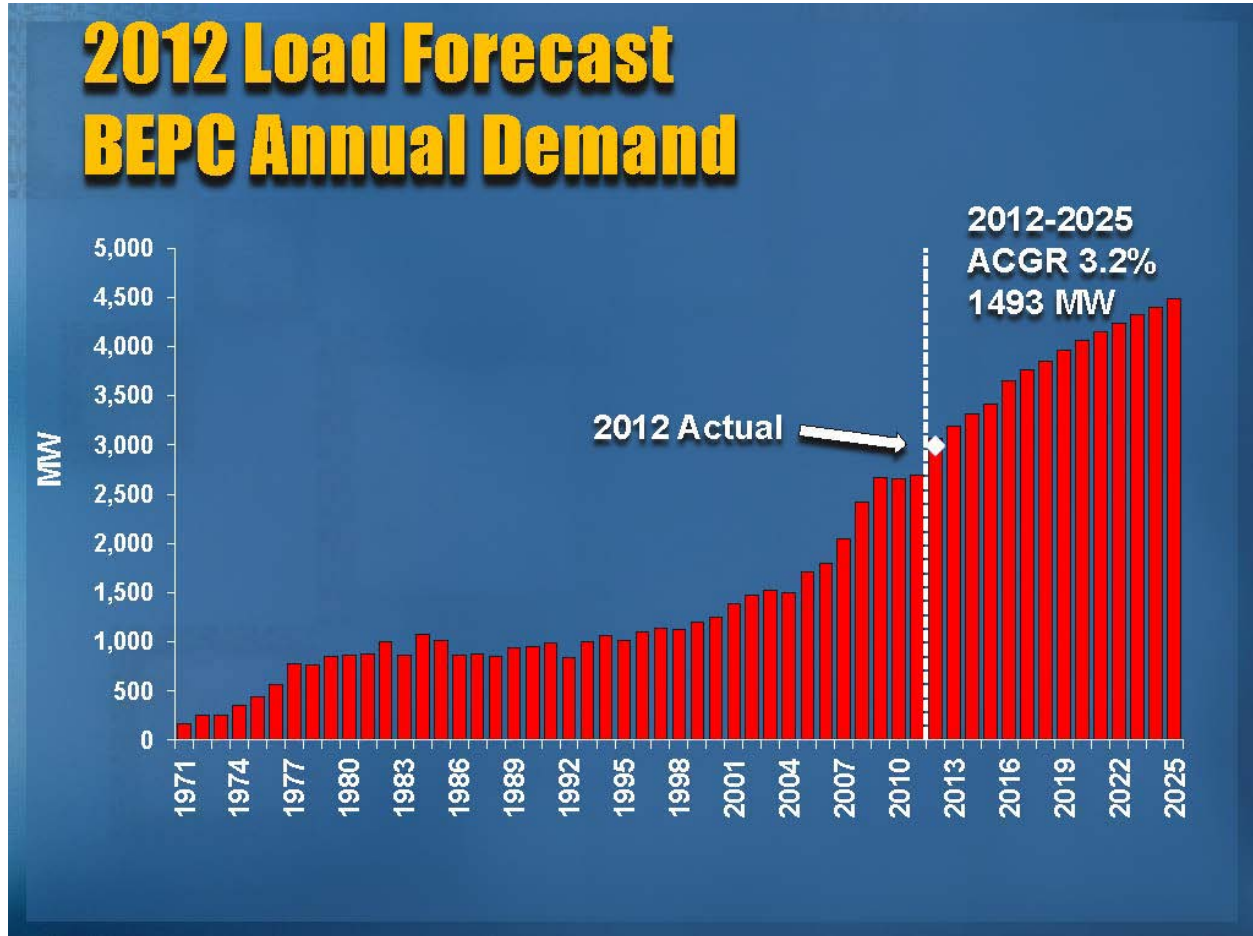
Basin Electric's supplemental power supply responsibility to its member systems is, in most cases, computed by subtracting the members' direct Western allocation from their total power requirements. In instances where other power supply sources are applicable, contractual arrangements are considered.

Exhibit 1.4-6. Annual Demand



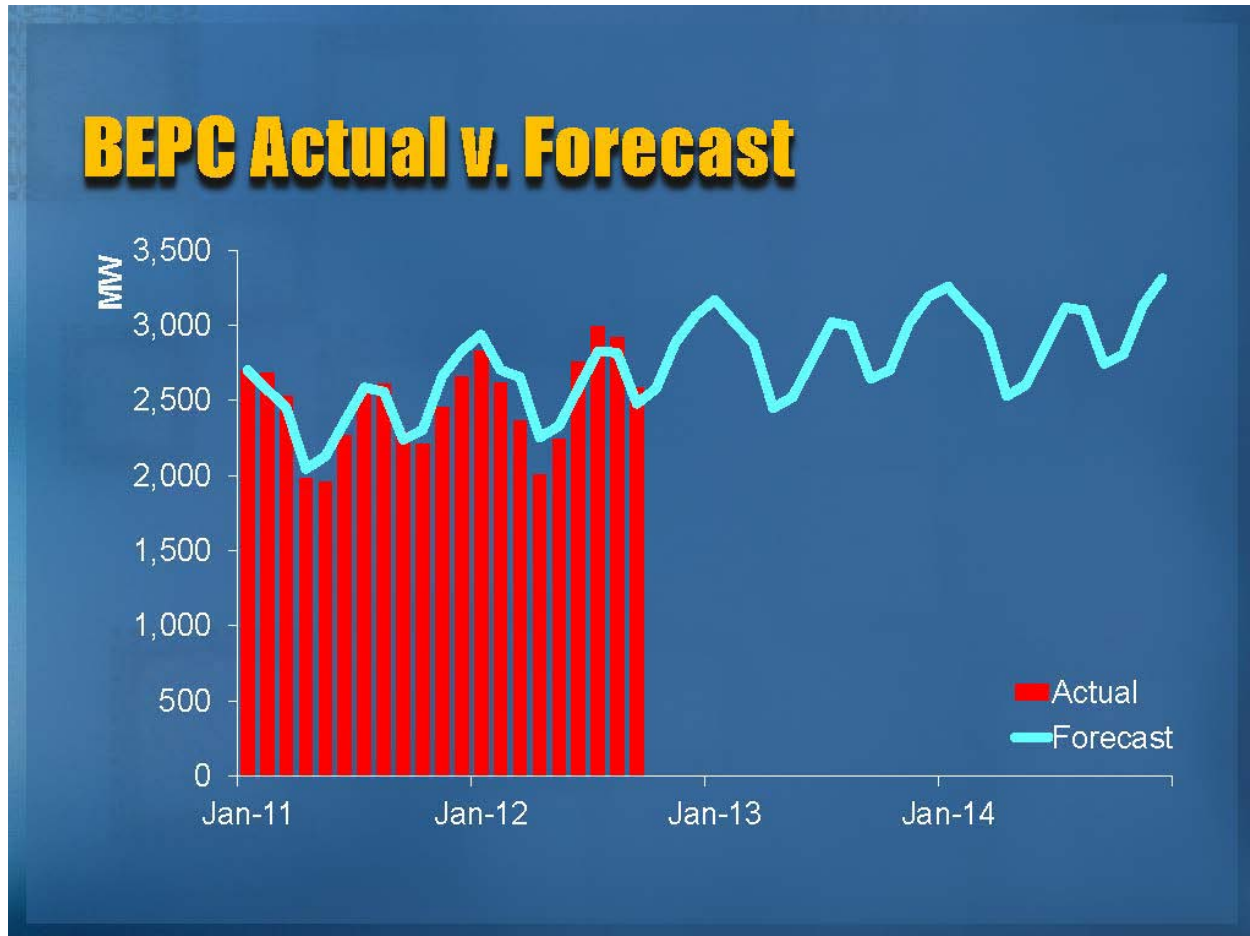
After other power suppliers obligations are considered, the remainders of the loads are Basin Electric's responsibility. The following graph (Exhibit 1.4-7) depicts the expected Annual Demands for Basin Electric.

Exhibit 1.4-7. Basin Electric



The following graph (Exhibit 1.4-8) depicts the performance of the 2012 Load Forecast. Significant growth is expected to continue in the future. Summer 2012 actual peak load was 167 MW or 5.9% above the weather normalized forecast.

Exhibit 1.4-8. Forecast Performance



1.4.2.3 Basin Electric Generation Resources

Basin Electric's service area is electrically divided into western and eastern systems. These systems are separated by the east-west ties, which are boundaries that separate two major electrical regions of the United States. This boundary essentially runs south from Fort Peck, MT, approximately following the South Dakota-Wyoming, Nebraska-Wyoming, and Colorado-Kansas borders. As a result of this, Basin Electric must supply generating capacity and energy on both sides of the ties to serve its member-load requirements.

To move power from one side of the east-west boundary to the other AC-DC-AC ties can be constructed. Basin Electric currently has capacity rights on three ties, Miles City DC Tie, the Stegall DC tie and the Rapid City DC tie.

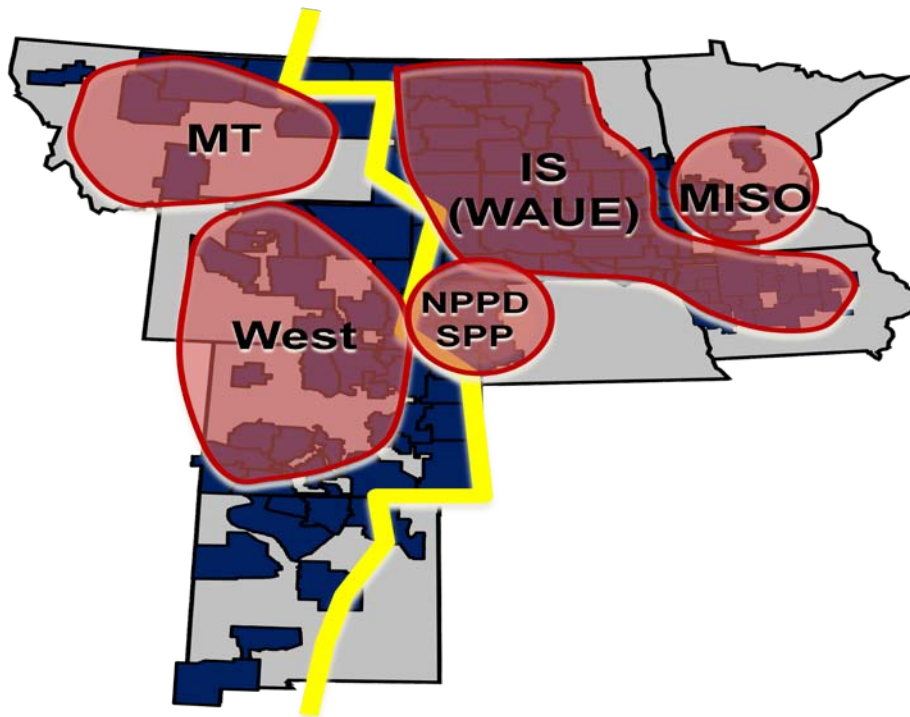
Basin Electric and the Western Area Power Administration (WAPA) jointly constructed a 200 MW back-to-back, AC-DC-AC tie in the Miles City, MT area. Basin has an 183MW capacity entitlement on this tie in the

East-to-West transfer direction. This tie enables Basin Electric to serve electrical loads located on the west using capacity from the east side resources.

Basin Electric and Black Hills Power, Inc. have jointly constructed a 200 MW asynchronous tie in the Rapid City, SD area. The Basin Electric ownership percentage is 65% and the Black Hills Power, Inc. ownership percentage is 35%. Basin Electric has a 130 MW capacity entitlement on this tie either the East-to-West transfer direction or the West-to-East transfer direction.

Tri-State constructed an 110MW asynchronous tie in the Stegall, NE area. Basin Electric leases all the contractual rights across the tie. Basin Electric has a 110 MW capacity entitlement on this tie either the East-to-West transfer direction or the West-to-East transfer direction.

Exhibit 1.4-9. Basin Electric's Service Area



Basin Electric's service area is also divided five different planning areas (Exhibit 1.4-9). These areas are the WAUE (WAPA, Upper Great Plains Region, East), Midwest Independent Transmission System Operator (MISO), Southwest Power Pool (SPP), Montana and West.

The WAUE, MISO and SPP planning areas are served from those resources located on the east side of the tie boundary and by various long term and short term purchase power contracts. Those resources on the east are listed as “East Side Resources,” see below.

The Montana planning area is served from the AC-DC-AC tie built at Miles City, MT. Generation on the East is used to serve load the Montana planning area.

The West planning area is served from those resources located on the west side of the tie boundary. Those resources on the west are listed as “West Side Resources,” see below.

East Side Resources:

1. Leland Olds Station: Leland Olds Unit 1 was placed in-service on January 9, 1966 and is a base-load thermal unit located near Stanton, ND with a net capacity of 222 MW. Leland Olds Unit 2 was placed in-service on December 15, 1975 with a net capacity of 447 MW. Basin Electric has committed to install emission control equipment at the Leland Olds Station which requires an increase to the station service. This equipment is anticipated to be installed in the fall of 2012 for Unit 2 and the spring of 2013 for Unit 1.
2. Western Area Power Administration Peaking Capacity: In 1968 Basin Electric executed a long-term contract with the federal government for USBR (now WAPA) hydro peaking from the dams in the Missouri River Basin. This contract currently provides Basin Electric with 268.2 MW of winter peaking capacity at load, whereas an at-plant value includes losses on the Integrated System (IS).
3. Spirit Mound Station: Basin Electric placed in service two 60 MW (net) nameplate oil-fired combustion turbines on June 30, 1978. The combined winter rating of the two units is 120 MW (net) and the summer rating is 100 MW (net). The capacity is intended to be used primarily as reserves or replacement during initial outages of base-load units or during peak load periods when existing base-load units cannot meet the demand. The Spirit Mound Station is located near Vermillion, SD.
4. Laramie River Station: Basin Electric, together with five other consumer-owned power supply entities, began construction of the Laramie River Station near Wheatland in southeast Wyoming in July, 1976. The station's three units became fully operational on November 1, 1982, with Unit 1 at a net capacity of 570 MW; Unit 2 at a net capacity of 570 MW; and Unit 3 at a net capacity of 570 MW. The current rating of the units is due to turbine upgrades that occurred in 2007, 2008 and 2009. Basin Electric, as Project Manager and Operating Agent for the Missouri Basin Power Project, was assigned overall responsibility for the design, construction and operation of the power plant and related transmission. Units 2 and 3 of the Laramie River Station are electrically connected to the western system; Unit 1 is electrically connected to the eastern system. The amount of power Basin Electric receives from the eastern unit is 48 MW (net).
5. Antelope Valley Station: Basin Electric operates two 450 MW (net) thermal-generating units near Beulah, ND. Approximately 135+ MW of electric power for the Dakota Gasification Company Synfuels Plant facilities are supplied by the Antelope Valley Station. Unit 1 began commercial operation on July 1, 1984 and Unit 2 began partial commercial operation on June 1, 1986.
6. Neal IV: Basin Electric and Northwest Iowa Power Cooperative (NIPCO), one of Basin Electric's member cooperative, negotiated a power supply contract which provides that NIPCO will sell to Basin Electric NIPCO's 31 MW of uncommitted capacity and associated energy from Unit No. 4 of the George Neal Generating Station (Neal IV). In return NIPCO entered into a wholesale power contract with Basin Electric whereby Basin Electric will sell and deliver to NIPCO all of NIPCO's capacity and energy requirements in excess of the power and energy available to NIPCO from the Western Area Power Administration.

Basin Electric and Corn Belt Power Cooperative (Corn Belt), one of Basin Electric's member cooperatives, negotiated a power supply contract which provides that Corn Belt will sell to Basin

Electric Corn Belt's 73 MW of uncommitted capacity and associated energy from Unit No. 4 of the George Neal Generating Station (Neal IV). In return, Corn Belt entered into a wholesale power contract with Basin Electric whereby Basin Electric will sell and deliver to Corn Belt all of Corn Belt's capacity and energy requirements in excess of the power and energy available to Corn Belt from the Western Area Power Administration.

7. Chamberlain Wind Project: Basin Electric, in partnership with East River Power Cooperative, has constructed a wind energy project near Chamberlain, South Dakota. The 2.6 megawatt capacity project was placed into commercial service in January 2002. The energy is delivered to members as part of Basin Electric's overall power supply.
8. Minot Wind Project: Basin Electric, in partnership with Central Power Electric Cooperative, has constructed a wind energy project 14 miles south of Minot, North Dakota. The 2.6 megawatt capacity wind project was placed into commercial service in February 2002. Three additional turbines were added in December 2009 for a total output of 7.1 megawatts. The energy is delivered to members as part of Basin Electric's overall power supply.
9. PrairieWinds 1: Basin Electric, in partnership with PrairieWinds ND 1 Inc., has constructed a wind energy project of 77 turbines near Minot, North Dakota. The 115.5 MW capacity wind project was placed into commercial service in December, 2009.
10. Crow Lake Wind Project: Basin Electric, in partnership with Prairie Winds SD1 Inc., South Dakota Wind Partners and Mitchell Technical Institute, has constructed a wind energy project of 108 turbines near White Lake, South Dakota. The 162 MW capacity wind project was placed into commercial service. Basin Electric's subsidiary, Prairie Winds SD1, owns 100 turbines or 150 MW. Basin Electric has a purchase power contract for all 108 turbines or 162 MW from the Crow Lake Wind Project.
11. Walter Scott 3 and 4: Basin Electric and Corn Belt Power Cooperative (Corn Belt), one of Basin Electric's member cooperatives, negotiated a power supply contract which provides that Corn Belt will sell to Basin Electric Corn Belt's 26 MW of uncommitted capacity and associated energy from Unit No. 3 and 45 MW of uncommitted capacity and associated energy from Unit No. 4 of the Walter Scott Energy Center. In return, Corn Belt entered into a wholesale power contract with Basin Electric whereby Basin Electric will sell and deliver to Corn Belt all of Corn Belt's capacity and energy requirements in excess of the power and energy available to Corn Belt from the Western Area Power Administration.
12. Duane Arnold Energy Center: Basin Electric and Corn Belt Power Cooperative (Corn Belt), one of Basin Electric's member cooperatives, negotiated with a power supply contract which provides that Corn Belt will sell to Basin Electric Corn Belt's 62 MW of uncommitted capacity and associated energy from the Duane Arnold Energy Center. In return, Corn Belt entered into a wholesale power contract with Basin Electric whereby Basin Electric will sell and deliver to Corn Belt all of Corn Belt's capacity and energy requirements in excess of the power and energy available to Corn Belt from the Western Area Power Administration.
13. Wisdom Unit 1: Basin Electric and Corn Belt Power Cooperative (Corn Belt), one of Basin Electric's member cooperatives, negotiated a power supply contract which provides that Corn Belt

will sell to Basin Electric Corn Belt's 38 MW of uncommitted capacity and associated energy from the Earl F. Wisdom Unit 1. In return, Corn Belt entered into a wholesale power contract with Basin Electric whereby Basin Electric will sell and deliver to Corn Belt all of Corn Belt's capacity and energy requirements in excess of the power and energy available to Corn Belt from the Western Area Power Administration.

14. Wisdom Unit 2: Basin Electric partnered with Corn Belt Power Cooperative to build the 80 MW natural gas peaking unit near Spencer, Iowa. Basin Electric owns one half of the unit, which was placed in service in April 2004. Basin Electric purchases 87.5 % of Corn Belt's owned half in response to Corn Belt entering into a Wholesale Power Contract.
15. Groton Generation Station: Basin Electric commissioned Groton Unit 1 in 2006 and Unit 2 in 2008. These units provide peaking power. They each have winter ratings of 100 MW.
16. Culbertson Generation Station: Basin Electric commissioned Culbertson Unit 1 in 2010. The unit provides peaking power. The unit has a winter rating of 100 MW.
17. Other Short-Term Resources: Basin Electric has also entered into a number of short-term purchase agreements to meet contractual power supply obligations. Due to the relatively short duration of these arrangements no specifics are provided.
18. Long-Term Resource: Basin Electric has entered into a long-term purchase agreement with NextEra Energy Resources to meet contractual power supply obligations. A 40 megawatt wind energy project is located just west of Edgeley, ND; two 49.5 MW wind energy projects are located near Wilton, ND; a 40 megawatt wind energy project is located near Highmore, SD; a 99 MW wind energy project is located near Groton, SD; and a 100 MW wind energy project is located near Baldwin, ND. Basin Electric also entered into a long-term purchase agreement with the City of Madison which provides 10 MW of peaking power from a diesel unit at Madison, SD. Basin Electric has a purchase power agreement with Ormat Industries for eight 5.5 MW waste heat recovery units. Three sites are in North Dakota near St. Anthony, Manning, and Zeeland. Three sites are in South Dakota, one in Montana and one in Minnesota. Basin Electric also purchases the output from the following generating facilities from its member cooperative Corn Belt, 25 MW from the Webster City, IA combustion turbine; 13 MW from the diesel generators at Estherville, IA; 3.8 MW from the diesel generators at Pocahontas, IA; 10 MW from the combustion turbine located at Spencer, IA; and from the following wind generating projects, 7.3 MW of Hancock County, 16.8 MW of Crosswinds, 10.5 MW from Lakota and 10.5 MW from Superior, all located within Iowa. Basin Electric also has long term purchases from Minnesota Power for 100 MW and 30 MW from Municipal Energy Agency of Nebraska.
19. Deer Creek Station: Basin Electric developed the Deer Creek Station (300 MW) combined-cycle natural gas facility, located near White, SD. This unit went commercial on August 1 of 2012.
20. Future Power Supply: Basin Electric is developing a 45MW natural gas fired combustion turbine located near Williston, North Dakota. This project is named "Pioneer Generation Station" (PGS) and the projected in-service date is the spring of 2013. Basin Electric is also developing a 45 MW

natural gas fired combustion turbine located near Watford City, North Dakota. This project is named “Lonesome Creek Station” (LGS) and the projected in-service date is the spring of 2013.

West Side Resources:

1. Laramie River Station: The Laramie River Station capacity that Basin Electric will receive from the two west-side units is 675 MW (net).
2. Wyoming Distributed Generation: The Wyoming Distributed Generation consists of 9 units located at 3 sites; Arvada, Hartzog and Barber Creek. These units are natural gas fired units with a total net output of 45 MW summer and 54 MW winter.
3. Dry Fork Station: The Dry Fork Station is a 390 MW (net) coal fired power plant located 10 miles north of Gillette, Wyoming. Basin Electric owns 92.9% of the station

1.4.2.4 Basin Electric Loads and Capabilities

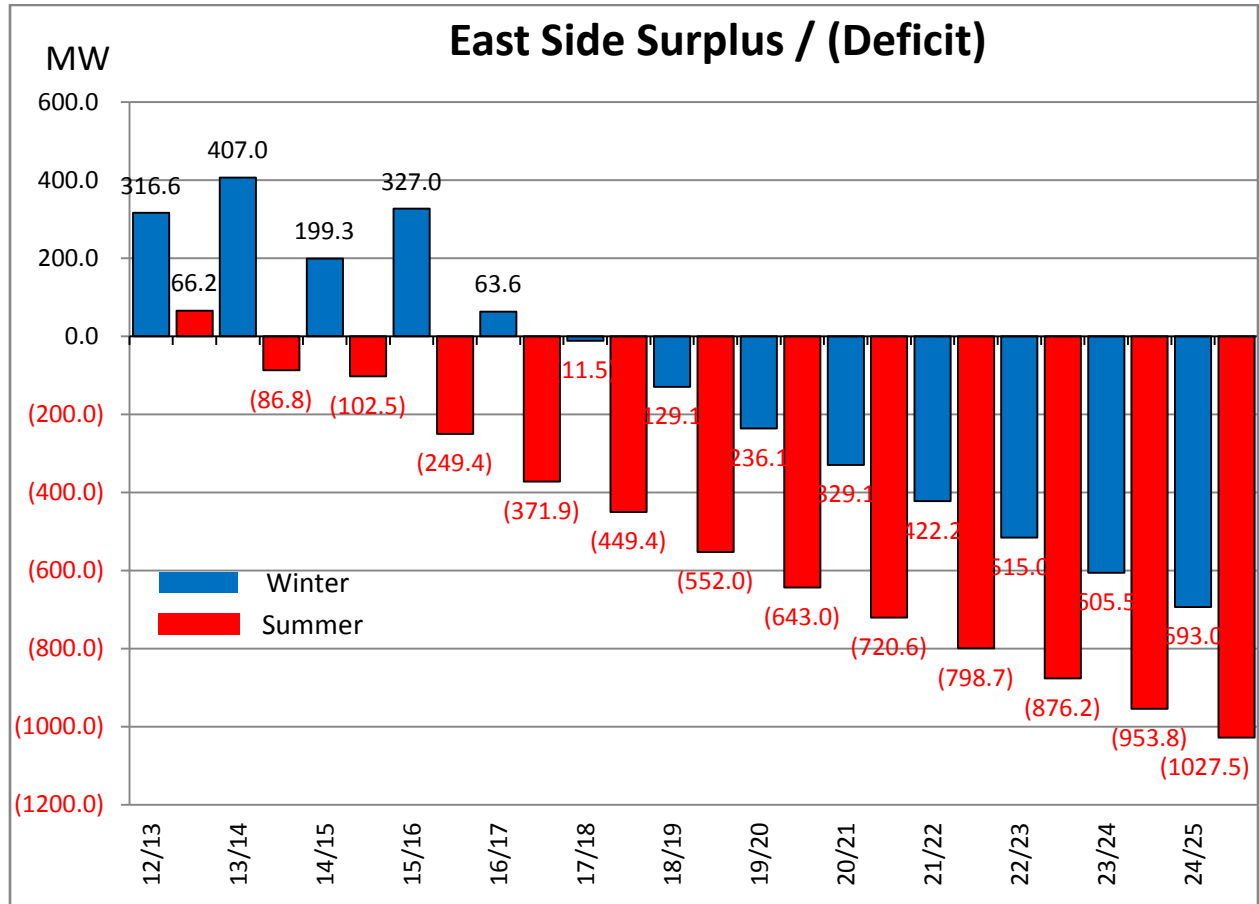
Basin Electric's Loads are determined by adding up the forecasted loads, as described above, any power sales, transfers, reserve obligations and applicable losses to create a total load obligation.

Basin Electric's Capabilities are determined by adding the capacity of all Basin Electric's owned facilities, as described above, capacity purchases and firm purchases to create a total resource capability.

The total load obligation is then compared against the total resource capabilities by season and year, to determine if the system is surplus or deficit. The chart associated with the Loads and Capabilities is called a Surplus/Deficit Graph.

Basin Electric is going to focus on the East Side Loads and Capabilities (Exhibit 1.4-10), as it is this area that is showing the greatest growth in the current load forecast.

Exhibit 1.4-10. East Side Surplus



1.4.3 Need for facility

Upon completion of the load forecast and through power supply planning activities, Basin Electric has identified the need for additional electric generation to meet its growing member load requirements. This 2012 Load Forecast Update identified that Basin Electric's membership is forecasted to grow more than 1,500 MW between 2012 and 2025; with more than 1,000 MW of this anticipated load growth related to oil development within the Williston Basin area of North Dakota and Montana. At the time of this submittal Basin Electric is still awaiting the results of the independent third party Load Forecast for the Williston Basin oil and gas loads. The results of this study could impact Basin Electric's current load forecast and the speed with which these forecasted loads are to come on to the system. Basin Electric's overall power supply needs will be incorporated into its Integrated Resource Plan which is anticipated to be completed in early 2013.

Basin Electric is forecasted to be short of generation capacity starting in 2014. This capacity need has been determined to be best supplied by developing additional simple-cycle combustion turbine technology at the PGS that provides flexibility of load dispatching in efficient incremental stages. In doing so, Basin Electric will receive the generation capacity it requires to reliably serve its load serving obligations.

By installing similar combustion turbines at the existing Pioneer Generating Station (PGS) site, Basin Electric will benefit from eliminating the additional costs associated with developing a new site, such as land acquisition, pipeline and transmission costs, staffing, spare parts, etc. PGS is located within the heart of the Williston Basin and will provide additional reliability benefits during transmission outages, system-wide generation shortfalls and provide for the contingency if the load in the Williston Basin region grows faster than is currently forecasted. The operation of a 45 MW combustion turbine provides the added benefit of operating in a more efficient operating zone, than a larger combustion turbine. A larger 80 to 100 MW combustion turbine has an increased likelihood of being operated at half-load and thus, a less efficient operating level.

1.4.4 Cost

The cost of construction for PGS Phase II is estimated to be approximately \$102 million.

1.4.5 Alternatives

PGS Phase II is being proposed for this site because there is existing infrastructure available at the Pioneer Generation Station. No other alternatives are being considered because development at a new 'greenfield' site would result in additional cost and environmental impacts.

1.4.6 Ten-Year Plan

Basin Electric filed a Ten-Year Plan with the Commission on June 25, 2012. PGS Phase II is consistent with the Ten-Year Plan on file with the Commission.

1.4.6.1 Waiver Request

A waiver of procedures and a timely review of the application is needed in order to prevent potentially significant delays in this project. As set forth in Section 1.6 of the Application, PGS Phase II is proposed to be in operation in July 2014 in order to meet the projected need. Section 49-22-07.2 of the Act provides that the PSC may waive procedures and time schedules upon a finding that "the proposed facility is of such length, design, location, or purpose that it will produce minimal adverse effects." Based upon the thorough

investigation and analysis set forth in this Application, waivers are appropriate because the proposed facility will produce minimal adverse effects.

Basin Electric is requesting to waive requirements for Mylar maps and stereo-pair aerial photographs as set forth in the PSC’s Application Guidelines. Waiving these requirements will have no adverse effects. Basin Electric will be submitting Geographic Information System (GIS) developed maps in the Application.

1.5 Certificate of Site Compatibility

Table 1.5-1 outlines the information required in the North Dakota Century Code Title 49, Chapter 22, Section 08- 09: Energy Conversion and Transmission Facility Siting Act.

Table 1.5-1. Certificate of Site Compatibility Completion Checklist

State Authority	Description	Section
Chapter 49-22-08	PSC Energy Conversion and Transmission Facility Siting	Guidelines:
Section A	Description	1.0
1.	Type: Describe the type of facility addressed in this application. The description shall include the purpose of the facility and the technology to be employed.	1.2
2.	Product: Describe the type, source, and final destination of the product to be transmitted by the proposed facility.	
3.	Size and Design.	1.2
4.	Location of any new facility.	1.0
a.	Provide a description of the size and design of the pipeline facility including, but not limited to, the following:	NA
5.	Time Schedule: Provide the anticipated time schedule for the accomplishment of the following events:	1.3
a.	Certificate of Site Compatibility; (1.5, Table 1.3-1)	
b.	Site Application; (1.6)	
c.	Site Permit;(1.4-1	
d.	Construction start date;	
e.	Construction complete; and	
f.	In-service date.	
Section B	Studies	Appendix A
Section C	Need for Facility	
1.	An analysis of the need for the proposed facility based on present and projected demand for the product to be transmitted by the facility, including the most recent system studies supporting the analysis of the need.	1.4
2.	A description of any feasible alternative methods of serving the need.	1.4.1
3.	A statement justifying any deviations from the most recent Ten-Year Plan which the proposed facility may present.	1.4.2
Section D	Location	

State Authority	Description	Section
1.	Identify and map the criteria that led to the proposed site location within the study area.	Figure 1 and Figure 2
2.	Discuss the relative value of each criteria and how the proposed corridor location was selected giving consideration to all criteria.	2.3
3.	The criteria to be evaluated shall include at a minimum all of the following which are within the study area:	
a.	Exclusion areas;	2.1, Table 2.1-1
b.	Avoidance areas;	2.2, Table 2.2-1
c.	Selection criteria;	2.3, Table 2.3-1
d.	Policy criteria;	2.4, Table 2.4-1
e.	Design and construction limitations; and	2.5
f.	Economic considerations.	2.6
5.	Discuss the general mitigative measures that will be taken to minimize adverse impacts	4.2.3, 4.3.3, 4.4.3, 4.5.3, 4.6.3, 4.7.3, 4.8.3, 4.9.3, 4.10.3, 4.11.3, 4.12.3, 4.13.3, 4.14.3, 4.15.3, 4.16.3, 4.17.3, 4.18.3
6.	List the qualifications of the people in the various disciplines that contributed to the corridor location study.	9.0
7.	Maps	
a.	Map the criteria within the site area. Several different criteria may be shown on each map, depending on the map scale and the density and nature of the criteria. Minimum map scale shall be ½ inch = 1 mile. All maps shall be at the same scale unless otherwise specified.	Figures
b.	Furnish one set of Mylar maps, separate from the application, of the same scale as the criteria maps and showing the same basic features as the criteria maps, including the study area, but not the proposed facility location.	
Chapter 49-22-09	Factors to be considered in evaluating applications and designation of sites, corridors, and routes.	7.0
1.	Available research and investigations relating to the effects of the location, construction, and operation of the proposed facility on public health and welfare, natural resources, and the environment.	4.0, 7.1, & Appendix A
2.	The effects of new energy conversion and transmission technologies and systems designed to minimize adverse environmental effects.	7.2
3.	The potential for beneficial uses of waste energy from a proposed energy conversion facility	7.3
4.	Adverse direct and indirect environmental effects which cannot be avoided should the proposed site or route be designated.	7.4
5.	Alternatives to the proposed site, corridor, or route which are developed during the hearing process and which minimize adverse effects.	NA
6.	Irreversible and irretrievable commitments of natural resources should the proposed site.	7.5
7.	The direct and indirect economic impacts of the proposed facility	7.6

State Authority	Description	Section
8.	Existing plans of the state, local government, and private entities for other developments at or in the vicinity of the proposed site.	7.7
9.	The effect of the proposed site on existing scenic areas, historic sites and structures, and paleontological or archaeological sites.	7.8
10.	The effect of the proposed site on areas which are unique because of biological wealth or because they are habitats for rare and endangered species	7.9 , 7.10
11.	Problems raised by federal agencies, other state agencies, and local entities	7.11

1.6 Site Application

Table 1.6-1 below outlines the information required in the PSC Guidelines dated November 1979 for a Site Compatibility Permit.

Table 1.6-1. Table Site Permit Completion Checklist

State Authority	Description	Section
Chapter 49-22-08	PSC Energy Conversion and Transmission Facility Siting	Guidelines:
Section A	Description	1.0
1.	Type: Describe the type of transmission facility proposed.	1.2
2.	Product: Describe the product or products to be transmitted.	
3.	Size and Design: Provide a general description of the proposed size and design, and any alternate size or design, which was considered. Provide one (1) copy of the design data report, separate from the application, for the proposed facility and any associated facilities.	
4.	Time Schedule: Provide the anticipated time schedule for the accomplishment of major events including, at a minimum, the following:	1.3
a.	Site Permit;	
b.	Construction start date;	
c.	Construction complete;	
d.	Test operations; and	
e.	In-service date.	
Section B	Studies	
	Provide a copy of any evaluative studies or assessments of the environmental impact of the proposed facility submitted to any federal, regional, state, or local agency.	Appendix A
Section C	Need for Facility	
1.	An analysis of the need for the proposed facility based on present and projected demand for the product to be transmitted by the facility, including the most recent system studies supporting the analysis of the need.	1.4
2.	A description of any feasible alternative methods of serving the need.	1.4.1

State Authority	Description	Section
3.	A statement justifying any deviations from the most recent Ten-Year Plan which the proposed facility may present.	1.4.2
Section D	Location	
1.	Discuss the utility's policies and commitments to limit the environmental impact of its facilities, including copies of board resolutions and management directives.	4.0
2.	Discuss the factors listed in Section 49-22-09, NDCC to aid the PSC's evaluation of the proposed route.	7.0
3.	Discuss in detail the relative value of each criteria and how the location, construction, and operation of the facility will affect each criteria.	2.0
4.	The criteria to be evaluated shall include at a minimum all of the following which are within the designated site:	
a.	Exclusion areas;	2.1, Table 2.1-1
b.	Avoidance areas;	2.2, Table 2.2-1
c.	Selection criteria;	2.3, Table 2.3-1
d.	Policy criteria;	2.4, Table 2.4-1
e.	Design and construction limitations; and	2.5
f.	Economic considerations.	2.6
6.	Discuss the mitigative measures that will be taken to minimize adverse impacts which result from the location, construction, and operation of the proposed facility.	4.2.3, 4.3.3, 4.4.3, 4.5.3, 4.6.3, 4.7.3, 4.8.3, 4.9.3, 4.10.3, 4.11.3, 4.12.3, 4.13.3, 4.14.3, 4.15.3, 4.16.3, 4.17.3., 4.18.3
7.	List the qualifications of the people in the various disciplines that contributed to the facility route location study.	9.0
8.	Maps	Figures
a.	Map the criteria within the site. Several different criteria may be shown on each map, depending on the map scale and the density and nature of the criteria. Minimum map scale shall be ½ inch = 1 mile. All maps shall be at the same scale unless otherwise specified.	
b.	Furnish one (1) set of Mylar maps, separate from the application, of the same scale as the criteria maps and showing the same basic features as the criteria maps, including the designated corridor, but not the proposed route or location of any new associated facilities.	
c.	Furnish one (1) set of uncontrolled 9x9 inch stereo-pair aerial photographs, separate from the application, with acceptable resolution showing the designated corridor, proposed route and location of any new associated facilities, and Section, Township and Range numbers, at a scale of 1 inch = 2,000 feet, together with a flight map at a scale of ½ inch = 1 mile showing each flight line and the beginning and ending photo number of each flight line. Photo mosaic strip maps will also be acceptable. If the applicant can demonstrate that because of the limited size and scope of the project, aerial photographs would not be practical, this requirement may be waived.	
Chapter 49-22-09	Factors to be considered in evaluating applications and designation of sites, corridors, and routes.	7.0

State Authority	Description	Section
1.	Available research and investigations relating to the effects of the location, construction, and operation of the proposed facility on public health and welfare, natural resources, and the environment.	4.0, 7.1, & Appendix A
2.	The effects of new energy conversion and transmission technologies and systems designed to minimize adverse environmental effects.	7.2
3.	The potential for beneficial uses of waste energy from a proposed energy conversion facility	7.3
4.	Adverse direct and indirect environmental effects which cannot be avoided should the proposed site.	7.4
5.	Alternatives to the proposed site which are developed during the hearing process and which minimize adverse effects.	NA
6.	Irreversible and irretrievable commitments of natural resources should the proposed site be designated.	7.5
7.	The direct and indirect economic impacts of the proposed facility	7.6
8.	Existing plans of the state, local government, and private entities for other developments at or in the vicinity of the proposed site.	7.7
9.	The effect of the proposed site or route on existing scenic areas, historic sites and structures, and paleontological or archaeological sites.	7.8
10.	The effect of the proposed site or route on areas which are unique because of biological wealth or because they are habitats for rare and endangered species	7.9, 7.10
11.	Problems raised by federal agencies, other state agencies, and local entities	7.11

2 Site Compatibility Criteria

This part of the permit application includes an inventory and suitability analysis of criteria listed in NDAC Section 69-06-08-02, including exclusion and avoidance area criteria; selection criteria that relate to minimizing potential land use and environmental impacts; policy criteria that relate to maximizing public benefits; and design and construction limitations. Basin Electric has also included economic considerations as part of the analysis.

2.1 Exclusion Areas

NDAC Section 69-06-08-02-1 states that exclusion areas shall be excluded in the consideration for a site. A buffer zone of a reasonable width to protect the integrity of the area shall be included. Natural screening may be considered in determining the width of the buffer zone.

Table 2.1-1. Exclusion Areas

Exclusion Area	Present within the site	Section Addressed
a. Designated or registered national: parks; memorial parks; historic sites and landmarks; natural landmarks; monuments; wilderness areas.	Not Present	4.10
b. Designated or registered state: parks; historic sites; monuments; historical markers; archaeological sites; and nature preserves.	Not Present	
c. County parks and recreational areas; municipal parks; and parks owned or administered by other governmental subdivisions.	Not Present	
d. Areas critical to the life stages of threatened or endangered animal or plant species	Not Present	4.18
e. Areas where animal or plant species that are unique or rare to this state would be irreversibly damaged	Not Present	

2.2 Avoidance Areas

Per NDAC Section 69-06-08-02-2, the following geographical areas (As indicated in Table 2.1-1) shall not be considered in selecting a site unless the applicant shows that under the circumstance there is no reasonable alternative. In determining whether an avoidance area should be designated for a facility, the PSC may consider, among other things, proposed management of adverse impacts; orderly siting of facilities; system reliability and integrity; efficient use of resources; and alternative routes. Economic considerations alone shall not justify approval of these areas. A buffer zone of a reasonable width to protect the integrity of the area shall be included unless a distance is specified in the criteria. Natural screening may be considered in determining the width of the buffer zone.

Table 2.2-1. Avoidance Areas

Avoidance Areas	Present within site?	Section Addressed
a. Designated or registered national; historic districts; wildlife areas; wild, scenic, or recreational rivers; wildlife refuges; and grasslands.	Not Present	4.10
b. Designated or registered state: wild, scenic, or recreational rivers; game refuges; game management areas; management areas; forests; forest management lands; and grasslands.	Not Present	4.10
c. Historical resources which are not designated as exclusion or avoidance areas.	Not Present	4.9
d. Area which are geologically unstable.	Not Present	4.13
e. Within five hundred feet [152.4 meters] of a residence, school, or place of business. This criterion shall not apply to a water pipeline facility.	Not Present	4.3
f. Reservoirs and municipal water supplies.	Not Present	4.4
g. Water sources for organized rural water districts.	Not Present	4.4
h. Irrigated land. This criterion shall not apply to an underground transmission facility.	Not Present	4.11
i. Areas of recreational significance which are not designated as exclusion areas.	Not Present	4.10

2.3 Selection Criteria

Per NDAC Section 69-06-08-02-3, a site shall be designated (Table 2.3-1) only when it is demonstrated to the PSC by the applicant that any significant adverse effects resulting from the location, construction and maintenance of the facility, as they relate to the following, will be at an acceptable minimum or that those effects will be managed and maintained at an acceptable minimum. Figures 3 through 6 identify the selection criteria for PGS Phase II as well as other related resources.

Table 2.3-1. Selection Criteria

Selection Criteria	Potential Adverse Effects	Section Addressed
(1) Agricultural production.	None	4.3, 4.11
(2) Family farms and ranches.	None	4.11
(3) Land which the owner demonstrates has soil, topography, drainage, and an available water supply that cause the land to be economically suitable for irrigation.	None	4.11, 4.12
(4) Surface drainage patterns and ground water flow patterns.	None	4.12, 4.13
(5) Noise-sensitive land uses.	None	4.7
(6) The visual effect on the adjacent area.	None	4.8
(7) Extractive and storage resources.	None	4.11
(8) Wetlands, woodlands, and wooded areas.	None	4.3, 4.11, 4.15
(9) Radio and television reception, and other communication or electronic control facilities.	None	4.4
(10) Human health and safety.	None	4.5
(11) Animal health and safety.	None	4.17, 4.18
(12) Plant life.	None	4.15, 4.16

2.4 Policy Criteria

Per NDAC Section 69-06-08-02-4, the PSC may give preference to an applicant that will maximize benefits that result from the adoption of the following policies and practices, and in a proper case may require the adoption of such policies and practices (Table 2.4-1). The PSC may also give preference to an applicant that will maximize interstate benefits.

Table 2.4-1. Policy Criteria

Policy Criteria	Suitable Policy or Practice of Applicant	Section Addressed
a. Location and design.	Basin Electric's policy is to locate and design to minimize environmental impacts and utilize existing corridors.	1.0, 3.1
b. Training and utilization of available labor in this state for the general and specialized skills required.	Basin Electric will use local labor to the extent practicable.	4.2.2
c. Economies of construction and operation.	This project creates economies of construction and operation by constructing the facility in a location with existing infrastructure such as the highways, substation, and gas processing plant.	
d. Use of citizen coordinating committees.	The use of citizen coordinating committees is not expected for this project.	NA
e. A commitment of a portion of the transmitted product for use in this state.	Basin Electric has identified the need for additional electric transmission capacity in northwestern North Dakota as a result of increased demand. To meet reliability and system stability requirements for the region this facility is being built.	1.2
f. Labor relations.	No labor relations will be negatively affected by the project.	4.2.2
g. The coordination of facilities.	Basin Electric has coordinated with WBI for PGS Phase I gas delivery facilities from the gas pipeline lateral serving ONEOK's Stateline gas processing plant, and with MWEC for delivery of electricity generated at the MWEC's Stateline substation.	4.4.1.2
h. Monitoring of impacts.	Basin Electric and the construction contractor will employ Best Management Practices (BMPs) during construction to monitor ground disturbance impacts. Surface water impacts will be monitored according to the SWPPP and air impacts will be monitored according to the PSD and Permit to Construct.	4.6.2, 4.14.3
i. Utilization of existing and proposed rights of way and corridors.	Basin Electric has coordinated with WBI for PGS Phase I gas delivery facilities from the gas pipeline lateral serving ONEOK's Stateline gas processing plant, and with MWEC for delivery of electricity generated at the MWEC's Stateline substation.	4.2.2
j. Other existing or proposed transmission facilities.	Basin Electric is connecting to PGS Phase I with a 115-kV transmission line.	1.2

2.5 Design and Construction Limitations

Project construction and design would meet the requirements of the National Electrical Safety Code (NESC) for the Heavy Loading District and Basin Electric design criteria, and other applicable local or national building codes.

2.6 Economic Considerations

There are many economic considerations in the design and siting of a power generation facility and transmission line. Basin Electric has designed the PGS to take advantage of the proximity to existing energy supplies (natural gas from the ONEOK Stateline I gas processing plant) and MWEC's Stateline I substation for energy delivery in an area with existing roadways. In general, siting PGS Phase II on a previously disturbed industrial site (PGS Phase I) minimizes impacts to the surrounding community. Additionally, the close proximity to complementary facilities (energy acquisition and energy distribution) creates efficiency and condenses the development into a compact area.

3 Location, Proposed Facility Process Description and Restoration Procedures

3.1 Location

The proposed facility is located approximately 15 miles northwest of Williston, North Dakota in T155N, R103W, Section 20 in Williams County, North Dakota. Land use at the site area is zoned industrial. The land use around the site area is predominately agricultural. The Stateline I gas plant is located adjacent to the PGS in T155N, R103W, Section 21. There are also scattered oil and gas pads surrounding the PGS.

3.2 Facility Process Description

PGS Phase II will consist of two GE LM6000 natural gas fired simple-cycle CT electrical generator package. The LM6000 – PC SPRINT turbine output rating is a nominal 45 MW with an approximate heat rate of 9,600 Btu/Kw Hr HHV. These units utilize water injection along with a Selective Catalytic Reduction (SCR) system to achieve a high level of NOx Control. The units also incorporate COR to minimize CO emissions. Following the SCR, each unit's flue gas will be released to the atmosphere through individual 80 foot tall stacks. The purpose of the PGS is to provide additional power generation. A site layout diagram has been included in Appendix C.

The PGS facility includes an operator/maintenance building. This building contains the water treatment area for the demineralization trailers, service and demineralization water forwarding pumps along with the instrument air compressors. Also included in this building, is a maintenances/warehouse area and an operation control area. This facility is designed to be operated locally at the site or operated remotely from either Basin Electric's Culbertson Station located near Culbertson, Montana or Headquarters located in Bismarck, ND.

The CT generator package configuration will consist of GE LM6000 CT driving a common electrical generator. The LM6000 is a two-shaft aeroderivative gas turbine. A low pressure compressor and low pressure turbine are assembled on one shaft, forming the low pressure rotor. A high pressure compressor and high pressure turbine are assembled on the other shaft, forming the high pressure rotor. The low pressure turbine powers the output shaft and the electrical generator is driven using a flexible dry type coupling connected to the front end of the low pressure compressor shaft. A site layout diagram has been included in Appendix C.

Two transmission 115-kV single pole galvanized steel structures (Exhibit 1.2-1) will be required to deliver the power generated from PGS Phase II to the Stateline I Substation by extending the 115-kV system 650 feet to interconnect to PGS Phase I.

3.3 Restoration Procedures

During construction, crews would attempt to limit ground disturbance wherever possible. Temporary disturbance areas would be restored to their original condition to the extent practicable. Reclamation activities include removing and disposing debris, dismantling all temporary facilities (including staging and temporary material storage areas), leveling or filling tire ruts, and restoring the final grading plan of PGS. Erosion control measures will be implemented to minimize runoff during construction into the PGS stormwater

pond. (Figure 2). Erosion control measures such as silt fence, rock checks, flow diverters, mulching, seeding, or mesh fabric overlay would be installed when and where appropriate.

4 Environmental Analysis

4.1 Overview

This section provides a description of the environmental conditions that exist within the approximate 7-acre PGS site (Figure 1). The area in which PGS Phase II will be constructed has been previously disturbed to construct PGS Phase I. PGS Phase I was non-jurisdictional with regard to the ND PSC Siting Act because the generation capacity and the associated 115-kV transmission line of PGS Phase I are both below jurisdictional levels. Basin Electric obtained a conditional use permit for PGS from Williams County. The conditional use permit changed the zoning of 120 acres of land located in the SE 1/4 of Section 20, T155N, R103W from Agricultural to Industrial (Figure 1). A 650 foot extension of the 115-kV transmission line will be required to deliver the power generated from PGS Phase I and II to MWEC's Stateline I Substation (Figure 2). Construction of PGS Phase I began in June 2012, with commercial operation anticipated in April 2013; PGS Phase II Units will be constructed south of PGS Phase I's Unit 1 (Figure 2).

4.2 Demographics & Socioeconomics

4.2.1 Description of Resources

PGS Phase II is located within a lightly populated rural area in northwestern North Dakota. Population data for this section was taken from the 2010 U.S. Census; Per Capita Income and Poverty Level percentage was taken from the 2005-2009 American Community Survey 5-Year Estimates via the U.S. Census Bureau.

The population of Williams County is 22,398 (estimate for 2011 is 24,374¹). The county seat of Williams County is the city of Williston, which is the closest town to the proposed facility and has a population of 14,716². The project is located approximately 15 miles northwest of Williston, North Dakota in Hebron Township, T155N, R103W, Section 20, Williams County, North Dakota.

Table 4.2-1 summarizes the population and economic characteristics. The projected population of Williams County is expected to increase due to the burgeoning oil industry.

According to the 2010 U.S. Census, the largest industry employing residents of Williams County was agriculture, with oil and gas development being the second largest, and the third largest industry was construction.

Table 4.2-1. Population and Economic Characteristics

Location	Population	Per Capita Income* (2009 dollars)	Percentage of Population Below Poverty Level*
Williams County	22,398	27,293	10.2
Hebron Township (T155N, R103W)	34	Not available	Not available

*Denotes 2005-2009 American Community Survey 5-Year Estimates Data via U.S. Census Bureau. Hebron Township information was not available.

¹ <http://quickfacts.census.gov/qfd/states/38/38105.html>

²

http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC_10_PL_GCTPL2.ST13&prodType=table

4.2.2 Impacts

Because the area for PGS Phase II has already been cleared for the PGS Phase I, there are no temporary or permanent impacts anticipated. Additional land conversion will consist of the permanent loss (0.002 acres) due to the two 8-ft diameter foundations for the 115-kV power pole structures (Figure 1).

The construction of the PGS Phase II will provide temporary income to construction workers. Peak construction labor force for PGS Phase II will be approximately 75 employees. Two permanent employees are anticipated to staff the PGS. Additional personal income will be generated by circulation and recirculation of dollars paid out by Basin Electric as business expenditures and state and local taxes. PGS Phase II would provide an estimated annual value to property taxes of \$124,000. Expenditures made for equipment, energy, fuel, operating supplies, and other products and services benefit businesses in the counties and the state. The PGS Phase II will not cause additional impacts to industries near the site and will support the continued reliability of the electrical system for the oil and gas development in the region. Basin Electric will use local labor to the extent practicable and no labor relations will be negatively affected by the Project.

4.2.3 Mitigation

Socioeconomic impacts associated with the PGS Phase II will be primarily positive, with an influx of wages and expenditures made at local businesses during PGS Phase II construction. As a result, no mitigation is proposed.

4.3 Land Use

4.3.1 Description of Resources

The PGS is located approximately 15 miles northwest of Williston, North Dakota in Hebron Township (T155N, R103W, Section 20), Williams County, North Dakota. The current land use is industrial with the surrounding area consisting of rural agricultural land used for crops and grazing cattle. Other surrounding land use includes industrial growth resulting from the rapidly developing oil and gas industry. Oil and gas wells and associated energy development infrastructure have become common, and are located throughout the area. Current zoning is a mix of agricultural, industrial, residential, and commercial (Williams County 1987). The PGS is not within Williston city limits or within an area of military installation. The development of the proposed generation station will not displace any residences or existing or planned industrial facilities.

Based on a review of aerial photographs and land use database information it was determined that the area was cropland prior to the conversion of land to industrial use for PGS Phase I (Figure 3). Table 4.3-1 identifies current land cover in the PGS.

Table 4.3-1. Land Cover

Major Habitats and Their Relative Abundance	PGS Units 2 and 3		Transmission Line and Poles	
	Acreage	Percent of Site	Acreage	Percent of Site
Riparian	0	0	0	0
Developed	7	100	0	0
Roads	0	0	0	0
Grassland	0	0	0	0
Cropland	0	0	0.002	100
Wetland *	0	0	0	0
Total	7	100	0.002	100

* Wetland acreage for this section was calculated based on available general land cover data, and may vary from acreage calculated from specific wetland data presented in Section 4.14.

Basin Electric was required to apply for a conditional use permit to change the zoning from agricultural to industrial use with Williams County North Dakota. A Conditional Use Application was submitted to Williams County on January 23, 2012 requesting the zoning change. The permit application included. Williams County approved the conditional use for a 120 acre site in T155N, R103W Section 20 in Williams County North Dakota. PGS Phase I is currently being constructed on approximately 7 acres within the 120 acres. (Figure 1).

4.3.2 Impacts

Land use at the PGS is zoned industrial. Lands owned by Basin Electric that are not required to support PGS, will continue to be used for agricultural purposes. The additional land cover impacts anticipated due to PGS Phase II is minimal. PGS Phase II will be constructed south of Unit 1 within the PGS site (Figure 2) with the exception of the 650foot 115-kV transmission line. There transmission extension requires two single pole galvanized steel structures. This will result in a permanent land use loss of 0.002 acres of cropland from the placement of the structure foundations.

4.3.3 Mitigation

Since the site has already been disrupted for the PGS Phase I, no mitigation efforts are necessary.

4.4 Public Services

4.4.1 Description of Resources

4.4.1.1 Local Services – General Discussion

The PGS is located in a lightly populated, rural area in northwestern North Dakota. There is an established transportation and utility network that provides access and necessary services to the light industry, homesteads, and farms existing in and near the PGS. Williams County provides emergency and social services and manages several county parks. The closest town to the PGS is Williston, located approximately 15 miles southeast. The city provides recreation and parks, a community center, a golf course, community pool, and a community library. Additionally, the city's local services include emergency services, a fire department, ambulance service, and a police department. There are also local retail service facilities and institutions.

4.4.1.2 Electrical Service

Williams County is located within the MWEC and Montana-Dakota Utilities Co. service area. MWEC is a not-for-profit, member-owned electric distribution cooperative, and Montana-Dakota Utilities Company is a division of MDU Resources Group, Inc. Both provide electrical services to residential and commercial customers in the surrounding area in North Dakota. Basin Electric and Western, through the operation of the Integrated System (IS) transmission system, also deliver electrical supply to the area.

Natural gas is supplied to PGS by WBI Energy Transmission, Inc.'s 1800 foot long, 8 inch diameter pipeline that originates near ONEOK's Stateline I Gas Processing Plant gas interconnection from the Northern Border Pipeline.

4.4.1.3 Roads

County and township (section line) roads characterize the existing roadway infrastructure in and around the PGS. The PGS is located northwest of the intersection of 56th St. NW and County Highway 5 (151st Ave NW), where the PGS Phase I is under construction.

4.4.1.4 Traffic

The existing traffic volumes on the area's county highways are documented in Table 4.4-1. . Determining the specific capacity of any highway is a complex process; however, general estimates are used for planning purposes. For purposes of comparison, the functional capacity of a two-lane paved rural highway is approximately 5,000 vehicles per day, or Average Daily Traffic (ADT). In general, the state highways in and near the PGS carry higher levels of traffic than what is average for rural North Dakota, but represent only a fraction of the capacity of the roadway.

Table 4.4-1. Existing Daily Traffic Levels

Roadway Segment	2010 Average Annual Daily Traffic (AADT)	2010 Commercial Truck Traffic
U.S. Highway 2 east of Williston	1700	235

Source: 2010 Traffic Volumes from NDDOT, Bismarck

Additional county and township roads are near the PGS, but have no count data available. In general, the North Dakota Department of Transportation (NDDOT) provides traffic counts for designated U.S. and State Highways (NDDOT 2011). As per NDDOT, the routes with no counts are likely lower than those with

count data. The nearest highway, US 2, is located 6 ½ miles south of the PGS. State highways nearest the PGS are located in the Williston area (15 miles to the southeast.)

4.4.1.5 Water Supply

Hebron Township and the surrounding area has limited public infrastructure services, which is typical of most rural townships in western North Dakota. Homes typically utilize septic systems and water wells for their household needs. The PGS will have water supplied by the Williams Rural Water District which has lines located in this area.

4.4.1.6 Telephone, Fiber Optic, Television and Radio Communications

The PGS will make use of existing underground fiber cable which is located on the west side of 151st Avenue. PGS is interconnected with Basin Electric facilities thru Basin Electric's microwave communication system

No radio or television signal interference directly from the transmission of electricity is anticipated because of the differences in frequency of the signals.

4.4.2 Impacts

4.4.2.1 Local Services

No negative impacts to local services are anticipated.

4.4.2.2 Electrical Service

Basin Electric has identified the need for additional electric generation in northwestern North Dakota as a result of increased demand and to meet reliability and system stability requirements for the region. Investigations and analyses conducted for the overall power delivery systems found that without improvements, the flow of power along existing lines may result in local line overloads, especially in the vicinity of Williston, North Dakota.

Energy will be generated and distributed to the electrical grid system serving the rapidly increasing electrical load requirements in northwestern North Dakota. PGS Phase II will improve the reliability of service into the area. A 650 foot extension of PGS Phase I's 115-kV transmission line will be required to deliver the power generated from PGS Phase II to MWEC's Stateline I Substation. (Figure 2).

4.4.2.3 Roads

The access road from 151st Avenue NW to the site will be 24-feet wide. No major grading or filling is anticipated.

4.4.2.4 Traffic

The peak construction labor force for PGS Phase II is will be approximately 75 employees. Two permanent employees are anticipated to staff PGS. This workforce and support services will generate an approximate maximum of 100 additional vehicle trips per day. The equipment and material deliveries will be approximately 260 truckloads. Using any combination of federal, state, and county highways and other township roads throughout the Project area, the traffic impacts are considered negligible. The traffic volume in and around Williston has increased significantly with the oil and gas development occurring in the area. Additional vehicles in the area as a result of the PGS would be temporary in nature. The capacity of any route and Level-of-Service to the traveling public would not be impacted.

Truck access to the PGS is served by Williams County Road 5 and US Highway 2. Additional operating permits will be issued by the state, county, and/or township for over-sized truck movements.

4.4.2.5 Water Supply

Water requirements range from 25 gpm/unit in the winter to 50 gpm/unit in the summer when in operation. Potable water will be supplied to the plant site from the local rural water distribution system and placed into the existing 120,000 gallon service tank. The potable water is further treated thru the utilization of a portable demineralization trailer and transferred into the 220,000 gallons demineralization water storage tank. When required the demineralization trailer is regenerated offsite. Any excess process water will be evaporated on-site or if required, hauled off site to a licensed waste facility.

4.4.2.6 Telephone, Fiber Optic, Television and Radio Communications

No impacts to these communication resources are anticipated.

4.4.3 Mitigation

Construction and operation of PGS Phase II will be in accordance with all associated Federal, state and local permits and laws, as well as industry construction and operation standards. Due to the minor impacts expected on the existing infrastructure during project construction and operation, no mitigation is proposed.

4.4.3.1 Local Services

Construction, operation, and maintenance of PGS Phase II will not impact local services, and no mitigation is proposed.

4.4.3.2 Electrical Service

The construction of PGS Phase II will not negatively impact existing electrical service so no mitigation is proposed.

4.4.3.3 Roads

Construction, operation, and maintenance of PGS Phase II will not negatively impact existing roadways, so no mitigation is proposed.

4.4.3.4 Traffic

Construction, operation, and maintenance of PGS Phase II will not negatively impact traffic, so no mitigation is proposed.

4.4.3.5 Water Supply

Construction, operation, and maintenance of PGS Phase II will not negatively impact local water supply, so no mitigation is proposed.

4.4.3.6 Telephone, Fiber Optic, Television and Radio Communications

Construction, operation, and maintenance of PGS Phase II will not negatively impact telephone, fiber optic, television and radio communications so no mitigation is proposed.

4.5 Human Health and Safety

4.5.1 Description of Resources

4.5.1.1 Human Health

EMF, as it relates to transmission lines, references two separate fields: electric fields and magnetic fields. Electric fields are produced by the line voltage, and magnetic fields are produced by the electric current in the lines. An electric field results from the voltage on an electrical wire as caused by electric charges, and electric

fields can exert forces on other nearby charges. The intensity of the electric field is related to the voltage of the line and proximity to the conductor. Electric fields are measured in volts per meter (V/m) or kilovolts per meter (kV/m) where 1 kV = 1,000 V.

The National Institute of Environmental Health Sciences and the National Institutes of Health prepared a Questions and Answers paper on Electric and Magnetic Fields Associated with the Use of Electric Power in 2002 (included in Appendix A). The document indicates that for a 115-kV transmission line the typical electric field at 50 feet from the centerline is 0.5 kV/m and 6.5mG. Both values are far less than the International Commission on Non-Ionizing Radiation protection (2010) levels for members of the general public of 4.2 kV/m for electric fields and 833 mG for magnetic fields.

4.5.1.2 Human Safety

Proper safeguards will be implemented during construction and operation of the facility. The transmission line and associated facilities will be designed to meet local, state, National Electric Safety Code (NESC), and Basin Electric safety standards. Construction crews will comply with local, state, NESC, and Basin Electric standards regarding the installation of facilities.

The proposed transmission line will be equipped with protective devices such as relays at the substation to safeguard the public from the transmission line if an accident occurs or if a structure or conductor falls to the ground.

4.5.2 Impacts

4.5.2.1 Human Health

EMF will be strongest directly under the transmission line and decrease with increasing distance from the transmission line towards the ROW edge.

Based on the National Institute of Environmental Health Sciences and the National Institutes of Health paper on Electric and Magnetic Fields Associated with the Use of Electric Power in 2002 the EMF levels at the edge of the right of way for the 115-kV transmission segment under maximum operating conditions and normal operating conditions are below the published guidelines from the ICNIRP Guidelines. The nearest sensitive receptor from the PGS is greater than 1 mile (Figure 4). EMF from the transmission line is predicted to be significantly within the protection standards for protection of the general public. No impacts are anticipated.

4.5.2.2 Human Safety

No impacts are anticipated.

4.5.3 Mitigation

4.5.3.1 Human Health

No EMF-related impacts to humans or animals are anticipated, no additional mitigation is required.

4.5.3.2 Human Safety

If the proper safeguards and protective measures are implemented as described above, no additional mitigation is required.

4.6 Air

4.6.1 Description of Resources

Air quality generally is determined by comparing monitored pollutant concentrations with prescribed standards. The maximum level of a pollutant considered to be acceptable is specified by the Environmental Protection Agency (EPA). The Clean Air Act (CAA) established two types of National Ambient Air Quality Standards (NAAQS). The EPA has established NAAQS for six criteria air pollutants: sulfur dioxide (SO₂), carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), respirable particulate matter (PM₁₀ and PM_{2.5}), and lead (Pb). Primary standards set limits to protect human health, and secondary standards set limits to protect public welfare. For most criteria pollutants, the North Dakota Ambient Air Quality Standards (NDAAQS) are the same as the federal NAAQS; however, the North Dakota Department of Health (NDDH) has set more stringent standards for SO₂.

The PGS is located in Williams County, North Dakota. Williams County is currently not part of a designated Air Quality Control Region (AQCR). AQCR's were established by the EPA and local agencies in accordance with Section 107 of the CAA as a means to implement the CAA and comply with the NAAQS through state implementation plans. Additional AQCR's may be designated by the EPA as necessary to protect the public health and welfare. Williams County is currently classified as attainment or unclassifiable (to be treated as attainment) for all NAAQS criteria pollutants.

Emissions from all phases of construction and operation of the PGS would be subject to applicable state and federal air regulations. Most air quality regulatory programs address emissions from stationary sources of air pollution; these programs would primarily affect ongoing operations of the PGS. Air quality regulations affecting construction are primarily concerned with reducing emissions associated with construction equipment and fugitive dust.

The new stationary air emission sources associated with PGS Phase II would include two simple-cycle natural gas-fired combustion turbines (CTs). The CTs would be General Electric (GE) aero derivative LM6000 PC Sprint models, each with a nominal output rating of 45 megawatts (MW) and an approximate heat rate of 9,600 Btu/kW-hr, based on the higher heating value (HHV). The CTs would be identified as PGS Unit 2 and PGS Unit 3 (Figure 2). Both units would be natural gas-fired and equipped with water injection and selective catalytic reduction (SCR) to control NO_x emissions, as well as an oxidation catalyst system to control CO emissions. Each unit will be equipped with a 80-foot independent exhaust stack to release flue gas to the atmosphere after passing through the associated air pollution control devices.

PGS Phase I currently consists of an identical CT as being proposed for PGS Phase II. PGS Phase I commenced construction in June of 2012. PGS Phase II is proposed to be added to the PGS Phase I to provide electrical generation capacity. The total nominal generation capacity of the PGS would be 135 MW after implementation of the PGS Phase II.

PGS Phase II air emission sources would be regulated at the federal level by the CAA, as amended, and at the state level by North Dakota Administrative Rules. Regulations that are potentially applicable to the project include:

- North Dakota Construction and Operating Permit Rules;
- Title V Operating Permits;

- Prevention of Significant Deterioration (PSD) Review; and
- New Source Performance Standards.

North Dakota air permitting requirements are codified in Article 33-15, Air Pollution Control. Chapter 33-15-14, Designated Air Contaminate Sources, Permit to Construct, Minor Source Permit to Operate, Title V Permit to Operate, establishes permit review procedures for all facilities that can emit pollutants to the ambient air. New facilities are required to obtain a Permit to Construct prior to initiating construction activities. Basin Electric has submitted and received a Permit to Construct from the NDDH for PGS Phase I. An application will be submitted for the construction of PGS Phase II in the fourth quarter 2012.

In addition to Chapter 33-15-14 requirements, North Dakota Rules Chapter 33-15-15 establishes Prevention of Significant Deterioration (PSD) of air quality requirements. The provisions of 40 CFR 52.21, paragraphs (a)(2) through (e), (h) through (r), (v), (w), (aa), and (bb) as they existed on July 2, 2010, are incorporated by reference into Chapter 33-15-15. This includes revisions to the federal rules that were published as a final rule in the Federal Register by July 2, 2010 but had not yet been published in the Code of Federal Regulations.

New Source Performance Standard (NSPS) regulations (40 CFR 60) establish pollutant emission limits and monitoring, reporting and recordkeeping requirements for various emission sources based on source type and size. The NSPS applies to new, modified or reconstructed sources. Subpart GG of 40 CFR 60, *Standards of Performance for Stationary Gas Turbines*, applies to stationary gas turbines with a heat input at peak load equal to or greater than 10 million British thermal units per hour (MMBtu/hr) that commenced construction after October 3, 1977. In addition to Subpart GG, Subpart KKKK, *Standards of Performance for Stationary Combustion Turbines*, applies to stationary combustion turbines that commenced construction after February 18, 2005.

The PGS Phase II will be required to comply with all applicable state and federal air quality regulations and fulfill applicable permit review procedures prior to commencing construction.

4.6.2 Impacts

Construction of PGS Phase II would potentially have temporary adverse impacts on air quality due to fugitive dust emissions during ground-disturbing activities associated with construction and installation of the equipment and associated infrastructure of PGS Phase II. Construction emissions would result from combustion of fuel in construction equipment/vehicles, fugitive dust associated with site preparation/grading and travel on the access road. Construction of Units 2 and 3 at the PGS site is scheduled to begin in June of 2013 or sooner should all necessary permits be acquired and would occur over approximately 1 year.

Because of their temporary nature, construction emissions will not have a long-term impact on ambient air quality, and PGS Phase II's implementation of the proposed emission control measures as well as other measures specified by the NDDH are anticipated to reduce impacts associated with construction emissions to less than significant levels.

Operation of PGS Phase II would result in air emissions from stationary fuel burning equipment. There are two simple-cycle natural gas-fired combustion turbines proposed for the Project. PGS Phase II would operate as allowed under applicable air permits obtained prior to construction and operation. Operation of PGS Phase II in compliance with the applicable permit limits is anticipated to result in impacts that are protective of the environment and would not result in an adverse impact to public health and welfare.

Based on the combustion characteristics of simple-cycle natural gas-fired combustion turbines utilizing water injection, SCR and oxidation catalysts to control pollutant emissions, it is anticipated that compliance with all NAAQS and NDAAQS would be maintained. Compliance demonstrations will be required as applicable under the construction permit review and approval process.

4.6.3 Mitigation

During construction it is proposed that standard dust control measures be employed to reduce generation of fugitive dust due to surface disturbance. Dust control measures may include, but are not limited to the following:

- Applications of water during grading;
- Paving, chemical stabilization, or watering of internal roadways after completion of grading;
- Reduction of speed on unpaved roadways to 15 miles per hour or less;
- Use of sweepers or water trucks to remove "track-out" at any point of public street access; and,
- Stabilization of dirt storage piles by chemical binders, tarps, fencing, or other erosion control.

Construction of PGS Phase II would also result in tailpipe emissions from a variety of sources, including cranes, loaders, excavators, graders, generators, vibratory rollers, concrete emplacement trucks, and crew trucks. It is proposed that the following measures be employed to reduce emissions from vehicles and construction equipment during project construction:

- Properly maintain construction equipment in accordance with manufacturers' specifications or standard practices; and,
- Limit truck idling to the extent practicable.

The simple-cycle natural gas-fired combustion turbines associated with PGS Phase II will be equipped with water injection and SCR, to achieve a high level of NO_x control. Additionally, COR will be used to reduce CO emissions. Use of these control systems along with the primary fuel of natural gas and operating limits imposed by required air emissions operating permits are anticipated to mitigate impacts to the ambient air quality and ensure compliance with applicable State and National Ambient Air Quality Standards (NAAQS).

4.7 Noise

4.7.1 Acoustic background and terminology

The term "sound level" is often used to describe two different sound characteristics called sound power and sound pressure. Every source that produces sound has a sound power level (L_w). The sound power level is the acoustical energy emitted by a sound source and is an absolute number that is not affected by the environment. The acoustical energy produced by a source propagates through a media as pressure fluctuations. These pressure fluctuations, also called sound pressure (L_p), are what human ears hear and microphones measure.

Sound energy is physically characterized by amplitude and frequency. Sound amplitude is measured in decibels (dB) as the logarithmic ratio of a sound pressure to a reference sound pressure (20 microPascals). The reference sound pressure corresponds to the typical threshold of human hearing. A three dB change in a continuous broadband sound is generally considered "just barely perceptible" to the average listener. A five

dB change is generally considered “clearly noticeable” and a 10 dB change is generally considered a doubling (or halving) of the apparent loudness.

Frequency is measured in hertz (Hz), which is the number of cycles per second. The typical human ear can hear frequencies ranging from approximately 20 to 20,000 Hz. Normally, the human ear is most sensitive to sounds in the middle frequencies (1,000 to 8,000 Hz) and is less sensitive to sounds in the low and high frequencies. As such, the A-weighting scale was developed to simulate the frequency response of the human ear to sounds at typical environmental levels. The A-weighting scale emphasizes sounds in the middle frequencies and de-emphasizes sounds in the low and high frequencies. Any sound level to which the A-weighting scale has been applied is expressed in A-weighted decibels or dBA. For reference, the A-weighted sound pressure level and subjective loudness associated with some common sound sources are listed in Table 4.7-1.

Sound in the environment is constantly fluctuating; examples could be when a car drives by, a dog barks, or an aircraft passes overhead. Therefore, sound metrics have been developed to quantify fluctuating environmental sound levels. These metrics include the exceedance sound levels. The exceedance sound level, L_x , is the sound level exceeded “x” percent of the sampling period and is referred to as a statistical sound level. The most common L_x value is L_{eq} . L_{eq} is the average sound level for a given time period. Another common sound metric is L_{dn} . L_{dn} is a 24-hour average sound level that is often used to represent community sound levels. A 10-dB nighttime penalty is added to the nighttime hours to account for added sensitivity to noise during the night. L_{eq} and L_{dn} are presented in this analysis

Table 4.7-1. Sound Pressure Level, Subject Evaluation and Environment

Sound Pressure Level (dBA)	Subjective Evaluation	Environment	
		Outdoor	Indoor
140	Deafening	Jet aircraft at 75 ft.	
130	Threshold of pain	Jet aircraft during takeoff at a distance of 300 ft.	
120	Threshold of feeling	Elevated train	Hard rock band
110		Jet flyover at 1,000 ft.	Inside propeller plane
100	Very loud	Power mower, motorcycle at 25 ft., auto horn at 10 ft., crowd sound at football game	
90		Propeller plane flyover at 1,000 ft., noisy urban street	Full symphony or band, food blender, noisy factory
80	Moderately loud	Diesel truck (40 mph) at 50 ft.	Inside auto at high speed, garbage disposal, dishwasher
70	Loud	B-757 cabin during flight	Close conversation, vacuum cleaner
60	Moderate	Air-conditioner condenser at 15 ft., near highway traffic	General office
50	Quiet		Private office
40		Farm field with light breeze, birdcalls	Soft stereo music in residence
30	Very quiet	Quiet residential neighborhood	Inside average residence (without TV and stereo)
20		Rustling leaves	Quiet theater, whisper
10	Just audible		Human breathing
0	Threshold of hearing		

Source: Adapted from Architectural Acoustics, M. David Egan, 1988 and Architectural Graphic Standards, Ramsey and Sleeper, 1994.

Burns & McDonnell analyzed the sound levels of the proposed PGS using a predictive, 3-dimensional noise model (CadnaA) based on the methodologies presented in the ISO-9613 standards. The model analyzed the sound levels expected at the nearest residences to the PGS for two scenarios: 1) one combustion turbine Unit, and 2) three combustion turbine Units. Additionally, the model analyzed sound levels over a gridded area to produce sound contours that covered the area that could possibly be impacted from the sound levels of the PGS.

4.7.2 Description of Resources

The study area for noise included receptors nearest to the PGS (Figure 5). The PGS resides in a very rural location with nearby traffic noise sources, and industry noise sources across County Road 5, at the ONEOK Stateline I gas processing facility.

The closest residences are located to the east and north, but there are residences to the south and southwest of the facility as well. Additionally, there is an existing natural gas processing plant located directly adjacent to the PGS. The gas facility consists of equipment typical to those types of facilities: engines, compressors, etc. Figure 4 shows the facility location and the location of the closest identified noise sensitive receptors. The figure indicates the nature of each sensitive noise receptor: residences, farm storage areas, and a church.

Burns & McDonnell analyzed the expected noise impacts from the proposed Pioneer Generation Station (PGS), to be located near Williston, North Dakota for Basin Electric Power Cooperative (Basin Electric). Basin Electric's PGS Phase I, consisted of the installation of one 45-MW, simple cycle combustion turbine (GE LM6000) with associated equipment (collectively referred to as "Unit"). PGS Phase II is the addition of similar Units, for a maximum total of 135 MW (3 combustion turbine Units) at the site. Basin Electric requested that the noise analysis be performed on a single Unit as well as a three-Unit facility as a conservative evaluation approach.

4.7.3 Impacts

4.7.3.1 Facility Noise

Burns & McDonnell analyzed the sound levels of the proposed PGS using a predictive, 3-dimensional noise model (CadnaA) based on the methodologies presented in the ISO-9613 standards. The model analyzed the sound levels expected at the nearest residences to the PGS for two scenarios: 1) one combustion turbine Unit, and 2) three combustion turbine Units. Additionally, the model analyzed sound levels over a gridded area to produce sound contours that covered the area that could possibly be impacted from the sound levels of the PGS.

There are no applicable noise regulations for the project. However, EPA has created guidelines noise levels to which facilities such as this can be compared. While they are not federally enforceable noise limits, they can provide valid criteria for which to evaluate the effects of project-generated noise on public health. This analysis compared the project-generated sound levels to the EPA guidelines and it was determined that there are not expected to be any exceedances of the EPA guidelines with the PGS as proposed. Additionally, there is a large, existing natural gas processing plant located directly adjacent to the PGS. This gas facility has no operational noise limits and contains equipment typical of these types of facilities: engines, compressors, etc. Based on past experience with these types of gas facilities, it is anticipated that the PGS will operate at or below the sound levels produced by the gas processing facility.

Initially, the maximum L_{eq} sound level at any sensitive noise receptor is expected to be 42.0 dBA with only one Unit operating. This equates to an L_{dn} sound level of 48.4 dBA, noticeably lower than the EPA guideline of 55 dBA. In addition to this being considered a quiet sound level at the exterior of a residence, standard housing construction will reduce outside noise levels by 10 to 20 dB inside of a house. Further, this location is used for farm storage and is unlikely to be disturbed by noise at night. In fact, the top three affected receptors are all non-residential. Therefore, noise levels due to operation of one Unit are expected to have little or no impact on the closest residences.

If three Units are placed into operation, the maximum L_{eq} sound level at a sensitive noise receptor could reasonably be expected to approach 44.1 dBA. This equates to an L_{dn} sound level of 50.5 dBA, which is lower than the EPA guideline of 55 dBA by a noticeable amount. This would still be considered a quiet sound level at the exterior of a residence, and standard housing construction will reduce outside noise levels by 10 to 20 dB inside of a house. Similarly to one Unit, the top three affected receptors are non-residential and are unlikely to be disturbed by noise at night. Therefore, noise levels due to the operation of three Units are expected to have little or no impact on the closest residences.

Detailed information about the noise study and associated tables and maps are in Appendix A.

4.7.3.2 Construction Noise

The project has the potential to elevate local noise levels due to traffic, construction of transmission lines and the electrical generation units. However, these noise levels are deemed to be relatively short and temporary in their nature over the life of the project and cannot therefore be considered a noise impact.

4.7.4 Mitigation

The modeled operational noise levels at the sensitive noise receptors varied slightly, but all of the sound levels were below the EPA's recommended noise guidelines. Therefore, noise levels due to the operation of one or three Units are expected to have little impact on the closest sensitive noise receptors. Additionally, the adjacent natural gas processing facility contains noise-producing equipment, but the facility has no operational noise limits. Based on past experience with these types of facilities, it is anticipated that the PGS will operate at or below the sound levels produced by the gas processing facility. With no impacts expected, no mitigation is proposed.

4.8 Visual Impacts

4.8.1 Description of Resources

The topography in and surrounding the PGS is mostly flat with some rolling hills. Elevation of the PGS is approximately 2,380 feet above sea level. A topographic map of the PGS is shown in Figure 3. The landscape is characterized by crop fields. The area surrounding the PGS is used for crop production.

Existing electric infrastructure, such as transmission lines, distribution lines and substations, as well as oil and gas facilities are scattered throughout the surrounding landscape. The ONEOK Stateline I gas processing facility is located east of the PGS on the north side of 56th St. NW and adjacent to the recently constructed MWEC's Stateline I Substation. The settlements in the area are residences and farm buildings (inhabited and uninhabited) along the county and township roads. These structures are focal points in the dominant open space character of the vicinity. Typically, the farmsteads and residences are located at lower elevations and/or are surrounded by wind-breaks (often on the northern and/or western sides) to avoid the prevailing winds common to the area. Roads generally follow section lines. There are occupied residences one and one-half mile north of the PGS, one approximately one and one-half mile southwest, and another occupied farmstead one and one-half - miles east.

4.8.2 Impacts

Construction has already begun on PGS Phase I and evidence of the building process is currently visible. The addition of PGS Phase II will be visible on the generation station site to landowners and community residents

who live near the station. There will be two 80-foot stacks built as part of Phase II. Two additional 115-kV single pole galvanized steel structures will be required for the 650 foot 115-kV transmission line that will deliver the power generated from PGS Phase II to the Stateline I Substation. (Figure 2).

4.8.3 Mitigation

Although the PGS Phase II will contrast with the historical surrounding land use, these areas have recently been impacted visually by the existing 41.6-kV distribution infrastructure along County Road 5, the newly constructed 115-kV, transmission infrastructure that connects to the recently built Stateline I Substation and the ONEOK Stateline I gas processing facility across 151st Street NW/County Road 5. There are also at least four oil/gas facilities recently constructed within one-mile of the PGS. No mitigation is required.

4.9 Cultural Resources

4.9.1 Description of Resources

Metcalf Archaeological Consultants, Inc. (Metcalf) completed a Class I Literature Search at the North Dakota State Historic Preservation Office (SHPO) and completed a Class III Cultural Resource Inventory of the project area at the request of Basin Electric. The Class I Literature Search was completed on November 30, 2012. The project area received a Class III Cultural Resource Inventory on January 29, 2012.

The data gathering area established for the Class I Literature Search was defined as the project area plus a one-mile buffer. This background records search identified three previous cultural resource investigations and six previously known sites within the data gathering area at the time the search was completed. The sites identified are represented by two prehistoric sites, two prehistoric site leads, one historic site, and one architectural site.

HDR was retained by Basin Electric to complete an application to the North Dakota Public Service Commission. During a previous project HDR reviewed SHPO and GLO records that partially overlapped with the Basin Electric project area. This HDR records search was completed in June 2011. Within the overlapping portions of the project areas the data gathered was congruent, except that since completion of the Metcalf Class III Inventory, HDR completed its own project in the area and as such one additional inventory report can be added to the report file search results. In addition, GLO records, that HDR reviewed, did not identify any possible historic features or resources. Table 4.9-1 summarizes the previously identified sites within the data gathering area. Table 4.9-2 Previously Identified Investigations Within the Data Gathering Area.

Table 4.9-1. Previously Identified Archaeological Sites and Leads Within the Data Gathering Area

County	Site Number	Site Type	Location			NRHP Status
			T	R	S	
Williams	32WIX153	Lithic scatter	Confidential			Not evaluated
Williams	32WIX154	Lithic scatter				Not evaluated
Williams	32WIX155	Lithic scatter				Not evaluated
Williams	32WI181	Two stone circle				Not evaluated
Williams	32WIX368	Rock alignment				Not evaluated
Williams	32WI1203	Pioneer School, schoolhouse				Not evaluated

Table 4.9-2. Previously Identified Investigations Within the Data Gathering Area

Manuscript number	Author	Date	Title
2247	Sheldon, C.	1981	A Class III Intensive Inventory of the Proposed Snake Pipeline, Roosevelt County, Montana, and Williams County, North Dakota
4557	Metcalf, M., A. McKibbin, J. Medsker, K. Schweigert, and M. McFaul	1988	A Class II Cultural Resource Survey of Five Coal Study Areas, Williams Divide, Hettinger, Slope, Bowman, Grant, and Adams Counties, Western North Dakota
11978	Lechert, S. and J. Schleicher	2011	A Class I and Class III Cultural Resource Inventory of the State Line Gas Plant, Williams County, North Dakota
-	Sabatke, S., D. Eigenberger, M. Mueller, and K. Palmer	2011	Class III Cultural Resources Inventory for the Williston to Stateline I Transmission Line Project, Williams County, North Dakota

Basin Electric completed its review of records at the SHPO and its Class III inventory of the project area prior to construction activities. The cultural resource work was completed prior to state regulatory requirements. Subsequent to completion of the report, project facilities changed to the extent that the project now falls under state regulatory review. However, the cultural resource work completed for this project appears to be satisfactory in regards to North Dakota Century Code Chapter 49-22, the Energy Conversion and Transmission Line Siting Act., which simply states that scenic areas, historic sites and structures, and paleontological or archaeological sites should be considered as a part of the state application process. Metcalf personnel used for this investigation are professional archeologist permitted by the state of North Dakota per NDCC 55-03-01.

Metcalf created a report detailing their findings of the Class III cultural resource inventory and supplied this report to SHPO on behalf of Basin Electric in February 2012. The Metcalf report, entitled: "Basin Electric Power Cooperative's Pioneer Station: A Class III Cultural Resource Inventory in Williams County, North Dakota" can be found on file at SHPO if review of the record is desired. The report stated that no new cultural resources were identified during inventory. SHPO responded to Basin Electric in February 2012

finding the report acceptable and concurring with Metcalf's determination of "No Historic Properties Affected" provided the project remains as described and mapped.

4.9.2 Impacts

Basin Electric does not anticipate adverse impacts to archaeological or architectural resources as a result of pre-construction, construction, operation or maintenance of the facility as no resources were found within the project boundary to warrant such consideration. All resources identified outside of the project boundary were likely not affected or will likely not be affected by project pre-construction, construction, operation, or maintenance because the qualities that may make these resource significant will not be diminished.

4.9.3 Mitigation

Basin Electric should not need to mitigate for any archaeological or architectural resources for the project as none were identified within the project boundary during inventory nor were unanticipated archeological features discovered during the ground disturbance activity for PGS Phase I.

4.10 Recreational Resources

4.10.1 Description of Resources

Recreational opportunities in Williams County include camping, hiking, biking, swimming, golfing, hunting, fishing and nature observation. Review of state and federal databases indicates that no registered national wildlife refuges, state wildlife management areas, state game refuges, game management areas, nature preserves, or county parks are present within the PGS area. ND State Land Department managed parcels are located 2.5 miles southwest of the PGS and also 3.5 miles to the southeast. ND State Land Department land is open to walk-in hunting unless otherwise posted.

4.10.2 Impacts

In general, recreational impacts will be visual in nature and limited to individuals using public or private property in the area for hiking, hunting, fishing, or nature observation. See Section 4.8 for detailed discussion of anticipated visual impacts and proposed mitigative measures. No adverse effects to recreational resources are anticipated.

4.10.3 Mitigation

Recreational resources will not be impacted by PGS Phase II so no mitigation is proposed.

4.11 Effects on Land Based Economies

4.11.1 Description of Resources

4.11.1.1 Agriculture/Farming

Williams County contains 857 farms of which the primary commodity is crops, primarily wheat. Cattle are the primary livestock in the county. According to the 2007 Census of Agriculture, the amount of land in farms decreased 3 percent from 2002. The market value of production in 2007 was approximately \$127,333,000. Crop sales account for approximately 91 percent of the total value.

Crops are a large percentage of the value and the land type, such as prime farmland, is important in production. Prime farmland is the land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. The National Resource Conservation Service (NRCS) has two classifications for prime farmland. The first is where all areas of the soil series are classified prime farmland. The second is where only the drained areas of the soil series are prime farmland. The NRCS also identifies farmland of statewide and local importance, which is land that is important for the production of food, feed, fiber, forage, and oilseed crops. Generally, additional farmlands of statewide or local importance include those that are nearly prime and that produce high yields of crops in an economic manner when treated and managed according to acceptable farming methods. Some may produce as high a yield as prime farmland soils if conditions are favorable (Figure 5).

The North Dakota State Water Commission's database reveals no irrigation permits were issued within the vicinity of the PGS. It is unlikely the PGS will adversely impact any irrigation permits since it is located adjacent to roads, other industrial land uses, and will be less than 8 acres and will therefore not affect mechanical irrigation.

Table 4.11-1. Prime Farmland

Corridor Soil Units	All Areas Are Prime Farmland	Soil of Statewide/ Local Importance	Prime Farmland Only When Drained	Prime Farmland if Irrigated
Williams-Bowbells loams, 3 to 6 percent slopes		X		

4.11.1.2 Woodlands

Economically important forestry resources are not located on the PGS site. There are no tree and shrub plant species present due to the previous land use as agricultural and present land use as industrial.

4.11.2 Impacts

4.11.2.1 Agriculture/Farming

Impacts to agriculture will be nominal. No impacts are anticipated to animal health and safety due to the construction or operation of PGS Phase II including the 650 foot extension of PGS Phase I's 115-kV transmission line that will be required to deliver the power generated from PGS Phase II to MWEC's Stateline I Substation. The transmission extension requires two single pole galvanized steel structures. Except for the physical location of the two transmission structures and the PGS, the land surrounding the station will continue to be available for agriculture uses. Permanent impacts will occur in the area already disturbed for PGS Phase I. Any temporary impacts, such as soil disturbance and crop damage, would have already occurred during the construction of PGS Phase I.

The effect of heavy equipment on agricultural soils was considered. Compaction of soil is a concern where construction equipment is used intensively, even during a relatively short duration such as the construction season needed for transmission line installation.

4.11.2.2 Woodlands

No woodlots are located within the PGS so no impacts are anticipated. Temporary impacts resulting from ground disturbance has already occurred with the construction of PGS Phase I. No further agricultural

impacts are anticipated, with the exception of 0.002 acres for the installation of two transmission structure foundations.

4.11.3 Mitigation

4.11.3.1 Agriculture/Farming

Land based economies within the proposed generation station area are not expected to change because the site has been previously disrupted for PGS Phase I. There are no impacts anticipated because of the existing construction on the site and no mitigation is required. PGS Phase II will be constructed south of PGS Phase I (Figure 2). A 650 foot extension of PGS Phase I's 115-kV transmission line will be required to deliver the power generated from PGS Phase II to MWEC's Stateline I Substation. The transmission extension requires two single-pole galvanized steel structures (Figure 1). The permanent loss for agricultural purposes is quite minimal at 0.002 acres for Phase II that no mitigation is proposed.

4.11.3.2 Woodlands

No woodlots are located within the PGS site so no impacts are anticipated and no mitigation is proposed.

4.12 Soils

A soil association is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on a map (Soil Survey Staff & NRCS 2011).

4.12.1 Description of Resources

The soils in the PGS site are composed of one soil association; the Williams-Bowbells loam. The Williams series consists of very deep, well drained, moderately slow or slowly permeable soils formed in calcareous glacial till. The Bowbells series consists of very deep, well and moderately well drained soils formed in glacial till and alluvium from glacial till on glacial till plains and moraines (Figure 5).

4.12.2 Impacts

The project area is already under construction for PGS Phase I and no further soil impacts are expected from the generation station. A 650 foot 115-kV transmission line with two single pole galvanized steel structures will be required to deliver the power generated from PGS Phase II to the Stateline I Substation. (Figure 2).

4.12.3 Mitigation

The project area is already under construction for PGS Phase I and no further mitigation efforts are necessary within the PGS. Erosion control measures will be implemented as necessary for the construction of the two transmission line structures. Basin Electric will use BMPs during construction and operation of the transmission line to protect topsoil, adjacent wetland resources and minimize soil erosion. Practices may include containing excavated material, protecting exposed soil, stabilizing restored material and revegetating disturbed areas with native species.

4.13 Geologic and Groundwater Resources

4.13.1 Description of Resources

The bedrock geology in the PGS consists of the Paleocene Epoch aged (65.5 to 56 million years ago) Sentinel Butte Formation. The Sentinel Butte Formation consists of alternating beds of grayish brown to gray

sandstone, siltstone, mudstone, claystone, and lignite (USGS 2008a). It contains many river, lake, and swamp sediment and can range up to 200 meters (600 feet) in thickness.

The surficial geology in the PGS area is Pleistocene Epoch aged (2.6 million years to 11,700 years) Coleharbor Formation. The Coleharbor Formation is a moderately well sorted cross-bedded sand and plane-bedded gravel deposit of glacial till. The formation also includes sediment of melt-water and other river deposits and can reach a thickness of up to 30 - 200 meters (100 - 600 feet).

Oil and gas development is ongoing in the area surrounding the PGS. According to the North Dakota Department of Mineral Resources, more than 1.8 million barrels of oil have been produced in Williams County. Information about the exact locations and scope of future developments was not available as this information is generally confidential and proprietary. As a result, the exact well locations, the number of new wells, and associated impacts are not known at this time.

The Paleontology Portal and the U.S. Geological Survey (USGS) website did not identify any known paleontological resources near the PGS (USGS 2008b). The closest identified paleontological sites are in the Theodore Roosevelt National Park and Historic Medora areas, which are located more than 100 miles to the southwest of the PGS.

According to the North Dakota Geological Survey (NDGS), North Dakota is located in an area of very low earthquake probability. There are no known active tectonic features in south-central North Dakota and the deep basement formations underlying North Dakota are expected to be geologically stable (Bluemle 1991). This information is supported by USGS seismic hazard maps, which show that the PGS would be located in an area with very low seismic risk (USGS 2008a). Related hazards, such as soil liquefaction, are therefore also unlikely.

According to the USGS the PGS area is included in the Northern Great Plains regional aquifer system. Groundwater resources in the PGS area are included in the Fort Union and Fox Hills Formations, Tertiary period aquifers. Tertiary aquifers consist mostly of semi-consolidated to consolidated sandstone beds of Oligocene to Paleocene age (USGS 1996). These water-yielding sandstones are an important water source in the region. According to the North Dakota State Water Commission (NDSWC), water observation wells access groundwater resources as shallow as 6 feet below the ground surface (NDSWC 2011).

Review of the North Dakota State Water Commission (Commission) database indicates that there is a well 470 feet north of the northern PGS fence line. It shows a test hole drilled in 1965 with no observation well installed. No other wells are recorded in the area. No domestic wells in the area have been documented.

4.13.2 Impacts

There are no anticipated impacts to geologic resources. However if a unanticipated spill occurs at the PGS site Basin Electric has mitigation in place.

4.13.3 Mitigation

Geologic resources could potentially be impacted since there is the possibility with any construction activity of spilling fuel, hydraulic fluid, or other regulated materials. The specified contractor would minimize the likelihood of such an event by ensuring that refueling takes place at secure areas. Spill kits would be maintained at these sites to contain and clean up any spills that may occur. Construction crew members would be trained in spill prevention and clean up.

4.14 Surface Water and Floodplain Resources

4.14.1 Description of Resources

Surface water and floodplain resources for the PGS were identified by reviewing U.S. Geological Survey National Water Information System Maps, North Dakota State Water Commission Map Services, and USFWS National Wetlands Inventory (NWI) data

The PGS lies within the Painted Woods Creek watershed, while the transmission line structures associated with PGS Units 2 and 3 are located within the Little Muddy Creek watershed (Figure 6) (ND Department of Health-Division of Water Quality). All facilities are within an area of possible but undetermined flood hazards, as no flood hazard analysis has been conducted for the area.

4.14.2 Impacts

There are no surface water and floodplain resources impacts anticipated.

4.14.3 Mitigation

A NPDES permit, has been acquired by Basin Electric's Phase I Construction Contractor. The Contractor also has prepared a Storm Water Pollution Prevention Plan (SWPPP) for PGS Phase I. No impacts are anticipated therefore no mitigation is being proposed.

4.15 Wetlands

4.15.1 Description of Resources

Wetlands within the PGS were identified by reviewing NWI Maps (Figure 3). The USFWS uses aerial photographs as a basis for NWI maps. The NWI map provides guidance in determining areas to be evaluated for wetland characteristics, but should not be used as the sole basis for wetland determinations.

There were two Freshwater Emergent Wetlands, both less than approximately 0.1 acres, located on the 40 acre parcel within the NE $\frac{1}{4}$ SE $\frac{1}{4}$ of Sec 20, T1553N; R103W. The United States Army Corps of Engineers determined that these were isolated, intrastate and non-navigable and therefore non-jurisdictional. Therefore additional permit requirements are not required for their disturbance (dated February 9, 2012 and found in Appendix B).

4.15.2 Impacts

There are no jurisdictional wetlands within PGS. No impacts to wetlands are anticipated.

4.15.3 Mitigation

Wetlands will be avoided during the construction phase of the PGS Phase II. If USACE jurisdictional wetland impacts are unavoidable, then a Section 404 and 401 permit application will be submitted to the USACE and state of North Dakota, respectively. Permanent impacts to wetlands and waters will be mitigated according to regulatory requirements.

Basin Electric will use BMPs during construction and operation of the transmission line to protect topsoil, adjacent wetland resources and minimize soil erosion. Practices may include containing excavated material, protecting exposed soil, stabilizing restored material and revegetating disturbed areas with native species.

4.16 Vegetation

4.16.1 Description of Resources

The PGS is located in the Northern Dark Brown Glaciated Plains Region Major Land Resource Area (MLRA 2011) and the land resource unit/region (LRR) name for this same area is Northern Great Plains Spring Wheat Region. Native grasslands are largely replaced by spring wheat, alfalfa, and rangeland areas. The present vegetative cover in the area is primarily row crops, pastured mixed-grass prairie, and non-native grassland. Historically, vegetation in the western region of North Dakota consisted of mixed-grass prairie. This area may have supported natural prairie vegetation characterized by western wheatgrass (*Pascopyrum smithii*), needle-and-thread (*Hesperostipa comata*), green needlegrass (*Stipa viridula*), and blue grama (*Bouteloua gracilis*). Little bluestem (*Schizachyrium scoparium*) may have been present on shallow soils and some sage (*Salvia spp.*) could be found on droughty soils

Based on a review of aerial photographs, land use database information, USFWS database information, and a visit to the generation site, it was determined that the land area is agricultural land use. Additionally there are four oil/gas pads in the general vicinity of the PGS and the ONEOK Stateline I gas processing facility is located east of the PGS across 151st Avenue NW.

The principal crop in Williams County is wheat. Other crops include barley, lentils, and hay (USDA 2011 - Cropscape). Grasslands are used for range and pasture of cattle. Heavily grazed range typically contains Kentucky bluegrass, quack grass, and brome grasses. Lightly grazed or undisturbed range contains native prairie species. Additional information on agriculture and farming can be found in Section 4.10.

4.16.2 Impacts

Construction is already underway for the PGS Phase I and the only additional vegetation impacts anticipated are 0.002 acres for the two transmission structures associated with PGS Phase II.

4.16.3 Mitigation

The PGS is already under construction for the PGS Phase I and no mitigation is being proposed. Construction of the two transmission structures for PGS Phase II is anticipated to be 0.0002 acres. This construction is adjacent to the PGS Phase I site..

4.17 Wildlife

4.17.1 Description of Resources

Wildlife in the PGS vicinity (within 0.5 mile) consists of birds, mammals, reptiles, amphibians, and insects, both resident and migratory, which utilized the PGS habitat for forage, migratory stopover, breeding, and/or shelter. Species present in the PGS are associated with agricultural fields, pasture grasslands, and wetland areas. Common mammals in the PGS vicinity include raccoon, mink, skunk, weasel, white-tailed deer, coyote, red fox, badger, porcupine, and rabbit.

4.17.2 Impacts

The PGS is already under construction for PGS Phase I. No further impacts to wildlife are anticipated therefore no mitigation is being proposed.

4.17.3 Mitigation

No further impacts to wildlife are anticipated, however, the following measures, will be used, to the extent practicable, to help avoid potential impacts to wildlife near the PGS during facility design and operation:

- Single-pole steel structures will be used as the primary structure design for the transmission line. The proposed transmission line will be designed to meet APLIC raptor-safe design standards.
- Basin Electric will avoid or minimize disturbance of individual wetlands or drainage systems during construction and operation of the PGS.
- Basin Electric will maintain sound water and soil conservation practices during construction and operation of the PGS to protect topsoil and adjacent resources and to minimize soil erosion. To minimize erosion during and after construction, North Dakota BMPs for erosion and sediment control (SN 19389 9/99) will be utilized. These practices include: temporary seeding, permanent seeding, mulching, filter strips, erosion blankets, grassed waterways, and sod stabilization.
- Basin Electric will revegetate non-cropland areas with seeding mix as recommended by the NRCS.
- Basin Electric will inspect and control noxious weeds in the vicinity of the transmission line and associated facilities immediately after construction and periodically for the life of the project.

Basin Electric is committed to minimizing wildlife impacts within the PGS.

4.18 Rare and Unique Natural Resources

4.18.1 Description of Resources

The Endangered Species Act (ESA) of 1973, as amended, provides for the conservation of ecosystems upon which threatened and endangered species of fish, wildlife, and plants depend. Section 7 of the ESA requires federal agencies to insure that any action authorized, funded, or carried out by them is not likely to jeopardize the continued existence of listed species, or to modify their critical habitat.

Federally threatened species are those species likely to become endangered within the foreseeable future throughout all or a significant portion of their range. Federally endangered species are those species already in danger of extinction throughout all, or a significant portion of, their range. Table 4.18-1 below summarizes federally-designated species that may occur within or near the PGS. Of the six listed below, the whooping crane and Sprague's pipit have the highest potential of occurring in the PGS. Habitat for the other species is either completely lacking or is extremely limited in the PGS.

Table 4.18-1. Federally-Listed Threatened and Endangered Species

Species		Habitat and Range	Status
Common Name	Scientific Name		
Pallid sturgeon	<i>Scaphirhynchus albus</i>	Bottom dwelling, Missouri and Yellowstone Rivers	E
Piping plover	<i>Charadrius melodus</i>	Missouri River sandbars, alkali beaches	T, CH
Interior least tern	<i>Sterna antillarum</i>	Missouri River and Yellowstone sandbars; beaches;	E
Whooping crane	<i>Grus americana</i>	Wetlands; migrant western ND	E
Gray wolf	<i>Canis lupus</i>	Frequently observed in Turtle Mountains.	E
Sprague's pipit	<i>Anthus spragueii</i>	Native medium to intermediate height prairie.	C

Review of aerial photography and land cover maps of the PGS indicate that no suitable mixed-grass prairie habitat is present within the area therefore Sprague's pipits are unlikely to utilize this area. In addition, the cropped land cover has already been removed within the construction of the PGS Phase I.

Historic whooping crane observations do not indicate that the area is frequently used by whooping cranes for migration, stopover, or foraging (USFWS 2008). A response from the USFWS (dated August 8, 2012 and found in Appendix B) indicates that "no endangered or threatened species are known to occupy the Project Area and/or are not likely to be adversely affected".

4.18.2 Impacts

There are no impacts on rare and unique resources anticipated as a result of the construction of Phase II of the project.

4.18.3 Mitigation

The PGS is already under construction for the PGS Phase I and no mitigation efforts are necessary. The disturbance for the transmission structures is quite minimal at 0.0024 acres, and in close proximity to PGS Phase I that no mitigation is proposed.

4.19 Summary of Route Impacts

Table 4.19-1 summarizes the resources that will be impacted as a result of the construction of the project and the appropriate mitigation.

Table 4.19-1. Summary of Impacts and Mitigation

Resource	Impact	Mitigation
Demographics	Socioeconomic impacts are primarily positive due to increased expenditures during construction and the long-term benefits of an increased tax base of the county due to property taxes. A nominal amount of land will be permanently removed from production due to the construction of the Project.	Impacts are primarily positive, so no mitigation is proposed for socioeconomic impacts. Impacts to landowners will be minimized to the extent practicable.
Land Use	Approximately 7 acres of land have been permanently impacted due to the construction of PGS Phase I. A total of approximately 0.002 acres of land will be permanently impacted by the transmission line structure's foundations.	Basin Electric will work with landowners and regulatory agencies to minimize impacts of the PGS.
Public Services	No impacts are anticipated.	The PGS Phase II will be designed and constructed according to the configuration identified by NESC to mitigate any potential impacts. Impacts to existing public services will be avoided to the extent practicable.
Human Health and Safety	No impacts are anticipated.	Basin Electric will follow "prudent avoidance" methods to minimize EMF exposure and any potential impacts to human health. If proper safeguards are implemented, no additional mitigation is required.

Resource	Impact	Mitigation
Air	No impacts are anticipated.	Basin Electric has submitted and received a Permit to Construct from the NDDH for PGS Phase I. A permit for Phase II will be acquired prior to construction.
Noise	The noise sensitive land uses are the residences near the PGS and transmission line. Noise impacts are nominal. No impacts to noise sensitive land uses are anticipated.	No mitigative measures are proposed, as there are no noise sensitive land uses within 500 feet of the facility.
Visual	The PGS will be evident to individuals traveling on township and county roads in close proximity.	The PGS site minimizes the number of residences impacted by the station.
Cultural and Archaeological	No impacts to identified cultural resources are anticipated.	Basin Electric will avoid impacts to cultural resources
Recreational Resources	Impacts to recreational resources are not anticipated. Impacts that may occur would be primarily visual in nature.	PGS Phase II will avoid direct impacts to recreational areas.
Land Based Economies	A total of approximately 0.002 acres of land will be permanently impacted by the transmission line structure's foundations.	Basin Electric will work with landowners as necessary to minimize impacts to their land. Prime farmland will be avoided to the extent practicable.
Soils	Approximately 7 acres of land has been permanently impacted by the PGS Phase I. A total of approximately 0.002 acres of land will be permanently impacted by the transmission line structure's foundations.	BMPs for erosion and sediment control will be utilized to minimize wind and water erosion. Only land needed for the PGS Phase II will be permanently impacted. Temporarily disturbed areas will be restored.
Geologic and Groundwater Resources	No impacts to geologic and groundwater resources are anticipated.	No mitigative measures are necessary.
Surface Water and Floodplain Resources	No impacts are anticipated to intermittent streams and drainageways.	An NPDES permit and SWPPP has been acquired from the North Dakota Department of Health.
Wetlands	There are no anticipated impacts to wetlands.	Basin Electric will avoid wetlands to mitigate impacts.
Vegetation	Approximately 7 acres of land has been A total of approximately 0.002 acres of land will be permanently impacted by the transmission line structure's foundations.	Basin Electric will use BMPs during construction and operation to minimize impacts.
Wildlife	No impacts to wildlife populations are anticipated.	No mitigative measures are necessary.
Rare and Unique Natural Resources	Impacts to rare and unique natural resources are not anticipated.	No mitigative measures are necessary.

5 Public and Agency Coordination

Keeping the public informed on the status of the PGS Phase II development is a key component to its success. Principal stakeholders in the PGS area are landowners in the area and other oil/gas and energy interests.

Correspondence regarding PGS Phase II has been sent to the US Army Corps of Engineers, ND Department of Health, ND Game & Fish Department, State Historical Society of North Dakota, ND Parks & Recreation Department, US Fish and Wildlife Department, Natural Resources Conservation Service, Department of Defense, and the ND State Water Commission. Agency response letters for the Pioneer Generation Station Phase II Project are included in Appendix B. Note that responses were received from the USFWS, the NDDH, the NRCS, the NDSWC, the DoD, and the USACE.

6 Identification of Required Permits/Approvals

The Federal and state permits or approvals that have been identified as potentially being required for the construction and operation of the Project are shown in Table 6-1.

Table 6-1. Possible Permits and Approvals

Agency	Type of Approval	Status*	Need
Federal Approvals			
State of North Dakota			
Public Service Commission	Waiver of Procedures and Time Schedules	Subject of this Application	Included herein.
	Certificate of Site Compatibility	Subject of this Application	Included herein.
	Site Permit	Subject of this Application	Included herein.
North Dakota Department of Health	Air permit, Prevention of Significant Deterioration (PSD)	Application will be submitted in fourth quarter 2012	New facilities are required to obtain a Permit to Construct prior to construction.
	NPDES Permit: General Construction Storm Water	Permit acquired by Basin Electric's Contractor	Permits required if: <ul style="list-style-type: none"> land disturbance (clearing, grading or excavating) is greater than or equal to one acre, or land disturbance is less than one acre and the site is part of a larger common plan of development or sale with the total land area disturbed in the development being equal to or greater than one acre or, there is potential for contribution to a violation of a water quality standard or potential for significant contribution of pollutants to waters of the state Permit application requires the preparation of a Storm Water Pollution Prevention Plan (SWPPP).
North Dakota Highway Patrol	Over-height/Over-weight Permit	If required, applicant will apply once Certificate is received and prior to transporting equipment.	Permit required for hauling construction equipment and materials on state highways. Contractors will obtain as necessary
Williams County	Conditional Use Permit	Received – February 2012	Rezoned from Agricultural to Industrial

7 Factors Considered

NDCC Section 49-22-09 of the North Dakota Energy Conversion and Transmission Facility Siting Act lists 11 factors to guide the PSC in evaluation of the Site. The following sections address these factors where applicable to the PGS.

7.1 Public Health and Welfare, Natural Resources, and the Environment

The preceding sections discuss the research and investigations relating the effects of the proposed facility on public health and welfare, natural resources, and the environment. Chapter 4 details the research and investigations that were used to identify expected environmental impacts and mitigation in relation to the PGS Phase II. Chapter 3 discussed construction and operation techniques. All impacts evaluated in the PGS Phase II are minor.

7.2 Technologies to Minimize Adverse Environmental Effects

Basin Electric will utilize the most recent generation station technologies and systems that minimize impacts to the environment. Chapter 3 discusses the engineering and operational design of PGS Phase II, including the proposed unit type and construction techniques. These technologies and techniques are the most appropriate technologies to minimize adverse environmental effects. This is evident in the minimal environmental effects identified by the research and investigations discussed in this application.

7.3 Potential for Beneficial Uses of Waste Energy

This factor is not applicable to this project.

7.4 Unavoidable Adverse Environmental Effects

Chapter 4 details the research and investigations that were used to identify expected environmental impacts and mitigation in relation to PGS Phase II. The environmental effects of PGS Phase II are minor.

Unavoidable adverse environmental effects include the visual impacts and physical impacts to the land (primarily agricultural land) associated with the transmission structures. Basin Electric will implement the mitigation and BMPs discussed in this application and as identified by regulatory agencies to minimize these unavoidable adverse environmental effects.

7.5 Irreversible and Irretrievable Commitment of Natural Resources for the Corridor/Routes

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the use of these resources have on future generations. Irreversible effects primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action. There are few commitments of resources associated with this project that are irreversible and irretrievable, but include those resources primarily related to construction.

Resources that will be used to construct the project include aggregate resources, concrete, steel, and hydrocarbon fuel.

7.6 Direct and Indirect Economic Impacts

Direct economic impacts include the impacts associated with a small amount of agricultural land being removed from production due to the construction of the transmission line structure foundations. In general, agricultural areas surrounding the structure can still be farmed. The remaining direct and indirect economic impacts are primarily positive. To the extent that local contractors are used for portions of the construction, total wages and salaries paid to contractors and workers will contribute to the total personal income of the region. Additional personal income will be generated for residents in the county and the state by circulation and recirculation of dollars paid out by Basin Electric as business expenditures and state and local taxes. Expenditures made for equipment, energy, fuel, operating supplies, and other products and services also benefit businesses in the county and the state.

7.7 Existing Development Plans of the State, Local Government and Private Entities at or in the Vicinity of the Site

No conflicts with existing development plans were identified as part of this application. The following summarizes known development plans and reasonably foreseeable development.

In recent years, oil and gas development has continued to expand in the Williston area. It is reasonably foreseeable that areas near the PGS will be considered for gas and oil development. This is evidenced by the existing oil wells and the recently constructed ONEOK Stateline I gas processing facility in the vicinity of the PGS. The location of the PGS is not expected to inhibit the potential for future gas and oil development.

7.8 Effect of Site on Cultural Resources

Basin Electric has reviewed cultural resources information on file at the SHPO for the data gathering area and prepared a Class III Intensive Archaeological Resource Inventory report (available upon request from SHPO). A review of previous cultural resources studies and cultural resource recordation forms at the SHPO identified two previously recorded archaeological resources within the data gathering area. The result of the cultural resource effort is detailed in the Class III report. Currently, no impacts are anticipated to known or newly identified cultural resources. Basin Electric is committed to minimizing impacts to these resources and will avoid to the best of their ability these resources and any additional resources identified throughout the life of the project. If avoidance is not possible, Basin Electric will work with the North Dakota SHPO to develop appropriate treatment plans for the impacted site(s).

7.9 Effects of Site on Biological Resources

Chapter 4 discusses potential impacts to biological resources such as wetlands, vegetation, wildlife, and rare and unique species. Basin Electric has implemented measures to avoid and minimize effects to biological resources at the proposed site.

7.10 Effects of Site on Sensitive Species and Habitats

Federally-listed species are not known to occur within the PGS area and are not likely to be adversely impacted. Habitat for the other species listed is either completely lacking or is extremely limited in the PGS area.

7.11 Concerns Raised by Agencies

The area in the vicinity of the PGS was reviewed by state and federal agencies as part of this PSC permitting process. Agency comments varied according to agency function and jurisdiction, but agency comments generally emphasized a desire to minimize impacts to environmental resources such as wetlands, wildlife, and cultural resources. These environmental resources are addressed in Chapter 4 of this application. Agency response letters for the PGS (which includes the area of the Project) are included in Appendix B.

8 Definitions

Term	Definition
ADT	Average Daily Traffic
APLIC	Avian Power Line Interaction Committee
BMPs	Best Management Practices; prevents soil erosion and sedimentation
Basin Electric	Basin Electric Power Company
Capacity	The capability of a system, circuit, or device for storing electric charge.
Certificate	Certificate of Site Compatibility
Class I Cultural Resources Inventory	Existing data inventory – a large-scale review and compilation of known cultural resource data.
Class III Cultural Resources Inventory	Intensive field inventory – complete surface inventory of a specific area.
CRP	Conservation Reserve Program
Corridor Certificate	Certificate of Corridor Compatibility
dBA	A-weighted decibel
Electromechanical	Of, relating to, or being a mechanical process or device actuated or controlled electrically; especially being a transducer for converting electrical energy to mechanical energy.
EMF	Electric and Magnetic Field
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
FPPA	Farmland Protection Policy Act
Ft	Foot/Feet
Geotechnical	A science that deals with the application of geology to engineering.
GIS	Geographic Information Services
kV	kilovolt
m	meter
mG	milligauss
MWEC	Mountrail Williams Electric Cooperative

Term	Definition
NDDOT	North Dakota Department of Transportation
NESC	National Electric Safety Code
NDAC	North Dakota Administrative Code
NDCC	North Dakota Century Code
NDDH	North Dakota Department of Health
NDGFD	North Dakota Game and Fish Department
NDPRD	North Dakota Parks and Recreation Department
NHID	Natural Heritage Inventory Database
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resource Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
Project, the	Williston Tie Project
PSC	North Dakota Public Service Commission
RECs	Recognized Environmental Conditions
Resistance	The opposition offered by a body or substance to the passage through it of a steady electric current.
RD	Rotor Diameter: Diameter of the rotor from the tip of a single blade to the tip of the opposite blade.
ROW	Right-of-Way
SHPO	North Dakota State Historic Preservation Office
SoCP	Species of Conservation Priority
SWPPP	Storm Water Pollution Prevention Plan
Transmission	An assembly of parts including the speed-changing gears and the propeller shaft by which the power is transmitted from an automobile engine to a live axle; the speed-changing gears in such an assembly.
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

Term	Definition
WMA	Wildlife Management Areas
WMD	Wetland Management District
WPAs	Waterfowl Protection Areas

9 Qualifications

Table 9-1. Basin Electric Power Cooperative Qualifications

Name Project Role	Education And Professional Experience
MYRON STECKLER Project Manager	B.S. Mechanical Engineering 15 Years Experience Registered Professional Engineer
DAVE ERICKSON Project Engineer	B.S. Civil Engineering 34 Years Experience Registered Professional Engineer
CRIS MILLER Environmental Permitting	B.S. Civil Engineering 30 Years Experience Registered Professional Engineer
BECKY KERN	B.S. Electrical Engineering 10 Years Experience
MIKE MURRAY Right-of Way	A.A. Business Administration Various Courses through International ROW Association SR/WA (Senior ROW designation) 12 years experience
JASON BREKKE GIS Analyst	B.S. Geography 8 years Experience
CURT PEARSON Corporate Communications	B.S. Business Administration M.B.A. Certified Cooperative Communicator 35Years Experience

Table 9-2. HDR Engineering, Inc. Qualifications

Name Project Role	Education And Professional Experience
KELLY GARVEY Project Manager	<p>Ms. Garvey currently is a project manager with 23 years of experience focused on environmental review and environmental permitting. She has prepared and managed consultants in the preparation of environmental documents and studies for compliance with NEPA, Section 4(f), and applicable environmental laws and executive orders. She has worked with several federal and state agencies on environmental documents and permitting issues.</p> <p>Associate of Applied Science, Environmental Studies, Arrowhead Community College Vermilion, 1981</p>
STEPHEN SABATKE Archaeologist	<p>Mr. Sabatke has ten years of experience working in the cultural resource field. He has worked on a variety of cultural resource projects including: wind power transmission, transmission lines, rail roads, pipeline, recreation use development, prehistoric site preservation, historic building preservation, and historic building rehabilitation. Additionally, he has prepared cultural resource studies for federal and state review. He has reviewed and developed cultural resource plans, cultural resource proposals, conducted meetings with SHPO, led field survey investigations, managed cultural resource contractors, subcontractors, and staff, and has managed cultural resource budgets for projects.</p> <p>M.A., Anthropology, University of Minnesota Twin Cities, 2006 B.A., Anthropology, University of Minnesota Duluth, 2002</p>
GREG RAETZ Air specialist	<p>Mr. Gregory Raetz has more than 15 years of experience as a project manager and lead technical permit engineer in the areas of air quality regulatory compliance, air quality permitting, and atmospheric dispersion modeling. He is responsible for the management of multi-level permitting projects with respect to regulatory strategy and environmental review programs. His areas of expertise include federal Prevention of Significant Deterioration (PSD) Construction Permit preparation, Title V Operating Permit preparation, Title IV permitting, State Implementation Plan (SIP) permitting; permitting enforcement actions, air toxics risk analysis, and ambient air quality dispersion modeling using ISCST3, AERMOD, and CALPUFF.</p> <p>Bachelor of Science, Environmental Engineering, Montana Tech of The University of Montana, 1994</p>
MATT WETZEL Technical Editor	<p>Mr. Wetzel has more than 20 years of experience in the writing, editing and technical editing field. He has worked on a variety of cultural resources, environmental science and environmental impact statements for NEPA; and also on projects in the air quality, water resource, and the noise and transportation field. He has also edited proposals in those areas. Additionally, he edited annual reports for the Midwest Independent Transmission System Operator, Inc.</p> <p>B.A., Journalism, University of St. Thomas, 1981</p>

Name Project Role	Education And Professional Experience
ANN FOSSUM GIS Specialist	<p>Ms. Ann Fossum is a GIS specialist with experience in spatial analysis, editing, data creation, conversion, map production, modeling, and GPS data collection and processing. She has applied her GIS knowledge to assist in the development of power transmission and wind farm projects throughout the United States, including NEPA and permit application document support. She has experience with ArcGIS, MapInfo, MicroStation and various other GIS software and utilities.</p> <p>Bachelor of Arts, Geography, Gustavus Adolphus College, 2004</p>
AMY PROK Environmental Scientist	<p>Ms. Prok is currently an environmental scientist intern in for NEPA. She has contributed to the siting and routing process of transmission lines by performing windshield surveys, writing PUC and PSC permits, and contacting state and federal agencies. She also has experience in conducting avian surveys, preparing environmental reports, and working with GIS.</p> <p>B.S., Biology, St. Olaf College, In Process</p>
CAROL ANN SERSLAND, AICP, GISP Environmental Scientist	<p>Ms. Sersland is an Environmental Planner and GIS analyst. Ms. Sersland has provided analysis and mapping support for land use studies in the form of data acquisition, data creation, conversion, and GIS analysis. Her environmental documentation and permitting experience includes natural resource assessments, highway/transit corridor studies, and office developments. She has extensive experience working with county zoning regulations and land development issues.</p> <p>B.S., Recreation Resource Management, University of Minnesota – St. Paul, 1981.</p>

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