ENVIRONMENTAL ASSESSMENT
Lonesome Creek Station
Units 2 & 3 Project
Basin Electric Power Cooperative
McKenzie County, North Dakota

prepared for

USDA Rural Utilities Service

August 2013

prepared by

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ACRONYM LIST

ACHP	Advisory Council on Historic Preservation
Btu/kWh	British thermal units per kilowatt-hour
CEQ	Council on Environmental Quality
CFC	National Rural Utilities Cooperative Finance Corporation
CFR	Code of Federal Regulations
CO	carbon monoxide
dB	decibel
dBA	A-weighted decibel
DC	direct current
DSM	demand-side management
EA	environmental assessment
EIS	environmental impact statement
EMF	electromagnetic field
EO	Executive Order
EPA	U.S. Environmental Protection Agency
FIRM	Flood Insurance Rate Map
GE	General Electric
GHG	Greenhouse gas
gpm	gallons per minute
HHV	higher heating value
HUD	Housing and Urban Development
IS	Integrated System planning area (WAUE)
kV	kilovolt
kV/m	kilovolt per meter
LCS	Lonesome Creek Station
L_{dn}	24-hour average sound level
L_{eq}	average sound level
MEC	McKenzie Electric Cooperative
mG	milligauss
MMBtu	million British thermal units
MSL	mean sea level
MW	megawatt
MWh	megawatt-hour
NAAQS	National Ambient Air Quality Standards
NDDH	North Dakota Department of Health
NDDMR	North Dakota Department of Mineral Resources
MISO	Midwest Independent System Operator
NDPC	North Dakota Petroleum Council
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_x	nitrogen oxides
NRI	Nationwide Rivers Inventory
NSPS	New Source Performance Standards
PSD	Prevention of Significant Deterioration
RFFA	reasonably foreseeable future actions
ROI	Region of Influence
RUS	Rural Utilities Service
SCCT	simple cycle combustion turbine
SCR	selective catalytic reduction
SHPO	State Historic Preservation Officer
SPP	Southwest Power Pool
SWPPP	Storm Water Pollution Prevention Plan
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WAUE	Western Area Power Administration Upper Great Plains Region East

1.0 INTRODUCTION

Basin Electric Power Cooperative (Basin Electric) is a regional wholesale electric generation and transmission cooperative owned and controlled by its member cooperatives. Basin Electric includes 134 rural electric systems operated by member cooperatives and serves approximately 2.8 million customers in 540,000 square miles covering portions of nine western states: Colorado, Iowa, Minnesota, Montana, Nebraska, New Mexico, North Dakota, South Dakota, and Wyoming. Basin Electric proposes to add two new 45-megawatt (MW) simple-cycle units to generate electricity at their existing Lonesome Creek Station in McKenzie County, North Dakota.

Within the Basin Electric service area, McKenzie, Mountrail and Williams Counties in northwestern North Dakota are experiencing a rapid increase in development as a result of the Bakken oil shale extraction activities. Future planned development would require increases in infrastructure throughout the region, including an increase in electrical generation capacity and reliability. Through studies of power supply for the region and the upper Midwest, Basin Electric has determined that an additional 905 MW would be needed to increase the electrical generation capacity and enhance the reliability of the power generation system for northwestern North Dakota by 2025.

Basin Electric proposes a number of actions to provide needed additional generating capacity and to improve reliability. One proposed action would construct the Antelope Valley to Neset Transmission Line, which is the subject of a separate Environmental Impact Statement (EIS). A second proposed action would increase the capacity of the Pioneer Generation Station in Williams County. A third proposed action would increase the capacity of the Lonesome Creek Station in McKenzie County and is the subject of this document. The proposed Project studied in this document would add two 45-MW simple cycle combustion turbine (SCCT) generation units to the single 45-MW unit at Lonesome Creek Station.

Basin Electric intends to request financing assistance from the U.S. Department of Agriculture (USDA) Rural Utilities Service (RUS), which would make the proposed Project a federal action subject to review under the National Environmental Policy Act of 1969 (NEPA), the National Historic Preservation Act (NHPA), and all applicable federal environmental laws and regulations. Basin Electric is not requesting financing assistance for the Pioneer Generation Station; nor did Basin Electric request financing assistance for the single 45-MW generation unit already permitted at Lonesome Creek Station.

This Environmental Assessment (EA) was prepared in accordance with 7 Code of Federal Regulations (CFR) Part 1794, RUS Environmental Policies and Procedures, and 40 CFR Parts 1500-1508, the regulations promulgated by the Council on Environmental Quality for implementing NEPA. This EA also

addresses other laws, regulations, executive orders, and guidelines promulgated to protect and enhance environmental quality including, but not limited to, the Endangered Species Act, the Farmland Protection Policy Act, the Clean Water Act, and executive orders governing flood plain management, protection of wetlands, and environmental justice.

2.0 DESCRIPTION OF THE PROPOSED PROJECT

Lonesome Creek Station (LCS) located at 2648 NW 140th Avenue, Alexander, McKenzie County, North Dakota, approximately 15 miles west of Watford City. Basin Electric owns 160 acres in the southwest quarter of Section 23, Township 150 N, Range 101 W. The complete LCS facility property is 48.4 acres on the northern portion of the 160-acre property.

The final planned LCS project consists of two phases, Phase I and Phase II. Phase I includes a single 45-MW generating unit (Unit 1). Phase I began construction in July 2012 and began commercial operation in June 2013. Phase II is the proposed Project. It would include two new 45-MW SCCTs (Units 2 and 3). Together LCS Phase I and Phase II would cover seven acres. During construction, there would also be a 22-acre laydown yard area available adjacent to and east of the LCS Phase II site.

The proposed Project would use two General Electric (GE) LM6000 turbines with an output rating of a nominal 45 MW and approximate heat rate of 9,300 British thermal units/ kilowatt-hour (Btu/kWh) higher heating value (HHV) for each unit. The units would use dry low-nitrogen oxide (NO_x) burner technology along with an anhydrous ammonia-based selective catalytic reduction (SCR) system for NO_x control. Also, the proposed Project would include equipment to reduce carbon monoxide (CO) emissions. The units' flue gas would be released to the atmosphere through an 80-foot-tall stack. The proposed Project would utilize the existing operator and maintenance building which would be supported by two full-time employees and includes the water treatment area for the demineralizer trailers, service pumps, and demineralized water forwarding pumps. The proposed Project would be designed to be operated locally at the site or remotely from either Basin Electric's Culbertson Station located near Culbertson, Montana or Basin Electric's Headquarters located in Bismarck, North Dakota.

LCS Phase I consists of Unit 1, a 45-MW simple-cycle CT with a clutch attached to isolate the CT from the generator. With the clutch engaged, the generator acts similar to a synchronous condenser, thereby providing much-needed voltage support to the local transmission system during times that generation is not required. The proposed Project, LCS Phase II, includes developing Units 2 and 3, each of which would be identical to LCS Unit 1, with the exception that there would not be a clutch.

Natural gas would be transported to the LCS site by the Northern Border Pipeline that runs immediately adjacent to the site. A ten-inch tap was installed on the Northern Border 42-inch pipeline for LCS Phase I, and the tap would be large enough to provide for all three units.

Electrical interconnection for the new units would be to an on-site 115-kV transmission line that extends from LCS to McKenzie Electric Cooperative's (MEC's) Hay Butte Substation located approximately two miles southwest of LCS. The transmission line is already constructed and is large enough to provide for all three units.

All storm water runoff would be diverted to an on-site pond. The storm water runoff pond was designed to hold runoff from a 25-year, 24–hour rainfall event and is large enough to handle runoff from the entire site including the area for the two new units. In addition to storm water, the pond would receive spray mist water blowdown and overflow. The spray mist is demineralized water used to cool air inlet temperatures, which increases power output, especially during peak summer demand.

Potable water is supplied to LCS from the local rural water distribution system and placed into the 125,000-gallon service water tank. Water requirements for the existing unit range from very little in the winter to approximately 25 gallons per minute (gpm) during the summer. To accommodate all three units, the maximum total water consumption for LCS would increase from 25 gpm to 75 gpm (assumes each unit would use 25 gpm). The potable water is further treated through utilization of a portable demineralization trailer and placed into the 220,000-gallon demineralized water storage tank. The demineralizer trailer is provided by an outside contractor. When required, the demineralizer trailer is regenerated off site. The demineralizer operations and water storage tanks developed for the existing facility are sufficient for all three units. All process water would be evaporated on site or, if required, hauled off site to a licensed waste facility.

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

This proposed Project is expected to start construction in May 2014 and the anticipated commercial operation date is December 2014. At the peak of construction, the estimated work force would be approximately 75 employees.

Figure 2-1 provides a vicinity map and Figure 2-2 provides the projected site layout for LCS.

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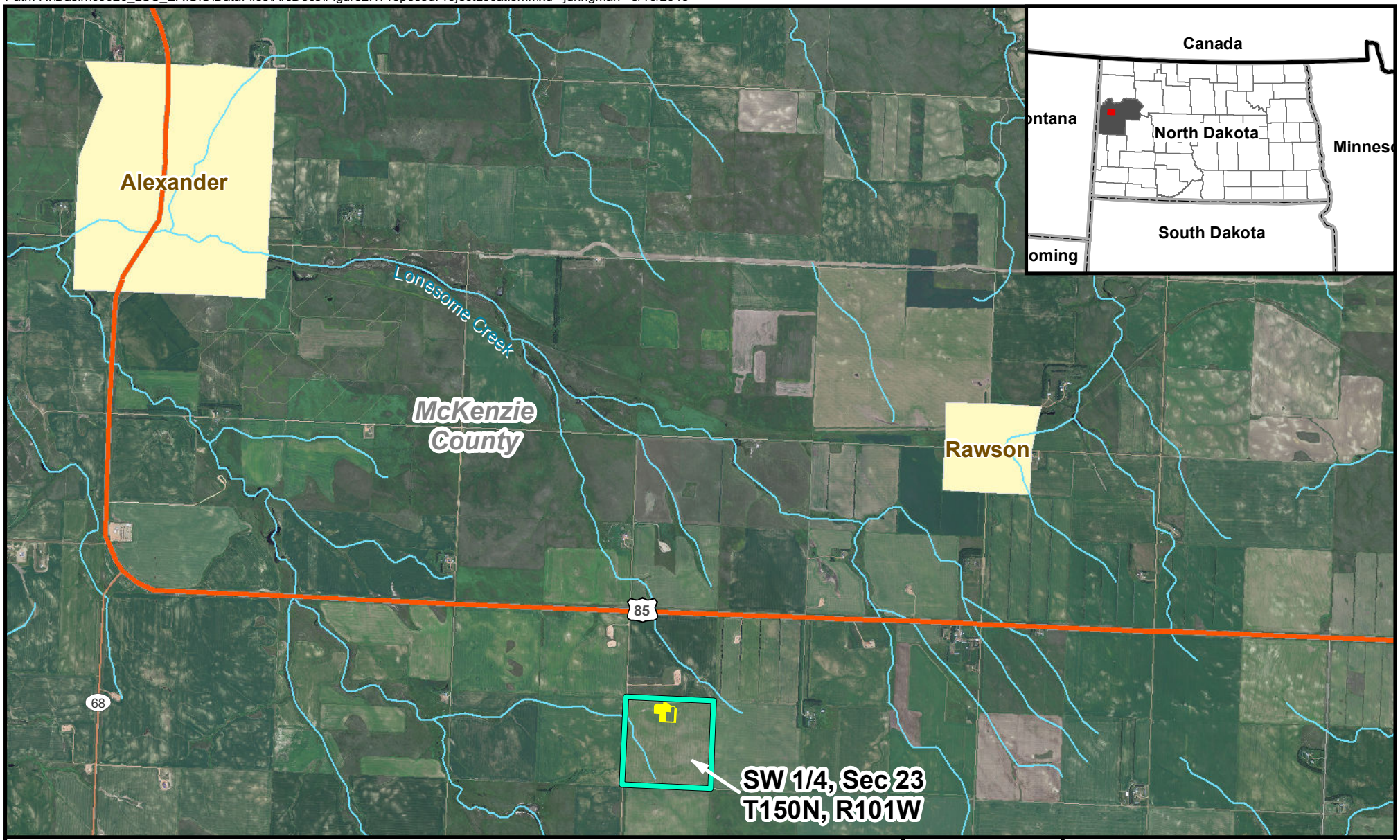

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Figure 2.1
Proposed Project Map
Basin Electric Power Cooperative
McKenzie County, ND

Source: USDA NAIP 2012 Aerial Photography, McKenzie County Mosaic, ESRI, and Burns & McDonnell

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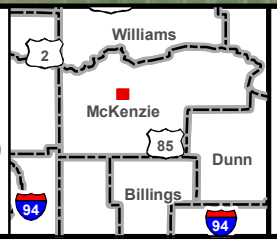
Energy Conversion Facility
Phase II Equipment
Plant Site Boundary
Laydown Area

NORTH

300 150 0 300

Scale in Feet



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SINCE 1898

Figure 2.2
Site Layout
Lonesome Creek Station
Basin Electric Power Cooperative
McKenzie County, ND

Source: Burns and McDonnel, 2010 Microsoft Corporation and its data suppliers - Bing Aerial Photography

Issued: 8/16/2013

3.0 PURPOSE AND NEED FOR THE PROPOSED PROJECT

Basin Electric's primary mission is to provide electrical power to its member-owners. 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 member-owners. Two studies are jointly prepared by the members and Basin Electric to address where the members presently use their electricity (end use survey) and how much power the members will require in the future (load forecast). The end use survey provides an understanding of how the consumers are presently using their electricity and is the starting point for a forecast of the consumers' future electrical requirements, or load. End use surveys and load forecasts are prepared for all Basin Electric members, except Tri-State, which conducts its own studies. Individual studies are prepared for each of the participating distribution cooperatives, and then the studies are combined to generate a Basin Electric report.

3.1 Load Forecast

The Basin Electric load forecast indicates an acceleration of growth in northwestern North Dakota, mainly resulting from development related to the Bakken oil field. Much of the short-term load growth in this area is associated with provision of electrical service to support the rapid expansion of oil and natural gas production, as well as the supporting infrastructure and services. This relatively rapid upswing in development activity in recent years is due to new exploration and extraction technology and the potential for oil recovery from the Bakken Formation. This additional growth creates a stress on existing generation and transmission facilities.

Most of North and South Dakota is in the Integrated System (IS) planning area of the Basin Electric system. This is also known as the Western Area Power Administration Upper Great Plains Region East (WAUE) planning area, and is part of the Eastern Interconnection. The boundary between the Eastern and Western Interconnections runs roughly in a line from Fort Peck to Miles City, Montana, and then southward along the eastern boundaries of Wyoming and Colorado. Basin Electric's resources in the Eastern Interconnection are power plants and wind energy projects. The proposed project is located in the Eastern Interconnection.

When the load forecast plus other obligations (such as non-member sales, losses, and reserves, less Basin Electric's system-wide load management) is subtracted from existing and committed generating resources along with purchases, the amount of surplus capacity on Basin Electric's system can be determined. Since Basin Electric's member systems reside within both the Eastern and Western Interconnections and there is

limited capability in moving power between the systems, Basin Electric further narrows its view on load and capability to the Eastern and Western Interconnections.

Figure 3-1 shows Basin Electric's western system summer season surplus capacity. The western system shows a surplus throughout the study period. Basin Electric has access to direct current (DC) ties to move power between the eastern and western systems. Transfers would allow Basin Electric to move surplus west-side generation to the east. The transfers would be in amounts up to the capability and rights to the ties, which are currently 240 MW in a west-to-east direction. Transfers utilizing these DC ties are not incorporated into Figure 3-1.

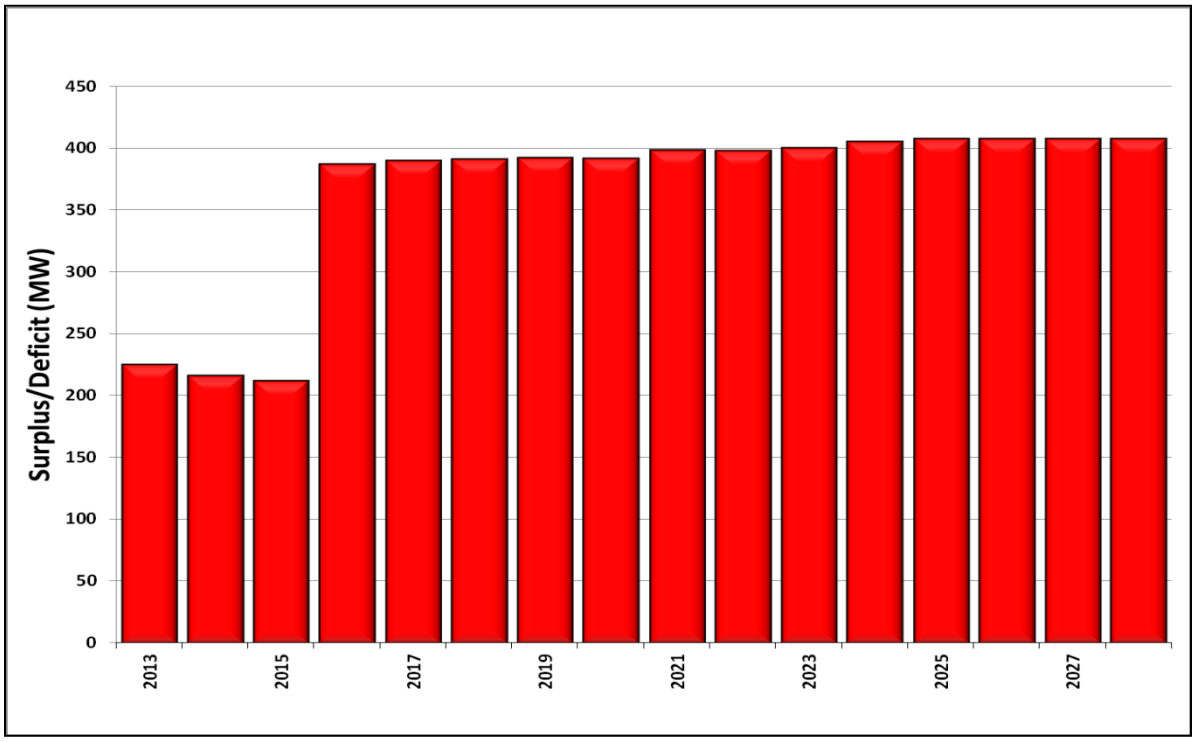

Figure 3-1: West System Surplus Capacity

Figure 3-2 shows Basin Electric's eastern system summer season surplus capacity. Basin Electric's eastern system is projected to be in a deficit of 28 MW in 2014. This deficit is forecasted to grow more each year.

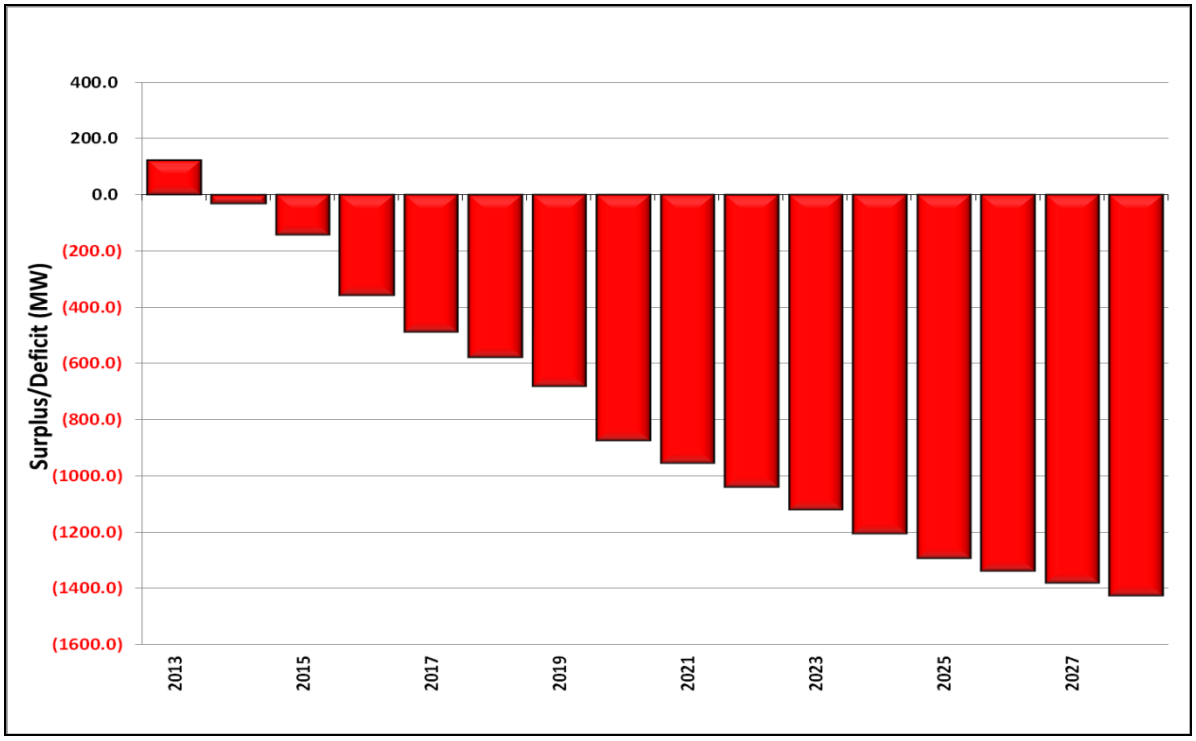

Figure 3-2: East System Summer Surplus/Deficit

Basin Electric's eastern system can be broken into three areas, the IS, the Southwest Power Pool (SPP) and the Midwest Independent Transmission System Operator (MISO). Figure 3-3 shows Basin Electric's IS (WAUE) system. The IS is a transmission partnership between Western Area Power Administration, Basin Electric, and Heartland Consumer Power District (HCPD). This is the portion of the eastern system showing the greatest growth over the forecasted period. This area encompasses the oil-developing region known as the Williston Basin or Bakken oil field. Figure 3-3 does include anticipated transfers across DC ties—the Rapid City DC Tie and the Stegall DC Tie—which are available to transfer power from the west to the east. The graph shows the IS (WAUE) to be in a deficit of 48 MW in 2016. This deficit is forecasted to grow more each year, to 172 MW by 2017 and to 905 MW by the end of the forecast period. If the DC Tie transfers are unavailable, or if there is no surplus on the west to move east, the IS (WAUE) would show a deficit of 166 MW in 2014 and this deficit would continue to grow more each year.

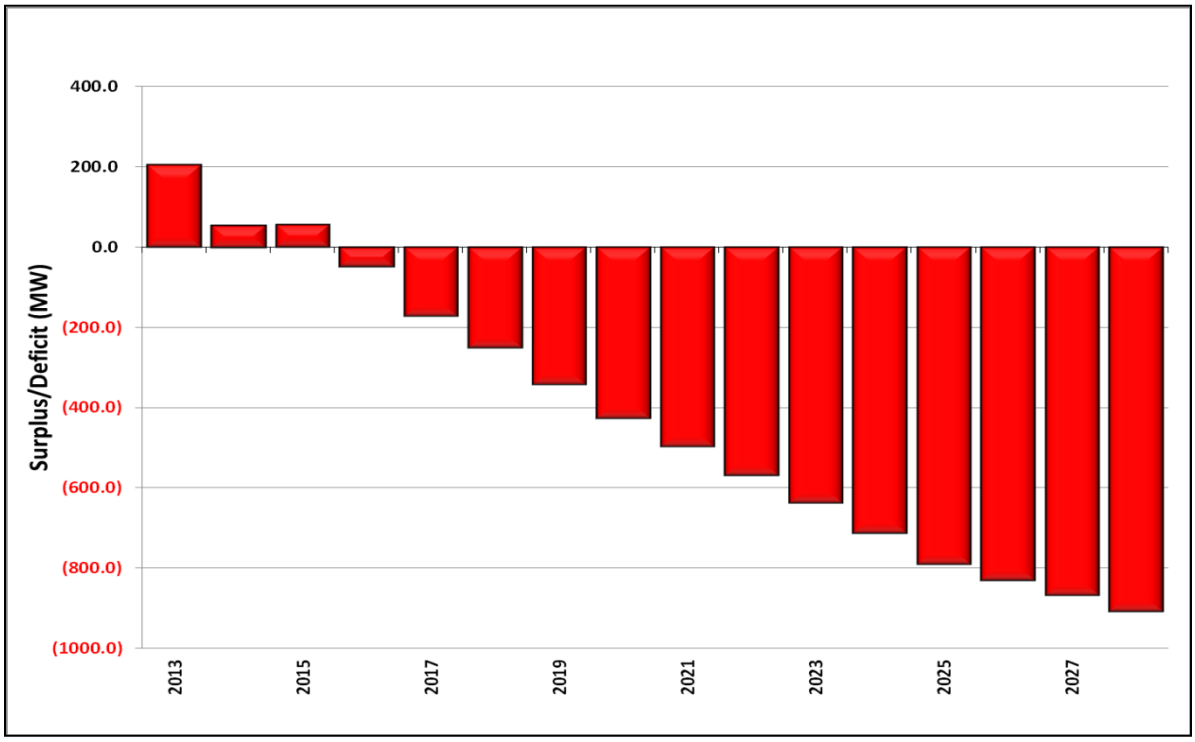

Figure 3-3: IS (WAUE) System Surplus/Deficit

The high voltage transmission system into the Williston Basin area is very close to its maximum load-serving capacity; that is, the load-serving ability of the area may be impacted until additional transmission facilities are built to bring power into the region or Basin Electric has the ability to start generation located within the area. Currently Basin Electric is in the process of building a 345-kV high voltage transmission line from Antelope Valley Station to Williston to Tioga, scheduled to be completed in 2016. Until that line is completed, the growing load in this area would be constrained by transmission capacity which limits the amount of load that can be served in the area without the support of local generation.

Basin Electric will need some local generation in 2014 and 2015 to help with transmission reliability issues in the Williston Basin area until the 345-kV high voltage transmission line from Antelope Valley Station to Williston to Tioga can be completed. The local generation would also provide for support during transmission outages once the line is in place as well as support the transmission system if the load within the area grows faster than is currently forecasted. A more detailed description of the load forecast, including methodologies and assumptions, is included in Appendix B.

3.2 Basin Electric Purpose and Need

As indicated in the load forecast (section 3.1 and Appendix B), the Basin Electric service area of northwestern North Dakota is experiencing a rapid increase in development as a result of activities associated with the extraction of oil from the Bakken Formation, currently concentrated in McKenzie, Montrail, and Williams Counties. The Bakken Formation is a thin, widespread geologic formation consisting of oil-generating shale and sandstone layers that extends through portions of Montana, North Dakota, and the Canadian Provinces of Saskatchewan and Manitoba (USGS 2008). While there are 17 oil-producing counties in North Dakota, all of which are located in the western third of the state, the top-producing counties in 2011 included Mountrail, McKenzie, Dunn, Williams, and Bowman in northwestern North Dakota (NDPC 2012). Oil production in North Dakota increased from 79.7 million barrels of oil in 2009 to 113 million barrels in 2010 (42 percent increase year over year) to 153 million barrels in 2011 (35 percent increase year over year) (NDPC 2012). Production is expected to continue to increase with an estimated 1,100 to 2,700 new wells per year in western North Dakota and 26,000 new wells cumulatively over the next 10 to 20 years (NDDMR 2011).

Infrastructure development related to the expanding oil and gas industry activity in the region includes pipelines, rail, natural gas plants, homes, businesses, roads, and transmission/distribution lines. Pipeline infrastructure is being developed to transport crude oil out of the Bakken oil field to refinery and marketing hubs, such as the U.S. Gulf Coast. Pipeline infrastructure is also being developed to transport natural gas, fracking water, and salt water. Crude oil is being transported by rail out of the Bakken oil field, and expansion of rail infrastructure and associated loading and unloading facilities is under development. Natural gas plants are expanding to process natural gas for consumer use. Local transmission lines for distribution have recently been constructed or are in development in western North Dakota to support the expanding drilling activity and associated infrastructure.

As indicated in the load forecast (Appendix B), Basin Electric forecasts a load growth of 905 MW in the Williston Basin by 2025. Studies of power supply for the region indicate that there are system reliability issues and that new generation is needed in McKenzie County to stabilize power supplies while awaiting completion of new transmission lines and other infrastructure. Basin proposes to develop additional simple-cycle CT generation at an existing power facility to accomplish this.

3.3 Rural Utilities Service Purpose and Need

The RUS electric program provides capital loans to electric cooperatives for the upgrade, expansion, maintenance, and replacement of the electric infrastructure in rural areas. Basin Electric is pursuing

financing for the LCS Phase II additions. The RUS purpose and need is to respond to Basin Electric's application for financial assistance.

4.0 ALTERNATIVES EVALUATED

A number of demand-side and supply-side resource alternatives were considered as a means of meeting the forecasted electrical needs for Basin Electric. The alternatives evaluated included:

- Demand Side Management
- Baseload Capacity
- Intermediate Capacity
- Peaking Capacity
- Purchased Power / Request for Proposal

4.1 Demand Side Management

Demand-side Management (DSM) is the process of managing the consumption of energy, generally to optimize available and planned generation resources. DSM refers to actions taken on the customer's side of the meter to change the amount or timing of energy consumption. DSM programs offer a variety of measures that can reduce energy consumption and consumer energy expenses. DSM strategies have the goal of maximizing end-use efficiency to avoid or postpone the construction of new generating plants.

DSM programs aim to achieve three broad objectives: energy conservation, energy efficiency and load management. Energy conservation can reduce the overall consumption of electricity by reducing the need for heating, lighting, cooling, cooking and other functions. Energy efficiency encourages consumers to use energy more efficiently, thus more effectively. Load management allows generation companies to better manage the timing of their consumers' energy use and helps reduce the large discrepancy between on-peak and off-peak demand.

Basin Electric and its members are engaged in a variety of conservation and energy efficiency programs. The programs and activities were developed to promote, support and market such technologies as efficient dual heat, water heaters, heat pumps, air conditioning, storage heating, grain drying, and irrigation. Other examples are photovoltaic generation and energy audits. A number of Basin Electric's members have developed DSM programs. These vary depending on the cooperative; some elect to utilize rebates, others use energy resource conservation loans, others use variable rates, some use all three and some elect not to adopt any of the programs.

Prior to 2011, Basin Electric surveyed its membership directly on all DSM activities and reported the information. Starting in 2011 Basin Electric adopted the new RUS and National Rural Utilities

Cooperative Finance Corporation (CFC) energy efficiency information reported by Basin Electric's members on RUS Form 7 part P or CFC Form part S documents.

Energy conservation and efficiency programs can lessen the demand for electricity, therefore reducing the capacity needed from additional future generation facilities. However, energy savings through DSM are not enough to alleviate the need for additional peaking capacity resources.

4.2 Baseload Capacity

The most economical means of supplying power to a load that varies every hour on an electric power system is to have three basic types of generating assets available for use. These generation assets are commonly referred to as baseload, intermediate, and peaking capacity.

Baseload capacity runs at its full capacity continuously throughout the day and night, all year round. The output of baseload-type plants cannot be rapidly decreased or increased to "follow load." Baseload units are designed to optimize the balance between high capital/installation cost and low fuel cost that will give the lowest overall production cost under the assumption that the unit will be heavily loaded for most of its life. Typically, baseload capacity units are operated at an 80 percent capacity factor or more. Coal-fired steam–cycle power plants, nuclear plants, and hydroelectric plants are examples of baseload generation capacity; however, hydro plants that follow load are not baseload units. Some renewable forms of energy, such as geothermal, biomass power, biogas power, and municipal solid waste are typically used in a baseload generation mode and are most cost effective in this mode of operation. While baseload capacity units are being contemplated for inclusion in Basin Electric's resource expansion plan, because of the locality of the load area and the timing required for the new generation to be operational, baseload capacity units were not considered responsive to the immediate need for power in McKenzie County and the Bakken oil field.

4.3 Intermediate Capacity

Intermediate capacity units are designed to be "cycled" at low load periods, such as evening and weekends. The units are loaded up and down rapidly to handle the load swings of the system while the unit is online. Typically, intermediate capacity units are operated between 20 and 80 percent capacity factor, or between baseload and peaking. Technologies for intermediate load plants include oil or gas-fired steam cycle plants, combined cycle plants, some hydroelectric plants, and internal combustion engine generators. Renewable generation types such as wind, solar, and hydroelectric are intermediate resources. Wind and solar are intermittent resources that cannot be scheduled when to operate. Their capacity factor is between 20 and 50 percent. Hydroelectric power generally operates between 40 and 50

percent capacity factor; however, it is very dependent on annual rainfall and therefore can go through some long periods of low generation.

While intermediate capacity units are being contemplated for inclusion in Basin Electric's resource expansion plan, because of the locality of the load area and the timing required for the new generation to be operational, intermediate capacity units were not considered responsive to the immediate need for power in McKenzie County and the Bakken oil field.

4.4 Peaking Capacity

Peaking capacity is only operated during peak load periods and during emergencies. Very low capital/installation costs are very important due to the fact these units are typically not operated for long periods. The production costs are relatively high due to the high cost and volatility in the price of fuel; this is why operation of these resources is limited. Types of peaking capacity power plants include combustion turbines, internal combustion engine plants, and pumped storage hydroelectric facilities. Typically, peaking capacity is operated at a capacity factor of 20 percent capacity or less.

Simple cycle is a type of natural gas-fired combustion turbine generator application. In SCCT operation, gas turbines are operated alone, without any recovery of the energy in the hot exhaust gases. SCCTs in the power industry require smaller capital investment than coal, nuclear or even combined cycle natural gas plants, and SCCT can be designed to generate small or large amounts of power. Also, the actual construction process can take as little as several weeks to a few months, compared to years for baseload power plants. Another main advantage of SCCT is that they can be turned on and off within minutes, supplying power during peak demand or during transmission outages. Since they are less efficient than combined cycle plants, they are usually operated as peaking power plants, which primarily are used during the peak summer months and less than a total of 2,000 hours per year. A typical large SCCT may produce 45 to 150 MW of power and have 35 to 40 percent thermal efficiency, with some reaching up to 46 percent efficiency. SCCTs are rarely used in baseload capacity units because of the lower heat rate efficiencies. Figure 4-1 shows a typical SCCT process flow diagram.

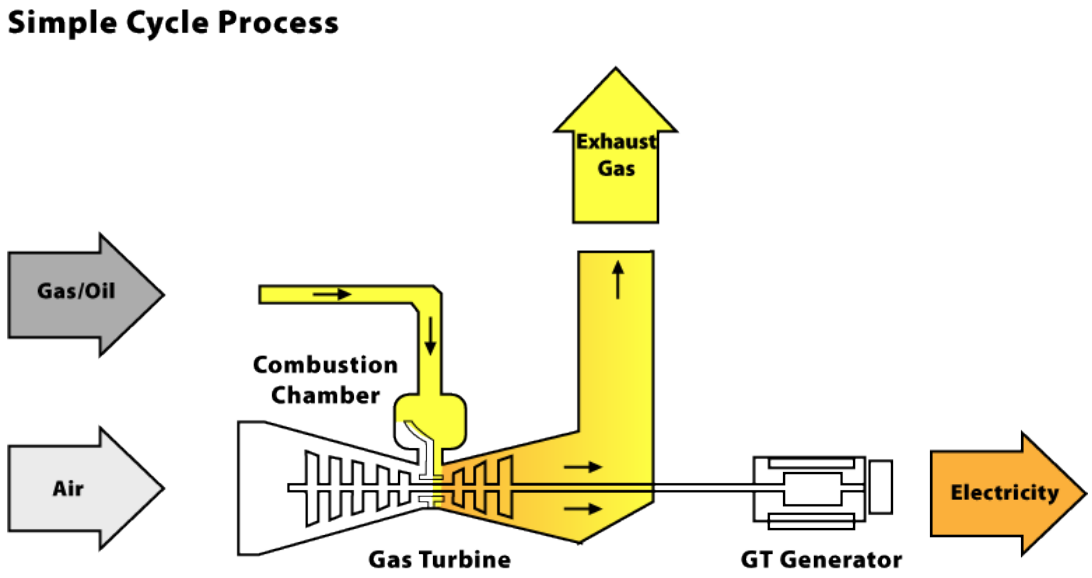

Figure 4-1: Simple Cycle Unit Process Flow Diagram

There are two types of combustion gas turbines: heavy industrial "frame" machines and aero-derivative machines. Gas turbine power plants are pre-assembled at the factory, skid or baseplate mounted, and shipped to the site along with other major components including the generator, cooling, lube oil, and electrical modules. Because they are pre-assembled and modular, field erection hours are significantly reduced, particularly as compared to a coal-fired plant.

The capital cost component of the levelized cost of SCCT power is approximately $47 per Megawatt-hour (MWh) for a plant that runs about 20 percent annual capacity factor. The total levelized cost of SCCT power is projected to be relatively high at approximately $103/MWh for about 1,750 hours of operation in a year or about 20 percent annual capacity factor. If a SCCT were operated at 80 percent annual capacity factor, the levelized cost of power would be about $67/MWh. Most of the power-generation cost for SCCT is from the variable/fuel cost of approximately $48/MWh, assuming the cost of fuel is about $4.00 per million British thermal units (MMBtu). Natural gas costs are highly variable and strongly affected by the economy, production and supply, demand, weather, and storage levels. Weather and demand are large factors that affect gas prices and are very unpredictable. Traditionally, demand for natural gas has peaked in the coldest months, but with the nation's power increasingly being generated by natural gas, demand now also spikes in summer when utilities fire up peaking plants to provide more power for cooling needs.

Permitting of SCCTs has an average timeframe of two to three years. This permitting timeframe is dependent on the type of machine selected and the area where it is constructed. The construction time for

a simple cycle unit is relatively short, ranging from one to 1.5 years. This is of course dependent on availability of units, transmission and construction resources.

SCCT could easily fulfill Basin Electric's peaking power need or local generation need for the Williston Basin area. Natural gas prices are currently low and are projected to remain low for the foreseeable future. With the increased oil (and as a result natural gas) production in North Dakota and Montana, natural gas-fired generation is considered in Basin Electric's future resource portfolios.

Capacity additions could be in one 80- to 100-MW simple-cycle unit or in two smaller units, such as in 45-MW simple-cycle units. The footprint and impacts of these two capacity options would be similar. However, the 45-MW size would allow for better adjustments to variable loads and would operate more efficiently at reduced loads, should that be required. A larger 80 to 100 MW SCCT has an increased likelihood of being operated at half load and, thus, a less efficient operating level. For this reason, Basin chose two 45-MW turbines for its capacity addition.

4.5 Purchase Power/Request for Proposals

Basin Electric developed and issued a Request for Proposals in early 2012 for short- and long-term power supply on its eastern system. The long-term proposals were evaluated against Basin Electric's self-build options. The short-term proposals could be utilized to meet some of Basin Electric's need in the next couple of years. Basin Electric received 5,706 MW of power supply bids. Basin Electric evaluated the short- and long-term proposals and short-listed the total number of qualifying bids to 15, which totaled 1,276 MW.

These short-listed projects details were moved forward into Basin Electric's power supply modeling software, along with Basin Electric's self-build options, and were included in the future resource portfolio modeling runs. If the model indicates one of these options is justified to move forward, Basin Electric would further evaluate that option. However, these short-term proposals would not provide reliability benefits of a location in the McKenzie County-Williston Basin area.

4.6 Summary of Alternatives

Basin Electric needs some quick start and local generation resources in 2014 and 2015 to help with transmission load-serving issues in the Williston Basin area until the 345-kV high voltage transmission line from Antelope Valley Station to Williston to Tioga is completed. The generation types that are capable of meeting Basin Electric's local generation need should be constructed in the area and in the

time frame required to service the increased load. Based on these parameters, a two-unit SCCT at the existing LCS site would be the best alternative and is carried forward as the proposed Project.

4.6.1 No Action Alternative

Under the No Action Alternative, the proposed LCS addition would not be built and the transmission load-serving problems of the Williston Basin-Bakken oil field and McKenzie County in 2014 and 2015 would not be addressed.

4.6.2 Proposed Project

Basin Electric proposes to construct two 45-MW SCCTs at its existing LCS site. The preferred portfolio would include the peaking resources of the two GE LM6000s. By installing similar combustion turbines at the existing LCS site, Basin Electric would benefit from eliminating the additional costs associated with developing a new site, such as land acquisition, pipeline and transmission costs, staffing, and spares. LCS is located within the heart of the Williston Basin and would provide additional reliability benefits during transmission outages, system-wide generation shortfalls and provide for contingency if the load in the Williston Basin-Bakken oil field region grows faster than is currently forecasted.

5.0 AFFECTED ENVIRONMENT

This section provides a description of the existing natural and human resources present in the vicinity of the proposed Project. The regions of influence for terrestrial, aquatic, and socioeconomic resources are defined by natural and cultural boundaries.

The proposed Project is located in the Northwestern Great Plains, Missouri Plateau (43a) Level IV ecoregion (Bryce et al. 1996). This ecoregion extends across much of western North Dakota south of the Missouri River and northwestern South Dakota west of the Missouri River. The portion of this ecoregion located in McKenzie County to the east, south and west of the river breaks of the Yellowstone River, Missouri River, and Tobacco Garden Creek is analyzed in this document. The southern boundary of the area analyzed is the Little Missouri Badlands ecoregion. Patterns of terrestrial natural resources are similar in the Missouri Plateau ecoregion.

The proposed Project is located in the Lower Yellowstone watershed. Lonesome Creek is a tributary to Charbonneau Creek, which in turn confluences with the Yellowstone River to the west; the Charbonneau Creek watershed is the region of influence for analysis of aquatic resources.

The proposed Project is located in central parts of McKenzie County. The region of influence for socioeconomic resources is McKenzie County.

5.1 Air Quality

According to the U.S. Environmental Protection Agency's (EPA) assessment of air quality attainment status (40 CFR Part 81), the proposed Project is in a county that is in attainment for all criteria pollutants (EPA 2012). For most criteria pollutants, the North Dakota Ambient Air Quality Standards are the same as the federal standards; however, North Dakota standards are more stringent for sulfur dioxide. Class I Prevention of Significant Deterioration (PSD) Areas are located 13 miles to the southeast (north unit of Theodore Roosevelt National Park), 25 miles to the south (Elkhorn Ranch Unit of Theodore Roosevelt National Park, 50 miles to the south (south unit of Theodore Roosevelt National Park), 50 miles to the northwest (Medicine Lake National Wildlife Refuge), and 75 miles to the northeast (Lostwood National Wildlife Refuge).

Non-industrial primary pollutants in the area may include particulates (i.e., dust) generated from farming, traffic on unpaved roads, wind erosion, and smoke from burning trash or ground cover. These sources produce pollution that is temporary and intermittent.

5.2 Land Use

The proposed Project site, 2648 NW 140th Avenue, Alexander, North Dakota, is located in central McKenzie County about 14 miles west of Watford City and five miles southeast of Alexander (T150N, R101W, Section 23). The approximate latitude and longitude coordinates are N47°47' W103°35'. The current land use at the Project site is industrial. To the northwest is commercial property between the proposed Project and U.S. Route 85. The surrounding area consists of rural agricultural land used for crops. Oil and gas wells and associated energy development infrastructure is also common. The LCS site was cropland prior to the conversion of land to industrial use for LCS Phase I. A farm is located about one mile to the east on 139th Avenue south of US Route 85 and another farm is located two miles southwest near 141st Avenue. An oil well is located adjacent to the site on the north side. Recreational opportunities in McKenzie County include camping, hiking, biking, swimming, golfing, hunting, fishing and nature observation. Review of state and federal databases indicates that no national wildlife refuges, state wildlife management areas, state game refuges, game management areas, nature preserves, or county parks are present within the LCS area. The closest public land is school trust property with tracts located four miles to the north (T151N, R101W, Section 36), four miles to the northeast (T150N, R100W, Section 16), and four miles to the southwest (T150N, R102W, Section 36). The closest federal land is Little Missouri National Grassland property located seven miles to the west. Theodore Roosevelt National Park is located 13 miles to the southeast. Lake Sakakawea, a federal reservoir used for water supply and recreation, is located 14 miles to the north.

No National Wild and Scenic Rivers or streams on the Nationwide Rivers Inventory (NRI) are located near the site. However, the Little Missouri River through the badlands in McKenzie County is on the NRI list, as is the Missouri River at its confluence with the Yellowstone River near Fort Union Trading Post National Historic Site. The closest reach of the Little Missouri River is 15 miles to the southeast and the Yellowstone-Missouri confluence is 22 miles to the northwest.

LCS is located in Alex Township, which adopted a zoning ordinance in 2011. The Alex Township Zoning Board approved a Conditional Use Permit (CUP) on May 16, 2012, for 48.4 acres for use as an energy conversion facility and adopted a CUP on July 18, 2012, for a transmission line from LCS to the Hay Butte Substation. McKenzie County is in the process of adopting a comprehensive plan and zoning ordinance. However, unless Alex Township elects to relinquish zoning authority to the county, zoning in the study area would continue to be regulated at the township level.

5.3 Geology, Soils, and Farmland

5.3.1 Geology

The Missouri Plateau was not glaciated during the late Pleistocene glaciations which affected the area of North Dakota north and east of the Missouri River. However, occasional erratic boulders from earlier glaciations are present. The landscape consists of level to rolling plains with isolated sandstone buttes. Formations are Tertiary in geologic age, with sandstone, shale and some coal. The geologic formation underlying the Missouri Plateau in McKenzie County is the Sentinel Butte formation (Bluemle 1977). Oil field development associated with the Bakken Formation is ongoing in the area. Lignite resources and salt beds are also present and range from near the surface to as much as 800 feet deep (Carlson 1985).

The proposed Project site is generally flat, with a ground elevation of 2,300 feet above mean sea level (MSL). A prominent hill, Hay Butte, is approximately two miles to the southeast, and Tub Butte and A Butte are approximately four miles to the northwest, near Alexander. The limit of glaciation was south of the proposed Project site, along a line formed by Bennie Peer Creek and the Little Missouri River (Carlson 1985).

5.3.2 Soils

Soils of the Missouri Plateau are primarily Mollisols and Entisols which developed under grassland vegetation. The proposed Project site contains three soil groups (Figure 5-1): Tally-Parshall, Dooley-Zahl, and Vebar-Flasher. The Tally-Parshall fine sandy loams are Mollisols formed in glacial outwash. They are considered farmland of statewide importance. The county as a whole contains 10,946 acres of Talley-Parshall soils of statewide importance, or 0.6 percent of the county. The Dooley-Zahl complex includes Mollisols formed in uplands over glacial till, found on knolls or ridges. Neither the Dooley or Zahl soil series is prime farmland or farmland of statewide importance. The Vebar-Flasher complex, also found on uplands, consists of Mollisols and Entisols. Both the Vebar and Flasher soil series weathered from sandstone, and neither is prime farmland. None of the soils on the LCS site are considered hydric (Aziz, Champa, and VanderBusch 2006).

5.3.3 Farmland

McKenzie County is consistently one of the top ten counties in North Dakota for the production of durum wheat, lentils, sugar beets, and cattle (USDA 2012a). In 2007, McKenzie County had approximately 1,074,700 acres of farmland (roughly 59 percent of the total county area) classified as farmland from 585 farms (USDA 2012b). About 35 percent of the county is cropland or pasture, 30 percent is privately

owned native rangeland, 30 percent is federal land, and 5 percent is other land (Aziz, Champa, and VanderBusch 2006).

Burns & McDonnell SINCE 1898

Figure 5.1
Soils Map
Lonesome Creek Station
Basin Electric Power Cooperative
McKenzie County, ND

Path: R:\Basin\69029_LSC_EAG\S\DataFiles\ArcDocs\Soils.mxd jdringman 8/16/2013

Source: Burns and McDonnel, 2010 Microsoft Corporation and its data suppliers - Bing Aerial Photography, USGS SSURGO Soils

Issued: 8/16/2013

5.4 Water Resources

An intermittent tributary to Lonesome Creek is located south of LCS and drains the area around the proposed Project site. Water resources in McKenzie County consist of aquifers, man-made ponds, the Yellowstone River, the Missouri River and tributaries. These water resources are described below.

5.4.1 Surface Water, Water Supply, and Discharge

No surface water is found on the site. The LCS would have water supplied by the McKenzie County Water Resource District which has lines located in this area. The district obtains its water supply from the Watford City Reservoir and the Western Area Water Supply Project, which sources its water from the Missouri River. Storm water from the existing LCS facility is captured and retained in an on-site pond.

The facility is located in the Lonesome Creek watershed. Lonesome Creek is intermittent, reflecting the semiarid and variable continental climate in western North Dakota. Lonesome Creek is a tributary to Charbonneau Creek, which in turn confluences with the Yellowstone River about eight miles south of the Missouri River. The average annual rainfall in Watford City is 15 inches.

5.4.2 Groundwater

Aquifers underlying McKenzie County are found in rocks of Cretaceous and Tertiary age, from 140 to 1,800 feet deep. The Tertiary aquifers are in the Ludlow and Tongue River formations, while the deeper Cretaceous aquifers are in the basal Hell Creek and Fox Hills formations. There are also deeper aquifers extending to 15,000 feet in depth in older rocks, but they tend to be brackish and not an important resource. Shallow aquifers also exist in sediments along the major streams and rivers, including Charbonneau, Tobacco Garden, and Cherry Creeks as well as the Little Missouri, Yellowstone, and Missouri Rivers. Yields from the aquifers are 100 gpm. Groundwater slowly flows northeast and is recharged from the south (Croft 1985).

5.4.3 Water Quality

Every two years, the states submit a list of impaired waters to the EPA under the Clean Water Act. These are waters where required pollution controls are not sufficient to attain or maintain applicable water quality standards. The 2012 Draft 303(d) List of Impaired Waters (NDDH 2012) identifies two water bodies in McKenzie County as not supporting designated uses. These are Handy Water Creek, in the eastern portion of the county, and Lake Sakakawea, which is the northern border of the county. Handy Water Creek is impaired for fish habitat, likely due to agricultural practices, and Lake Sakakawea is impaired for methyl mercury.

5.4.4 Wetlands and Waters of the U.S.

Western EcoSystems Technology, Inc. (WEST) reviewed National Wetland Inventory (NWI), National Hydrologic Dataset (NHD), and SSURGO soils data for the entire 160-acre property owned by Basin Electric, including the 48.4 acres containing the energy conversion facility. WEST conducted a field review of wetland features on the property on January 27, 2012 (Appendix A). Based on the data review and field survey, no wetlands, waterbodies, or hydric soils were identified. The NWI indicates that the closest wetlands are in Section 22 about one mile to the northwest of the LCS facility, along Lonesome Creek two miles to the north, or along Antelope Creek two miles to the southwest.

5.4.5 Floodplains

Flood Insurance Rate Maps (FIRM) have not been prepared for McKenzie County outside of Alexander and Watford City. However, the pattern of floodplain areas in these cities indicates that floodplains occur along the major streams, such as Lonesome Creek. Because there are no major streams on the site, there are no identified 100-year floodplains on or near the proposed Project site.

5.5 Vegetation

In the Missouri Plateau ecoregion, a mosaic of spring wheat, alfalfa, and grazing land covers land that was formerly shortgrass prairie. Spring wheat is a predominant crop with other acreage in barley, oats, and sunflowers. Native vegetation consists of mixed grasses including blue grama, wheatgrass, needlegrass, and little bluestem. Forbs include prairie sandreed. Lands adjacent to the proposed Project site have been used for cultivated crops in the past, and this use is likely to continue.

5.6 Wildlife

The proposed Project site is already converted to industrial use and does not provide good wildlife habitat. Wildlife found in the area surrounding the site is typical of the northwestern Great Plains. Typical big game species may include white-tailed deer, mule deer, pronghorn, and elk. Bighorn sheep occur in McKenzie County badlands areas to the south of the proposed Project. Typical other mammals include coyote, mountain lion, porcupine, badger, striped skunk, and bobcat. Game birds expected in the area are ring-necked pheasant, gray partridge, sharp-tailed grouse, and wild turkey. The prairie pothole region is north and east of the Missouri River, so waterfowl and shorebirds would not be expected to be common at the proposed Project site; however, species like killdeer often are attracted to graveled areas such as parking lots. Migratory birds in the area are those of the western prairies, including western meadowlark, yellow warbler, black-headed grosbeak, chipping sparrow, grasshopper sparrow, northern oriole, and loggerhead shrike. Resident birds may include horned lark, black-capped chickadee, white-breasted

nuthatch, blue jay, and American crow. Raptors such as red-tailed hawk, American kestrel, prairie falcon, and turkey vulture are likely found in the area.

5.7 Threatened, Endangered and Special Concern Species

According to the U.S. Fish and Wildlife Service (USFWS) letter received on February 1, 2013, McKenzie County may contain suitable habitat for, or have known occurrences of, three federally listed endangered species and one federally listed threatened species. Two of these species, the interior least tern and pallid sturgeon, are associated with large rivers such as the Yellowstone and Missouri Rivers and would not be found at the proposed Project site. Critical habitat for the third species, the piping plover, in McKenzie County is along the Missouri and Yellowstone Rivers and does not include the project site. The proposed Project is located in the migration corridor of the Aransas Wood Buffalo Population of the whooping crane. However, the proposed Project is not located near any wetlands or riparian areas that would be used for feeding or roosting. Additionally, the site has already been disturbed by the construction of Unit 1, and is committed to industrial use making it unsuitable habitat for the whooping crane.

Two candidate species are found in McKenzie County. Both the Sprague's pipit and Dakota skipper are associated with native prairie. Review of aerial photography and land cover maps indicate that no suitable native prairie habitat is present within the area; therefore, Sprague's pipits and the Dakota skipper are unlikely to utilize this area. Federally listed endangered, threatened, or candidate species are listed in Table 5-1. Because there is no suitable habitat for any endangered, threatened, or candidate species in the Project area, RUS made a finding of "no effect," in accordance with Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*), for all federally listed species that may occur in McKenzie County.

Table 5-1: McKenzie County Listed Species

Common Name	Scientific Name	Federal Status	Critical Habitat in McKenzie County
Whooping Crane	*Grus americana*	E	No
Piping Plover	*Charadrius melodus*	T	Yes[1]
Interior Least Tern	*Sterna antillarum*	E	No
Spragues Pipit	*Anthus spragueii*	C	n/a
Pallid Sturgeon	*Scaphirhynchus albus*	E	No
Dakota Skipper	*Hesperia dacotae*	C	n/a

Source: USFWS
[1]Critical habitat in McKenzie County is sparsely vegetated sandbars along the Missouri River.

The USFWS also enforces the Migratory Bird Treaty Act (MBTA), which protects migratory bird populations and their habitats, and the Bald and Golden Eagle Protection Act, which provides for the protection of the bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*), both of which may occur within McKenzie County. Migratory bird habitats generally consist of breeding and foraging habitat. Many migratory waterfowl utilize wetland areas within McKenzie County during the breeding season, while additional species may use agricultural fields and wetland areas for foraging. Bald and golden eagles can occur throughout McKenzie County, but are found more often near food sources and nesting areas. Bald eagles are primarily found in forested areas near large bodies of water such as the Missouri River, Little Missouri River, and Lake Sakakawea. Golden eagles may be found in more rugged, badland areas associated with these rivers.

5.8 Socioeconomics and Community Resources

In order to identify general socioeconomic patterns in the vicinity of the proposed Project site, population growth trends, racial and ethnic characteristics, economic indicators, and employment data were reviewed.

5.8.1 Population Growth Trends

Although the population of McKenzie County declined from 1990 to 2010, this trend is expected to be reversed with the growth of the oil industry. The most recent projections from the state indicate a potential 169 percent increase in population for McKenzie County by 2025. Table 5-2 shows the trends in population change and population projections for North Dakota and McKenzie County.

Table 5-2: Population Trends and Projections

	1990	2000	2010	% Change 2000-2010	2025	% Change 2010-2025
North Dakota	638,800	642,200	672,591	4.7	841,820	25.0
McKenzie County	6,383	5,737	6,360	10.9	17,110	169.0

Source: U.S. Census Bureau, 2000 and 2010 Census; Center for Social Research 2012

5.8.2 Racial and Ethnic Characteristics

The proposed Project site is located within Census Tract 9625. Census tracts are small, relatively permanent statistical subdivisions of a county and the smallest census geography for which the U.S. Census Bureau's 2007-2011 American Community Survey data is available. McKenzie County is mainly rural, with a population that is 76 percent white and 21 percent American Indian. Table 5-3 shows the racial and ethnic composition of the state, county, and local community.

Table 5-3: Racial Characteristics

	Total Population Estimate (2011)	White	American Indian and Alaska Native	Other	Hispanic	Total Minority
North Dakota	683,932	89.8%	5.7%	4.5%	2.2%	11.3%
McKenzie County	6,262	76.0%	21.0%	3.0%	2.3%	25.0%
Census Tract 9625	1,287	99.1%	0.3%	0.6%	0.9%	1.9%

Source: U.S. Census Bureau, 2007-2011 American Community Survey 5-Year Estimates and 2011 American Community Survey 1-Year Estimates

5.8.3 Employment and Income

In 2011, McKenzie County's resident labor force, defined as the population aged 16 and over, was 4,798 individuals, or 76 percent of the total population; 3,080 of these workers were employed, resulting in an annual unemployment rate (for the civilian labor force) of 4.2 percent (U.S Census Bureau 2013). Major industries in McKenzie County include agriculture and education, health care, and social services. Table 5-4 provides the employment characteristics for the state, county, and local community.

Table 5-4: Employment Characteristics

	Total Population (16 yrs. and over)	Employed	2011 Unemployment Rate
North Dakota	550,330	370,830	3.1%
McKenzie County	4,798	3,080	4.2%
Census Tract 9625	1,004	657	2.2%

Source: U.S. Census Bureau, 2007-2011 American Community Survey 5 Year Estimates and 2011 American Community Survey 1-Year Estimates

The unemployment rate and poverty rate in McKenzie County is similar to that of North Dakota as a whole. Census Tract 9625 in western McKenzie County has lower unemployment rates and poverty rates than the county or state as a whole. Table 5-5 shows income and poverty data for the state, county, and local community.

Table 5-5: Income, 2011

	Per Capita Income	Median Household Income	Percent People Below Poverty Level
North Dakota	$28,055	$51,704	12.2%
McKenzie County	$29,890	$53,902	12.0%
Census Tract 9625	$28,300	$57,500	6.3%

Source: U.S. Census Bureau, 2007-2011 American Community Survey 5-year Estimates and 2011 American Community Survey 1-Year Estimates

5.8.4 Environmental Justice

Environmental justice concerns may arise from human health or environmental effects of a project on minority or low-income populations. The need to identify environmental justice issues is stated in Executive Order (EO) 12898, entitled "Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations." The EO states "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." A Presidential Memorandum accompanying the EO directed agencies to incorporate environmental justice concerns into their NEPA processes and practices.

Environmental justice issues are identified by first determining whether minority or low-income populations are present. If so, then disproportionate effects on these populations would be considered. The Council on Environmental Quality (CEQ) guidance states that minority populations should be identified when the percentage of minority residents in the affected area exceeds 50 percent or is meaningfully greater than the percentage of minority residents in the general population (CEQ 1997). If the percentage of minority residents of the population in the area census tract exceeds the county level by more than 10 percent, it is considered to be "meaningfully greater" for the purposes of this analysis. The CEQ guidance also states that the low-income populations should be identified based on poverty thresholds as reported by the U.S. Census Bureau. If the poverty rate for the population of the area census tract exceeds the county poverty rate by more than 10 percent, it is considered to be an area of environmental justice concern for the purposes of this analysis.

Based on this methodology, the proposed Project area, within Census Tract 9625, is not considered to be an area of environmental justice concern. As identified in Table 5-3, the percentage of minority residents in Census Tract 9625 is lower than the percentage for McKenzie County as a whole. As identified in Table 5-5, the poverty rate for the proposed Project area census tract is lower than the county poverty rate. Therefore, the proposed Project area is not considered to be an area of environmental justice concern.

5.9 Aesthetics

The proposed Project site is surrounded by undeveloped land, with a recently developed commercial area to the northwest. There are no designated natural areas in the surrounding area or adjacent to the proposed Project site. The topography is rolling farm and grasslands, with riparian areas along the periphery of nearby streams. Man-made features include existing buildings, homes, and state highways.

5.10 Transportation

The proposed Project site is served by an existing network of paved and gravel roads and is located on the east side of 140th Avenue, one mile south of U.S. Route 85, which is the major traffic artery in western North Dakota.

5.11 Human Health and Safety

The nearest medical facility to the proposed Project site is the McKenzie County Hospital in Watford City, approximately 14 miles to the east. The McKenzie County Sheriff's Department, also located in Watford City, provides public safety. Fire protection is provided by the Alexander Volunteer Fire Department.

Electrical generation and transmission facilities generate electromagnetic fields (EMF). Electric fields are produced by the line voltage and magnetic fields are produced by electric current. 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 (2002). The document indicates that at 50 feet from the centerline of a 115-kV transmission line, the typical electric field is 0.5 kilovolt per meter (kV/m) and the typical magnetic field is 6.5 milligauss (mG). 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.

5.12 Noise

There is a new commercial area approximately one-fourth mile to the northwest of LCS. Most houses are located to the north along U.S. Route 85. Currently, there is community noise from the construction activity, and starting in May 2013, the operation of LCS Unit One. Based on modeling of LCS Phase I in 2012, the sound level at the closest nearby receptor is expected to be 38.0 decibels (dBA) or a 24-hour average sound level (L_{dn}) of 44.4 dBA, noticeably lower than the U.S. Housing and Urban Develoment (HUD) guideline of 65 dBA. This is considered the quiet sound level at the exterior of a residence, and standard housing construction reduces inside noise levels by 10 to 20 dB relative to outside noise levels.

5.13 Cultural Resources

In accordance with Section 106 of the National Historic Preservation Act (36 CFR Section 800), federal agencies are required to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings. There are three properties in McKenzie County listed on the National Register of Historic Places: the Fairview Lift Bridge on Route 200 at the Yellowstone River, the Grassy Butte Post Office in the southern part of the county, and the Sandstone School in Keene. None of these properties are close to the proposed Project. A Class III cultural resource inventory was conducted in 2012 by Metcalf Archaeological Consultants, Inc. (MAC 2012) for the LCS property and transmission line corridor prior to construction of Phase I. Based on the results of the Class III survey, MAC recommended a finding of no historic properties affected. By letter of December 4, 2012, the State Historic Preservation Officer (SHPO) concurred with this determination (Appendix A).

6.0 ENVIRONMENTAL CONSEQUENCES

Two alternatives have been carried forward for assessment; the No Action Alternative and the construction and operation of capacity additions at Lonesome Creek Station (the proposed Project). The No Action alternative serves as the benchmark for alternative comparison, under which the proposed Project would not be constructed.

This section of the EA describes the potential impacts of these two alternatives on air quality, land use, soils, surface and groundwater, water quality, vegetation, wildlife, threatened endangered or rare species, wetlands, floodplains, socioeconomics, aesthetics, transportation, noise, health and safety, and cultural resources. Table 6-1 provides a summary comparison of impacts.

Table 6-1: Summary Comparison of Alternatives and Impacts

Resource	Proposed Project	No Action Alternative
Air Quality	Minimal impacts during construction. Operational impacts are expected to be below the National Ambient Air Quality Standards (NAAQS) standards.	Current operational impacts are in compliance with NAAQS
Greenhouse Gas (GHG) Emissions	Minimal impacts	Minimal impacts
Land Use	No impact	No impact
Geology, Soils and Farmland	No impacts to geology, soils, or farmland on already converted site	No impact
Surface Water	Potential sedimentation from construction would be controlled by storm water pollution prevention measures; minimal impacts from demineralized water discharge to retention basin	Minimal impacts from demineralized process water discharging into the storm water retention basin in accordance with NPDES permit conditions
Groundwater	No impact	No impact
Vegetation	No impact	No impact
Wildlife	No impact	No impact
Threatened and Endangered Species	No impact	No impact
Wetlands	No impact	No impact
Floodplains	No impact	No impact
Socioeconomic and Community Resources	Generally positive from construction and operation employment	No impact
Environmental Justice	No impact	No impact

Resource	Proposed Project	No Action Alternative
Aesthetics	Additional contrast from increase in number of SCCT units; compatible with existing views in the area	No impact
Transportation	Approximately 100 additional vehicle trips per day; 260 truckloads per day during construction	No impact
Human Health and Safety	No impact	No impact
Noise	Noise level at nearest residence 41.6 dBA	No impact
Cultural Resources	No impact	No impact

Both short-term and long-term impacts have been considered; all direct, indirect, and cumulative impacts are included. The CEQ regulations implementing NEPA define cumulative impacts as, "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such action" (40 CFR §1508.7). Cumulative impacts are identified and summarized in more detail in Section 6.14.

6.1 Air Quality

6.1.1 No Action

The No Action Alternative would have no short- or long-term impacts to air because no construction would occur.

6.1.2 Construction and Operation Impacts of the Proposed Project

Construction and operation of LCS Phase II would be subject to applicable state and federal air quality regulations. These regulations would apply to fugitive dust as well as CT emissions. Regulations applicable to the proposed Project are North Dakota Construction and Operating Permit Rules, Title V Operating Permits, PSD review, and New Source Performance Standards (NSPS).

6.1.2.1 Construction

During construction of the proposed Project, small amounts of air pollutants would be temporarily generated. Temporary increases in fugitive dust from ground disturbing activities and combustive emissions from construction equipment would be generated. These construction emissions would be temporary in nature, would fall off rapidly with distance from the proposed construction site, and would

not result in any long-term impacts. Once the construction activities were completed, emissions would subside and ambient air quality would return to pre-construction levels.

During construction, fugitive dust control measures would include, but are not limited to, the following:

- Applications of water
- Paving, chemical stabilization, or watering of roadways after completion of grading
- Reduction in speed on unpaved roadways to 15 miles per hour or less
- Use of sweepers or water trucks to remove mud at points of public street access
- Stabilization of dirt storage piles by chemical binders, tarps, or fencing

6.1.2.2 Operation

Class I PSD national park and wilderness areas are located in the vicinity of the LCS site. To obtain an air permit, major new and modified air emissions sources proposing to locate in Class I areas must:

- Install best available control technology (BACT)
- Analyze all impacts of the proposed source's emissions, together with emissions from "secondary growth" associated with the source, as well as emissions from already existing and permitted sources
- Not violate a NAAQS
- Not have an "adverse impact" on a Class I area as determined by the federal land manager

In addition, all major new and modified sources with the potential to affect the visibility of a "mandatory Class I" area must obtain a new source permit that assures no adverse impact on the Class I area's visibility.

The proposed Project includes new stationary air emission sources: two SCCTs. Each SCCT would be 45 MW in size and fired with natural gas. An 80-foot exhaust stack at each SCCT would release flue gas to the atmosphere after passing through air pollution control devices. After implementation of Phase II, the total LCS capacity for both Phases I and II would be 135 MW.

Based on the LCS air permit application for Phase II, emissions would not violate an air quality standard, but emissions of nitrogen oxides, particulate matter, and greenhouse gas emissions would potentially exceed PSD evaluation levels and would require use of BACT. These emissions are 108 tons per year (tpy) for nitrogen oxides, 64.8 tpy for $PM_{2.5}$, and 660,366 tpy for greenhouse gas emissions measured as carbon dioxide equivalent. Dry low-NOx burners in combination with SCR would control NO_x emissions.

For particulate matter, natural gas firing and combustion controls would be used to limit emissions to 5.0 lb/hr. BACT for GHG emissions would be the efficiencies achievable with a CT. Although CO emissions would be below PSD evaluation levels, the proposed Project would still include an oxidation catalyst system to control CO emissions. The two CTs would operate as allowed under applicable permits and regulations. Operation in compliance with the applicable permit limits would not result in an adverse impact to public health and welfare.

Air dispersion modeling was conducted to determine the impacts of operation of the proposed Project on the Class I national park and wilderness areas near the LCS site. These modeling impacts indicated that there would be insignificant air quality, plume visibility, sulfur and nitrogen deposition, soil and vegetation, air toxic, and carcinogen impacts in the Theodore Roosevelt National Park, Medicine Lake National Wildlife Refuge, and Lostwood National Wildlife Refuge Class I areas. Modeling indicated that the air quality impacts from LCS would not exceed the PSD significant impact levels, NAAQS, or PSD increments in northwestern North Dakota. Therefore, the LCS project would not cause or contribute to adverse ambient air quality impacts. Because this modeling considered cumulative effects of other existing and proposed sources, LCS would not cumulatively contribute to adverse air quality impacts.

GHG emissions of 660,366 tpy (600,000 metric tonnes per year) from LCS would represent a small fraction of one percent of United States emissions of 6,708 Terragrams in 2011. Thus, construction and operation of the LCS would not contribute measurably to global GHG emissions. While global climate change in the 21st century is expected to affect northwestern North Dakota through higher temperatures and higher precipitation (Karl, Melillo, and Peterson 2009), this change is not expected to affect the LCS project or the demand for electricity in the near term, which is primarily driven by Bakken oil field development.

6.2 Land Use

6.2.1 No Action

The No Action Alternative would have no short- or long-term impacts to land use at or in the vicinity of the proposed Project because no construction or changes in land development patterns would occur.

6.2.2 Construction and Operation Impacts of the Proposed Project

Construction and operation of the proposed Project would take place within the same seven-acre property that is now used for Lonesome Creek Station Phase I. An additional 22 acres of the plant site (Figure 2-2) is available for a construction material laydown area. The proposed construction and operation of the

proposed Project would introduce additional traffic on local roadways during the construction period, and these potential impacts are discussed in Section 4.10, Transportation.

6.3 Geology, Soils, and Farmland

6.3.1 No Action

The No Action Alternative would have no short- or long-term impacts to geology, soils or farmland at or in the vicinity of the proposed Project site because no construction would occur.

6.3.2 Construction and Operation Impacts of the Proposed Project

Because all runoff from the site enters the storm water pond, no soil would leave the site. The site where Phase II would be constructed is currently covered with gravel and would be covered with buildings and impermeable surfaces once Phase II is constructed. There would be temporary soil impacts in the 22-acre construction laydown area; however, no new permanent soil impacts would occur because the laydown area would be revegetated after construction. No additional prime or important farmland would be taken out of production due to construction of the proposed Project because the site has already been withdrawn from agricultural use.

6.4 Water Resources

6.4.1 Surface Water, Water Supply, and Discharge

6.4.1.1 No Action

The No Action Alternative would have no short- or long-term impacts to surface waters, water supply, and discharge in the vicinity of the proposed Project because no construction would occur.

6.4.1.2 Construction and Operation Impacts of the Proposed Project

The proposed Project would use 25 gpm for each unit in the summer when in operation. When all three units are in operation, the water demand would be 75 gpm. Water supply would be from the local rural water distribution system, which is sized adequately to handle this level of water use. The water source for McKenzie County Water Resource District is the Watford City Reservoir and the Missouri River.

Before construction activities begin, a Storm Water Pollution Prevention Plan (SWPPP) would be prepared for all construction activities. The SWPPP would describe the best management practices that would be implemented during construction such as: silt fence, inlet protection, straw bale barriers, rip-rap, and erosion control blankets. All proposed sediment and erosion control measures would be installed

prior to initiating soil-disturbing activities including installation of new foundations and piping for fuel and water supply, construction of foundations, buildings, asphalt drives, and concrete pads, cleanup, and revegetation. Existing roads would be used for construction access to the site. Perimeter silt fencing would be installed around the site.

The proposed Project would not result in any impacts to Lonesome Creek. Neither of the two impaired waters in the county, Lake Sakakawea and Handy Water Creek, is close to LCS and all runoff would be diverted to the storm water pond. Thus, the proposed Project would have no effect on the impairment status of these water bodies. Construction and operation of the proposed Project are not anticipated to result in any long-term or short-term impacts to surface waters.

6.4.2 Groundwater

6.4.2.1 No Action

The No Action Alternative would have no short- or long-term impacts to groundwater at or in the vicinity of the proposed Project because no construction or changes in groundwater usage would occur.

6.4.2.2 Construction and Operation Impacts of the Proposed Project

There would be no impacts to groundwater at the site because excavation to the water table would not occur and no groundwater would be withdrawn.

6.4.3 Water Quality

6.4.3.1 No Action

The No Action Alternative would have no short- or long-term impacts to water quality at or in the vicinity of the proposed Project because no construction or changes in water usage would occur.

6.4.3.2 Construction and Operation Impacts of the Proposed Project

The facility would not discharge storm water external to the site. All runoff and spray mist blowdown overflow would be diverted to the storm water pond. As described in Section 6.4.1.2 above, the proposed Project would have no effects to water quality in Lonesome Creek. Sanitary wastewater would be generated as a result of staffing the facility and would be directed to a state-approved mound septic system. Therefore, construction and operation of the proposed Project would not result in any long-term or short-term impacts to water quality.

6.4.4 Wetlands

6.4.4.1 No Action

The No Action Alternative would have no short- or long-term impacts to wetlands within the proposed Project site because construction or operation of the proposed Project would not occur.

6.4.4.2 Construction and Operation Impacts of the Proposed Project

No wetlands or streams are found on the proposed Project site and there would be no off-site drainage. Thus, construction and operation of the proposed Project would have no effects on wetlands or streams.

6.4.5 Floodplains

6.4.5.1 No Action

The No Action Alternative would have no short- or long-term impacts to floodplains because construction or operation of the proposed Project would not occur.

6.4.5.2 Construction and Operation Impacts of the Proposed Project

There would be no effects to floodplains because no floodplains occur at the proposed Project site and because all runoff would be diverted to the storm water pond.

6.5 Vegetation

6.5.1 No Action

The No Action Alternative would have no short- or long-term impacts to the vegetation communities because no construction would occur. The site would likely be maintained as mowed grass within the proposed Project boundaries.

6.5.2 Construction and Operation Impacts of the Proposed Project

Approximately 22 acres of former crop fields would be disturbed for the laydown yard during construction. However, the proposed Project site is part of the property previously purchased and zoned for LCS Phase I and has already been withdrawn from agricultural use. No undisturbed native vegetation exists on the site.

6.6 Wildlife

The vicinity of the proposed Project consists of agricultural fields and provides habitat for wildlife tolerant of those activities in relatively low densities.

6.6.1 No Action

The No Action Alternative would have no effect on wildlife within the proposed Project because no construction would occur. Normal rural disturbances such as agricultural activities would continue to affect wildlife populations in the area.

6.6.2 Construction and Operation Impacts of the Proposed Project

The proposed Project is not anticipated to result in any long-term or permanent impacts to wildlife species. Construction of the proposed Project would take place at the existing LCS Phase 1 site, which has already been disturbed to develop an operational power plant. Noise and human activity that are associated with construction would result in short-term, temporary displacement impacts to wildlife species foraging in the area. The noise and human activity would temporarily deter wildlife species from using the areas in the immediate vicinity of construction; however, following completion of construction, the wildlife species would be expected to return.

Because golden eagles are found in McKenzie County, USFWS recommended a field survey within one mile of the construction site. Basin Electric will implement this survey and will consult with USFWS should nesting golden eagles be observed.

6.7 Threatened and Endangered Species

6.7.1 No Action

The No Action Alternative would have no short- or long-term impacts to state- or federally protected species because construction or operation of the proposed Project would not occur.

6.7.2 Construction and Operation Impacts of the Proposed Project

As indicated in Section 5.7, there is no habitat for endangered or threatened species at the Project site. Therefore, the proposed Project would have no effect on protected species or their critical habitats; nor would the proposed Project result in short- or long-term impacts to protected species or critical habitats that may occur in McKenzie County. Because there is no suitable habitat for any endangered, threatened, or candidate species in the Project area, RUS made a finding of "no effect," in accordance with Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*), for all federally listed species that may occur in McKenzie County. The USFWS has recommended that the proposed Project include a commitment to stop construction should the whooping crane be observed in the area. Basin Electric will implement this commitment.

6.8 Socioeconomics and Community Resources

6.8.1 Employment and Population

6.8.1.1 No Action

The No Action Alternative would not generate permanent or temporary jobs and would not impact local communities because no construction or operation of the proposed Project would occur.

6.8.1.2 Construction and Operation Impacts of the Proposed Project

Construction of the proposed Project could temporarily stimulate additional jobs in the construction trades such as electricians, laborers, and carpenters. Peak construction labor force for LCS Phase II would be approximately 75 employees. The length of employment would range from a few weeks to several months, depending on skill or specialty. The majority of construction contractors and workers would temporarily relocate to the proposed Project area as construction of the proposed Project would require specialized expertise and workforce. A small number of local construction workers could be utilized for more general activities. However, due to the tight labor market in the region and low unemployment rates, it is anticipated that the majority of the construction workforce would come from outside the region. Gas stations, convenience stores, and restaurants in communities such as Watford City could experience increases in business during the construction period in response to activity from construction workers.

The construction workforce required for the proposed Project would have an impact on the availability of temporary housing. Many of the construction workers would seek temporary housing for varying time periods based on their individual roles in the proposed Project. Arrangement for longer-term housing could be established by the construction contractor, with crews rotating in and out as their assignments begin and end. McKenzie County has a very limited supply of temporary housing units available for use by construction workers relocating to the area on a temporary basis. Short-term housing is likely to experience the largest increase in demand due to the transient nature of construction workers and their limited duration in the proposed Project area. Generally, housing options for construction crews would consist of area hotels, existing crew camps, or RV camps.

Two permanent employees are anticipated to staff the combined LCS Phase I and II facility. Because of the low number of personnel required, operation of the proposed Project would not result in a large increase in the number of permanent residents in the communities near the site.

6.8.2 Environmental Justice

As described in Section 5.8.4, the proposed Project site is not considered to be in an area of environmental justice concern. The percentage of minority residents residing in the census tract where the proposed Project site is located is lower compared to the percentage for McKenzie County as a whole, and the poverty rate for the census tract is lower than the county rate.

6.8.2.1 No Action

The No Action Alternative would have no short- or long-term impacts related to environmental justice issues at or in the vicinity of the proposed Project site because no construction or operation of the proposed Project would occur.

6.8.2.2 Construction and Operation Impacts of the Proposed Project

The proposed Project would be located in a rural area with no nearby neighborhoods and relatively few homes and businesses within close proximity to the proposed Project. Adverse human impacts as a result of the proposed Project would include additional noise and traffic impacts during construction, temporary visual impacts during construction, and long-term visual impacts during operation. However, because the site vicinity is not characterized by a high minority or low-income population, no disproportionate impacts would occur to minority or low-income populations as a result of the proposed Project.

6.9 Aesthetics

6.9.1 No Action

The No Action Alternative would not change the aesthetics of the site and would have no short- or long-term impacts on the existing visual environment because no construction or operation of the proposed Project would occur.

6.9.2 Construction and Operation Impacts of the Proposed Project

The proposed Project would add additional visual elements to a power plant site that already exists. While there would be additional visual contrast from a larger-sized power plant, the overall nature of the proposed Project would be compatible with existing views in the area.

6.10 Transportation

6.10.1 No Action

The No Action Alternative would have no short- or long-term impacts to transportation at or near the proposed Project because no construction or operation of the proposed Project would occur.

6.10.2 Construction and Operation Impacts of the Proposed Project

The peak construction labor force for LCS Phase II is would be approximately 75 employees. Two permanent employees are anticipated to staff the combined LCS Phase I and II facility. This construction workforce and associated support services would generate an approximate maximum of 60 additional vehicle trips per day. The equipment and material deliveries would be approximately 260 truckloads per day. Using any combination of federal, state, and county highways and other township roads throughout the proposed Project area, the traffic impacts would be negligible. The traffic volume in and around Watford City has increased significantly with the oil and gas development occurring in the area. Additional vehicles in the area as a result of the proposed Project would be primarily associated with construction and temporary in nature, because only two full-time employees would be on-site during operation. The roadway capacity of any route and level of service to the traveling public would not be substantially impacted.

Truck access to the existing LCS facility is served by U.S. Route 85 and 140th Avenue. Operating permits would be issued by the state, county, or township for over-sized truck movements on the one-mile of 140th Avenue, the county road that provides access to the site.

6.11 Human Health and Safety

6.11.1 No Action

The No Action Alternative would have no short- or long-term impacts to human health and safety at or in the vicinity of the proposed Project because no construction or operation of the proposed Project would occur.

6.11.2 Construction and Operation Impacts of the Proposed Project

As is the case with any construction project, the proposed Project would result in potential health and safety hazards for construction personnel from heavy equipment operation, overhead materials and cranes, and use of construction tools. Construction-related hazards would be effectively mitigated by complying with all applicable Federal and State occupational safety and health standards, applicable National Electrical Safety Code regulations, and utility design and safety standards.

In addition, Basin Electric would develop a Health and Safety Plan to address public and worker safety during the construction and operation of the proposed Project. The Health and Safety Plan would identify requirements for minimum construction or operation distances from residences or businesses, as well as requirements for temporary fencing around staging, excavation, and laydown areas during construction. It

would also include provisions for worker protection as is required under OSHA with emphasis on CFR 1926 – *Safety and Health Regulations for Construction.* During construction, all employees, contractors, and sub-contractors would be required to conform to OSHA safety procedures. Adequate training would be mandatory for all construction workers on site. Heavy equipment would be in compliance with OSHA requirements for safety devices such as back-up warnings, seat belts, and rollover protection. Personal safety equipment such as hard hats, ear and eye protection, and safety boots would be required for all workers on site. Accidents and injuries would be reported to the designated safety officer at each site.

Risk of accidental fire during construction could occur from human activities such as refueling, cigarette smoking, and use of vehicles and construction equipment in dry, grassy areas. The Health and Safety plan would reduce fire-related risks to acceptable levels by imposing restrictions or procedures regarding these activities. A risk of fire would be present during operation of the proposed Project due to the use and storage of fuel and chemicals within the facility. The proposed Project would have a built-in fire suppression system. In addition, implementation of industry-approved design measures for all proposed Project components would ensure that fire-related risks would remain acceptably low.

Construction and operation of the proposed Project would also involve the use and storage of regulated and hazardous materials. During construction, diesel fuel, gasoline, and lubricating oils from heavy equipment and vehicles could be accidentally leaked or spilled. Hydraulic fluid, paints, and solvents would likely be used during the construction phase as well. All used oil generated at the proposed Project site and other potentially hazardous materials (automotive fluids, spray paint cans etc.) at the site would be collected by a licensed/permitted recycler. To reduce the potential for a release of regulated or hazardous materials during the construction phase of the proposed Project, work would be planned and performed in accordance with OSHA standards and protocols addressing the use of potentially hazardous materials and applicable Federal and State environmental regulations. If a hazardous release were to occur, cleanup, management, and disposal of contaminated soils would be conducted according to EPA and State standards. Conformance to these standards and procedures would reduce the potential for significant impacts resulting from the release of hazardous materials during the construction phase.

During plant operation petroleum products would be stored in areas designed for liquid storage. There would also be two 2,000-gallon tanks of anhydrous ammonia for the SCR system. The quantity of anhydrous ammonia stored on site would exceed the threshold planning quantity set forth in EPA's Clean Air Act Section 112(r) regulations (40 CFR Part 68.130), as well as the threshold in the Emergency Planning and Community Planning and Community Right-to-Know Act. Therefore, Basin Electric would develop a Risk Management Program, prepare a Risk Management Plan, submit the Risk Management

Plan to EPA, and coordinate with the state and local emergency planning committees. All construction sites would be managed to prevent harm to the general public. The general public would not be allowed to enter any construction areas associated with the proposed Project. The major risk to the general public would be from increased traffic volume on the roadways near or adjacent to the proposed Project as a result of commuting construction workers and transportation of equipment and materials.

EMF would be strongest directly under the transmission line connection and decrease with increasing distance from the transmission line ROW. As discussed in Section 5.11, the EMF levels 50 feet from a 115-kV transmission line would be below the published guidelines of the International Commission on Non-Ionizing Radiation Protection. There are no residences or businesses closer than 50 feet to the transmission line connection. The proposed Project would not change the transmission line connections; therefore, it would not have any effect related to EMF over the current EMF along the transmission line connection.

6.12 Noise

Nearby residences and businesses are mostly located to the north of the proposed Project (Appendix C). The modeled L_{eq} and L_{dn} sound pressure levels for each of the nearest structures are shown in Table 6-2. The closest structure is one-half mile from LCS. The No Action Alternative and proposed Project results are presented.

Table 6-2: Expected Worst-Case L_{eq} and L_{dn} Sound Levels

Receiver	Sound Pressure Level			
	No Action (LCS Phase I) L_{eq} (dBA)	No Action (LCS Phase I) L_{dn} (dBA)	Proposed Project (LCS Phases I and II) L_{eq} (dBA)	Proposed Project (LCS Phases I and II) L_{dn} (dBA)
Residential (Res) 1	26.5	32.9	29.8	36.3
Res 2	28.0	34.5	32.0	38.4
Res 3	31.8	38.2	35.2	41.6
Res 4	23.5	29.9	28.4	34.8
Res 5	25.0	31.4	28.9	35.3
Res 6	21.9	28.3	25.9	32.3
Commercial (Com) 1	32.3	38.7	35.1	41.5
Com 2	34.9	41.3	37.5	43.9
Com 3	36.3	42.7	39.4	45.8
Com 4	38.0	44.4	40.7	47.1

6.12.1 No Action

Based on modeling of the proposed LCS Phase I in 2012, the sound level at the closest nearby structure (Com 4) is expected to be 38.0 dBA or an L_{dn} sound level of 44.4 dBA, noticeably lower than the HUD guideline of 65 dBA. This is considered the quiet sound level at the exterior of a residence, and standard housing construction reduces inside noise levels by 10 to 20 dB relative to outside noise levels.

6.12.2 Construction and Operation Impacts of the Proposed Project

When Units 2 and 3 are placed into operation (Phase II), the maximum L_{eq} sound level would approach 40.7 dBA at receptor Com 4. This equates to an L_{dn} sound level of 47.1 dBA, which is lower than the HUD guideline of 65 dBA for site acceptability. The combined sound level from operation of Units 1, 2, and 3 (LCS Phases I and II) would still be considered a quiet sound level at the exterior of a residence, and standard housing construction would reduce outside noise levels by 10 to 20 dB inside the structure. Noise levels due to operation of three units are expected to have little or no impact on the closest residences or commercial area.

6.13 Cultural Resources

6.13.1 No Action

The No Action Alternative would have no short- or long-term impacts to cultural resources at or in the vicinity of the proposed Project site because no construction or operation of the proposed Project would occur.

6.13.2 Construction and Operation Impacts of the Proposed Project

Prior to the construction of Phase I, the SHPO determined that no historic properties would be affected by construction of LCS (Appendix A). This finding remains valid for the proposed Project (Phase II).

6.14 Cumulative Effects

This section describes the region of influence (ROI), or the physical area where the effects of the proposed Project would be noticeable. The ROI varies according to the resource assessed. This section also identifies the list of past, present, and reasonably foreseeable future actions (RFFAs) that have affected or may affect the same resources. Using the applicable ROI and list of past, present and RFFAs, this section provides an assessment of cumulative effects for each resource.

6.14.1 Region of Influence

To determine the contribution of the proposed Project to cumulative effects, impacts on each resource are analyzed for a geographic scope that includes a wider area than the footprint of the proposed Project.

For air resources, the area assessed includes a 50-kilometer radius of the proposed Project site used for air quality modeling, as well as the nearby Class I PSD national park and wilderness areas. For aquatic resources, the area assessed is the Charbonneau Creek watershed, which includes Lonesome Creek. For terrestrial resources, the area assessed includes the McKenzie County portion of the Missouri Plateau ecoregion, bounded by river breaks to the north and west and the Little Missouri badlands to the south.

For socioeconomic resources, the area assessed is the commuting distance of 60 miles with an emphasis on McKenzie County. Resources and issues with primarily local impacts from a cumulative standpoint, including environmental justice, land use, infrastructure, transportation, visual, noise, public health and safety, cultural resources, recreation, and waste, are assessed for McKenzie County.

6.14.2 Past, Present, and Reasonably Foreseeable Future Actions

Past, present, and RFFAs that have affected the resources of the McKenzie County area include:

- **Private agricultural management**, which resulted in removal of much native prairie vegetation
- **Bakken Formation oil and gas development**, which has impacted most environmental resources in the county and continues to expand with a network of well pads, roads, storage tanks, and pipelines dotting the landscape
- **Existing and planned pipelines**
  - BakkenLink Pipeline, LLC, would transport oil from receipt points in Alexander, Keene and Watford City in McKenzie County south 132 miles to a rail loading point in Fryburg
  - Bear Den Project of CenterPoint Energy Bakken Crude Services LLC is a system of gathering lines for crude oil from northwestern Dunn and southeastern McKenzie Counties
  - Bear Paw Energy LLC, proposed Garden Creek Gas Plant near Watford City and proposed pipeline would transport the product 64 miles west to Sidney
  - Belle Fourche Pipeline would transport crude oil from Alexander southward to a receipt point in Baker, Montana
  - Bridger Pipeline LLC, Four Bears Pipeline delivers oil from McKenzie and Dunn Counties south to Fryburg
  - Enbridge Pipelines LLC, Sanish Pipeline would transport crude oil 42 miles from Johnsons Corner in eastern McKenzie County north to Tioga in Williams County
  - Hess Hawkeye Pipeline System would transport oil, natural gas, and natural gas liquies from the existing Hawkeye Central Station north to Lake Sakakawea, then northward into Williams County

  - Saddle Butte Pipeline, LLC, proposed High Prairie Pipeline would transport oil from Alexander across northern McKenzie County; receipt points for gathering pipelines are located in Alexander
  - TransCanada Northern Border Pipeline extends northwest to southeast across McKenzie County, including near the proposed Project, receiving gas from a facility in Watford City
  - Williston Basin Interstate Pipeline, a natural gas facility that has lines from Watford City to Williston
- **Electrical distribution line expansions** in the Watford City area by McKenzie County Electric Cooperative
- **Antelope Valley to Neset Transmission Line**, which would cross McKenzie County and is the subject of a draft EIS recently released by RUS
- **U.S. Route 85 improvements from Watford City to Williston**
  - North Dakota Department of Transportation is evaluating proposed truck relief routes or bypasses around Alexander and Watford City
  - Four-lane construction of U.S. Route 85 is proposed from Watford City to Williston, including the portion just north of the Lonesome Creek Station

If oil and gas development were to continue as projected, the Bakken oil field development would likely substantially transform the landscape of the Missouri Plateau.

Air

Emissions of criteria pollutants and greenhouse gases are occurring from oil and gas development, especially where there is methane flaring. Air quality in the region is generally considered good and there are no nearby non-attainment areas in the vicinity of the proposed Project. Construction activities would increase the level of exhaust emissions, fugitive dust, and other construction-related emissions above the current levels. However, these increases are not anticipated to appreciably affect the area's overall air quality, and no cumulative impacts to air quality would occur as a result of construction activities. During operation of the proposed Project, there would be no violations of the NAAQS. The proposed Project, when added to other past, present, and RFFAs, would not contribute to a violation of air quality standards and would not cause adverse cumulative effects to air quality. The proposed Project would not be a noticeable impact on global greenhouse gas emissions.

Land Use

The agricultural landscape of the Missouri Plateau is interrupted by oil and gas well pads that include water tanks and up to 16 wells per pad. In some locations, pads are spaced every four miles. The proposed

Project would be constructed at an existing industrial site and would be consistent with the character of the area, which includes commercial development to the northwest and an oil well pad to the immediate north. Therefore, the proposed Project would not contribute to adverse cumulative land use impacts.

Geology, Soils, and Farmland

Oil and gas development is impacting geology, soils, and farmland across McKenzie County and the Missouri Plateau. The proposed Project would not affect geological resources; therefore, there are no cumulative geological effects. Prime farmland in McKenzie County is being taken out of production in scattered locations by oil well pads. However, these impacts to farmland and farm operations are minimized by the locations of oil well pads along section lines four miles apart, with horizontal drilling between well pads. Construction of the proposed Project would not take any farmland out of production. The previously constructed Phase I involved less than one acre of prime farmland soil of the Tally-Parshall group. This represented a minor contribution to ongoing cumulative effects from farmland loss. This contribution was less than one percent of the prime farmland in McKenzie County.

Surface Water

Fresh water is withdrawn from Lake Sakakawea for use in hydraulic fracturing in McKenzie County. The proposed Project uses a minor amount of rural water. It would have no impact on area surface waters; therefore, it would not contribute to cumulative effects on surface water.

Groundwater

Ongoing cumulative effects include potential aquifer depletion from oil and gas development and private agricultural activities. Disposal of drilling fluids from oil and gas development and salt water disposal from oil and gas operations would be below the level of surface aquifers. The groundwater impacted by oil and gas activities is low quality and not suitable for potable, agricultural, or industrial use, exceeding 10,000 parts per million in total dissolved solids. The proposed Project would have no impact on area groundwater; therefore, it would not contribute to cumulative effects.

Vegetation

Most of the Missouri Plateau is cropland and pasture. There is little native vegetation in the area; most native prairie in the Missouri Plateau has been replaced by agricultural uses. The proposed Project would be developed on a site that no longer includes native vegetation; therefore, the proposed Project would not result in the loss of native vegetation and would not contribute to any cumulative effects.

Wildlife

Mostly common wildlife species inhabit the agricultural lands of the Missouri Plateau, and the oil and gas development presently occurring displaces some individuals. The proposed Project including the laydown area would primarily affect low quality wildlife habitat. It is likely that private agricultural activities would continue in the surrounding area following the construction and operation of the proposed Project. Existing wildlife in the area that are sensitive to noise are likely to be impacted during extensive construction activities, but are likely to return following completion of major construction activities. The proposed Project, when combined with other past, present, and future RFFAs, would not result in adverse cumulative impacts to valuable wildlife habitat.

Threatened and Endangered Species

Oil and gas development has likely affected some habitat, especially at large river crossings and where the development crosses native prairie. Because the proposed Project does not contain any habitat for state- or federally-listed species and would not directly or indirectly impact any sensitive species, the proposed Project would not contribute to cumulative impacts on listed species.

Wetlands

Infrastructure for oil and gas development crosses wetlands but generally does not cause permanent impacts. The proposed Project would not be located in wetlands, there are no wetlands adjacent to the proposed Project site, and the proposed Project would contain all runoff in the storm water pond; therefore, it would not contribute to cumulative effects on wetlands.

Floodplains

Infrastructure for oil and gas development crosses floodplains but generally does not cause obstructions. The proposed Project would not be located in a floodplain or indirectly contribute to floodplain development; therefore, it would not contribute to cumulative effects on floodplains.

Socioeconomic and Community Resources

Oil and gas development requires housing and associated commercial and government services, mostly in surrounding towns like Watford City, Alexander, and Williston. These impacts are occurring in the area now. The construction work force for the proposed Project would also be expected to require temporary housing within a 60-mile commuting radius. The permanent work force of two people would most likely live in the area. These temporary and permanent employment levels would create additional demand for housing and public services, but would not measurably add to the strain already present on existing community facilities. The proposed Project would add generally positive socioeconomic impacts by

contributing to the local economy through jobs and electric infrastructure support, and would not contribute to any negative socioeconomic consequences such as losses of jobs in other industries.

Environmental Justice

No minority or low-income communities are in the vicinity of the proposed Project; therefore, there is no potential for disproportionate impacts to minority and low-income communities. The proposed Project would not contribute to any environmental justice cumulative impacts.

Aesthetics

The rural agricultural landscape of McKenzie County is being changed by the presence of well pads at regular intervals. These have a visual impact because of the generally low relief of the natural landscape and the presence of vertical elements such as water tanks, drilling rigs, and equipment associated with well pads. The proposed Project would add additional structures to an existing power generation unit. Because other industrial features already exist at the site, new visual contrast would be minor. At longer distances, the proposed Project would blend in to the larger landscape and would be a small part of the overall vistas.

Transportation

Oil and gas development has introduced additional truck traffic on local roads and state highways in McKenzie County. Heavy equipment is now being driven down rural roads. This has the potential to cause road damage, especially during spring thaw. The proposed Project would generate some construction traffic; however, because the proposed Project is located less than one mile from U.S. Route 85, it would have limited potential to contribute to damage to the rural road network. The proposed Project would be a minor contribution to truck traffic in the area during construction and would not contribute to truck traffic during operation; contributing negligibly to transportation issues in the area. Furthermore, other RFFAs would include improvements to U.S. Route 85, including a Watford City Truck Reliever Route and an Alexander Bypass, as well as four-lane construction of U.S. Route 85 from Watford City to Williston. These RFFAs would provide truck relief in the area of the proposed Project, further reducing cumulative impacts.

Noise

Oil and gas development is contributing to community noise in rural areas where these higher levels of noise have not been present in the past. Increased truck traffic associated with these developments is contributing to increased traffic noise in both rural and urban locations. The proposed Project would contribute to rural noise levels, mostly during construction. However, there would be no long-term

cumulative noise effects from the proposed Project due to its location one mile off of U.S. Route 85 and its distance from sensitive receptors.

Human Health and Safety

Communities and infrastructure in the McKenzie County area are burdened by existing oil and gas development. Oil rigs, pipelines and wells require additional electricity to run motors and lights and increase demand for housing. New residents and commercial and industrial development require community health and safety services. The proposed Project would have health and safety infrastructure on site to address the facility needs and would not create additional demands that would cause adverse cumulative effects on community health and safety services.

Cultural Resources

Existing agricultural and oil and gas development activities in McKenzie County may have inadvertently affected some cultural sites; however, no specific past and present adverse impacts have been identified. The proposed Project would not impact any National Register-eligible resources. No RFFAs have been identified that would have adverse effects on historic and cultural resources. Future impacts from federally funded or permitted actions would continue to be addressed by Section 106 of the National Historic Preservation Act. As a result, there would be no adverse cumulative effects from the proposed Project.

Table 6-3 summarizes the results of the cumulative effects analysis.

Table 6-3: Summary of Cumulative Impacts Assessment

Resource Area	Region of Influence	Cumulative Impacts	Contribution of Proposed Project to Cumulative Effects
Air	50 km radius	Emissions from oil and gas development; no non-attainment areas nearby; GHG emissions from oil and gas development	Minor; no violation of NAAQS; minor emissions of GHG
Land Use	McKenzie County	Oil and gas development well pads located every four miles in some places; pads include water tanks, up to 16 wells per pad	None
Geology, Soils and Farmland	Missouri Plateau	Prime farmland affected by well pads; impacts minimized by locations along section lines four miles apart and horizontal drilling in between	None

Resource Area	Region of Influence	Cumulative Impacts	Contribution of Proposed Project to Cumulative Effects
Surface Water	Charbonneau Creek watershed	Freshwater withdrawn for hydraulic fracturing from Lake Sakakawea; runoff from extensive oil and gas land disturbances	Minor discharge of water to storm water retention basin
Groundwater	McKenzie County	Aquifer depletion from oil and gas development and private agricultural activities; drilling fluids from oil and gas development; salt water disposal from oil and gas operations	None
Vegetation	Missouri Plateau	Little native vegetation in the area; most native prairie in the Missouri Plateau has been lost	None
Wildlife	Missouri Plateau	Some common wildlife species displaced by agricultural activities and oil and gas development	None
Threatened and Endangered Species	Missouri Plateau	Oil and gas development has likely affected some habitat, especially at stream crossings and where it crosses native prairie	None
Wetlands	Missouri Plateau	Infrastructure for oil and gas development crosses wetlands but generally does not cause obstructions	None
Floodplains	Missouri Plateau	Infrastructure for oil and gas development crosses floodplains but generally does not cause obstructions	None
Socioeconomic and Community Resources	Commuting distance (60 mi); emphasis on McKenzie County	Oil and gas development requires housing and associated commercial and government services, mostly surrounding towns like Watford City, Alexander, and Williston	Minor contribution to generally positive impacts
Environmental Justice	McKenzie County	No disproportionate impacts on minorities and low income populations identified	None
Aesthetics	McKenzie County	Oil and gas development at well pads changes views of generally agricultural landscape	Minor
Transportation	McKenzie County	Heavyweight traffic on rural roads due to oil and gas development	Minor during construction; None during operation
Noise	Immediate site	Oil and gas development—noise from drilling rigs and truck traffic	Minor during construction; none during operation

Resource Area	Region of Influence	Cumulative Impacts	Contribution of Proposed Project to Cumulative Effects
Human Health and Safety	McKenzie County	Oil and gas development requires additional community health and safety infrastructure	Minor
Cultural Resources	Missouri Plateau	No specific adverse effects identified from past actions	None

7.0 PERMITTING AND COMMITMENTS

7.1 Permits

A list of potential permits, approval and authorizing actions for the proposed Project is provided in Table 7-1.

Table 7-1: Federal, State, Local Permits, Approvals, and Authorizing Actions

ISSUING AGENCY	PERMIT/APPROVAL NAME	NATURE OF PERMIT	AUTHORITY
Federal Government			
U.S. Fish and Wildlife Service	Consultation	Consultation on the impacts to federally listed endangered and threatened species	Endangered Species Act, Section 7
State Government			
North Dakota Department of Health, Air Quality Division	Permit to Operate	Air Pollution Control Permit	Clean Air Amendments of 1990 and Article 33-15 of North Dakota Administrative Code
North Dakota Department of Health, Water Quality Division	National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge and Storm Water Pollution Prevention Plan	Authorize storm water discharges; construction storm water discharge; storm water discharge from industrial facilities	Section 402 of the Clean Water Act
North Dakota Public Service Commission	Certificate of Site Compatibility	Approval of the siting of energy facilities	North Dakota Energy Conversion and Transmission Facility Siting Act, Chapter 49-22
North Dakota State Historic Preservation Officer	Consultation	Impacts on cultural resources that are either listed or eligible for listing on the NRHP (consultation completed)	National Historic Preservation Act, Section 106
Local Government			
Alex Township	Special Use Permit/Rezone from agricultural to industrial	Obtain rezoning approval prior to construction (approval obtained)	Township Regulations
Local Emergency Planning Committee	Emergency Response Plan	Chemical accident prevention	Clean Air Act Section 112(r)

7.2 Commitments

Basin Electric would implement the following actions to ensure protection of sensitive environmental resources:

- If a whooping crane is sighted within one mile of the project while it is under construction, all work will cease and the USFWS will be contacted immediately. In coordination with the USFWS, work may resume after the birds leave the area.
- In the first year of construction and operation, a golden eagle nest survey will be conducted within a one-mile radius of the proposed Project between March 1 and May 15; if nests are found, further consultation will be conducted with the USFWS.

8.0 REFERENCES

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APPENDIX A - AGENCY LETTERS AND CORRESPONDENCE

Lonesome Creek Phase II Environmental Assessment

Agency Scoping Letter Responses

Comment Letters Received: as of 5 February 2013

FEDERAL

STATE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
3425 Miriam Avenue
Bismarck, North Dakota 58501

FEB 0 5 2013

Carla Shinn, NEPA Compliance Specialist
Burns & McDonnell
9400 Ward Parkway
Kansas City, Missouri 64114

Re: Scoping for the Proposed Lonesome Creek Natural Gas Turbine, Phase II
In reply, please reference TAILS #2013-CPA-0106

Dear Ms. Shinn:

This is in response to your letter dated December 6, 2012, regarding the proposed construction of two 45-MW simple cycle natural gas turbines (Phase II) and associated infrastructure at the existing Lonesome Creek Station Site (LCS). The project would be constructed by Basin Electric Power Cooperative (Basin Electric) in McKenzie County, North Dakota. The specific project location is:

T. 150 N., R. 103 W., Section 20

The U.S. Fish and Wildlife Service (Service) offers the following comments under the authority of and in accordance with the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703 et seq.), Executive Order 13186 "Responsibilities of Federal Agencies to Protect Migratory Birds", the Endangered Species Act (ESA) (16 U.S.C. 1531 et seq.), the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57), Executive Order 11990 "Protection of Wetlands", Fish and Wildlife Coordination Act (FWCA) (16 U.S.C. 661-667e, as amended), the Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668d, 54 Stat. 250), and the National Environmental Policy Act (NEPA) (Pub. L. 91-190, 42 U.S.C. 4321-4347, January 1, 1970, as amended).

Threatened, Endangered and Candidate Species

To obtain information on Service trust resources including federally threatened, endangered and candidate species and designated critical habitat that may occur in the identified areas, or may be affected by the proposed activities, we recommend you access the North Dakota Ecological Services Field Office website at http://www.fws.gov/northdakotafieldoffice/. You may also access the Service's Information, Planning, and Conservation System (IPaC) website at http://ecos.fws.gov/ipac/.

If a federal agency authorizes, funds, or carries out a proposed action, the responsible federal agency, or its designated agent, is required to evaluate whether the action "may affect" listed species. If the federal agency determines the action "may affect, is likely to adversely affect" listed species, then the federal agency shall request formal section 7 consultation with this office, or work with this office to remove the likely adverse effects before proceeding. If the evaluation shows a "no effect" determination on listed species, further consultation is not necessary.

The responsibility for compliance with the ESA remains with the federal action agency. Therefore, section 7 consultation cannot be completed until the Rural Utilities Service (RUS) has provided the Service with written designation of Burns & McDonnell as its non-federal agent. Until such time as RUS designates a non-federal agent for informal consultation, the following comments should be considered as preliminary, and are to be used to assist with project planning.

Whooping Crane

The Aransas Wood Buffalo Population (AWBP) of the endangered whooping crane (*Grus americana*) is the only self-sustaining migratory population of whooping cranes remaining in the wild. Whooping cranes breed in the wetlands of Wood Buffalo National Park in Alberta and the Northwest Territories of northern Canada, and overwinter on the Texas coast. Whooping cranes in the AWBP annually migrate through North Dakota during their spring and fall migrations.

The proposed project lies within a corridor that includes approximately 95 percent of all reported whooping crane sightings in the State (enclosure). The presence of suitable roosting and feeding habitat for whooping cranes indicate the potential for whooping crane presence in the proposed project area. The Service recommends that if a whooping crane is sighted within one mile of project while it is under construction, that all work cease within one mile of that part of the project and the Service be contacted immediately. In coordination with the Service, work may resume after the bird(s) leave the area. Whooping cranes are unlikely to spend more than a few days in any one spot during migration.

Piping Plover

Piping plovers, a federally threatened species, are known to nest in the proposed project area. In North Dakota, piping plovers begin arriving on their breeding grounds in early to mid-April and are typically gone by September 1. Construction or maintenance activities during this time period may disturb nesting piping plovers. Critical habitat has been designated for the piping plover. Critical habitat can be viewed on the Service website at http://www.fws.gov/northdakotafieldoffice/endspecies/species/piping_plover.htm. Piping plover critical habitat in the project area, if the project is near alkali lakes, consists of sparsely vegetated beaches, salt-encrusted mud flats, and/or gravely salt flats, and adjacent uplands 200 ft. (61 m) above the high water mark of alkali lakes and wetlands (enclosure 1). Piping plover critical habitat in the project area, if the project is near the Missouri River system, consists of sparsely vegetated riverine sandbars and unvegetated shoreline along the Missouri River system. The Service recommends a ½ mile no entry buffer around all designated critical habitat and on wetlands with potential or documented plover nesting during this timeframe. If you are unable to maintain a ½ mile buffer around all piping plover nesting wetlands, the Service recommends that the project proponent provide additional protective measures in these areas to avoid the potential

take of piping plovers.

Least Tern

The breeding season for the interior population of the least tern lasts from May through August. The peak of the nesting season occurs from mid-June to mid-July. Nests are bowl-shaped depressions, about 4" across, on barren, sandy areas. Least terns nest in colonies where the nests can be as close as a few feet apart. In North Dakota, the least tern utilizes sparsely vegetated sandbars on the Missouri and Yellowstone Rivers. Terns forage for small fish in the river and nearby wetlands.

Pallid Sturgeon

The pallid sturgeon is an ancient fish that evolved in turbid, free-flowing, large rivers with braided channels, sandbars and extensive backwater habitats, and was listed in 1990 as an endangered species. Historically, pallid sturgeon were found in the lower 200 miles of the Yellowstone River; the Missouri River from Fort Benton, Montana to St. Louis, Missouri; and in portions of the Mississippi River basin. The species is now found only in fragmented segments of free flowing rivers within the historic range, as well as upstream portions of impoundments.

Candidate Species

The Dakota skipper, Powershiek skipperling, Sprague's pipit, and sage grouse are species that are candidates for listing under the ESA. No legal requirement exists to protect candidate species; however, it is within the spirit of the ESA to consider these species as having significant value and worth protecting. The Service's Candidate Conservation Program provides a means for conserving these species. Early conservation preserves management options, minimizes the cost of recovery, and reduces the potential for restrictive land use policies in the future. Through Candidate Conservation Agreements and Candidate Conservation Agreements with Assurances the Service can work with interested public and private parties to identify threats to candidate species or species at risk. If there is a federal nexus, a federal agency may also request a conference on any proposed action that may affect a proposed or candidate species.

Dakota Skipper

The Dakota skipper (*Hesperia dacotae*), a candidate species, is a small to medium-sized hesperiine butterfly associated with high quality prairie ranging from wet-mesic tallgrass prairie to dry-mesic mixed grass prairie. The first type of habitat is relatively flat and moist native bluestem prairie. Three species of wildflowers are usually present: wood lily (*Lilium philadelphicum*), harebell (*Campanula rotundifolia*), and smooth camas (*Zygadenus elegans*). The second habitat type is upland (dry) prairie that is often on ridges and hillsides. Bluestem grasses and needlegrasses dominate these habitats. On this habitat type, three wildflowers are typically present in high quality sites that are suitable for Dakota skipper: pale purple (*Echinacea pallida*) and upright (*E. angustifolia*) coneflowers and blanketflower (*Gaillardia sp.*). Because of the difficulty of surveying for Dakota skippers and a short survey window, we recommend that the project avoid any impacts to potential Dakota skipper habitat.

Sprague's Pipit

Sprague's pipit (*Anthus spragueii*) was added to the candidate species list in 2010. Candidate species such as the Sprague's pipit are not protected under the ESA. However Sprague's pipit as

a migratory bird is still protected under the MBTA. Sprague's pipits require large patches of grassland habitat for breeding, with preferred grass height between 4-12 in. (10-30 cm). The species prefers to breed in well-drained, open grasslands and avoids grasslands with excessive shrubs. They can be found in lightly to heavily grazed areas. They avoid intrusive human features on the landscape, so the impact of a development can be much larger than the actual footprint of the feature. If Sprague's pipit habitat is present within your proposed project area, the Service requests that you document any steps taken to avoid and minimize disturbance of this habitat, and that you share this information with our office.

Migratory Birds

The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, and transportation, (among other actions) of migratory birds, their eggs, parts, and nests, except when specifically permitted by regulations. While the MBTA has no provision for allowing incidental take, the Service realizes that some birds may be killed during project construction and operation even if all known reasonable and effective measures to protect birds are used. The Service Office of Law Enforcement carries out its mission to protect migratory birds through investigations and enforcement, as well as by fostering relationships with individuals, companies, and agencies that have taken effective steps to avoid take of migratory birds, and by encouraging others to implement measures to avoid take of migratory birds. It is not possible to absolve individuals, companies, or agencies from liability even if they implement bird mortality avoidance or other similar protective measures. However, the Office of Law Enforcement focuses its resources on investigating and prosecuting individuals, companies, and agencies that take migratory birds without identifying and implementing all reasonable, prudent, and effective measures to avoid that take. Individuals, companies, or agencies are encouraged to work closely with Service biologists to identify available protective measures when developing project plans and/or avian protection plans, and to implement those measures prior to/during construction or similar activities.

To the extent practicable, schedule construction for late summer or fall/early winter so as not to disrupt migratory birds during the breeding season, February 1 to July 15 (**note that if least terns (*Sternula antillarum*) and/or piping plovers (*Charadrius melodus*)are present, the breeding season may extend through August 31).** If work is proposed to take place during the breeding season, there may be take of migratory birds, their eggs, or active nests. If project construction cannot avoid the nesting season, the Service suggests that the vegetation within the proposed project area be mowed/cleared outside of the nesting season, in advance of the project initiation to remove potential breeding habitat for nesting migratory birds in the project area. Once cleared, the project area should be maintained in a state that is unsuitable for nesting until the end of the breeding season or until construction is complete. Alternatively, a qualified biologist could be hired to conduct bird/nest surveys within five days prior to the initiation of construction. If active nests are identified, the project proponent should cease construction, maintain a sufficient buffer around active nests to avoid disturbing breeding activities and contact the Service immediately. The Service recommends that Basin Electric implement all practicable measures to avoid all take, such as suspending construction where necessary, and/or maintaining adequate buffers to protect the birds until the young have fledged. The Service

further recommends that if you choose to conduct field surveys for nesting birds with the intent of avoiding take, that you maintain any documentation of the presence of migratory birds, eggs, and active nests, along with information regarding the qualifications of the biologist(s) performing the survey(s), and any avoidance measures implemented at the project site. Should surveys or other available information indicate a potential for take of migratory birds, their eggs, or active nests, the Service requests that you contact this office for further coordination on the extent of the impact and the long-term implications of the intended use of the project on migratory bird populations.

Bald and Golden Eagles

Bald and Golden Eagles are federally-protected under both the BGEPA and the MBTA. The BGEPA prohibits anyone without a permit issued by the Secretary of the Interior from taking bald eagles (*Haliaeetus leucocephalus*) or golden eagles (*Aquila chrysaetos*), including their parts, nests, or eggs. The BGEPA provides criminal and civil penalties for persons who take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald or golden eagle, alive or dead, or any part, nest, or egg thereof. The BGEPA defines take as pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb. "Disturb" means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available: 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior. In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagles return, such alterations agitate or bother an eagle to a degree that injures an eagle or substantially interferes with normal breeding, feeding, or sheltering habits and causes, or is likely to cause, a loss of productivity or nest abandonment.

The Service's overall management objective for golden eagle and bald eagle populations is to ensure no declines in breeding populations of either species. Numerous relatively minor disruptions to eagle behaviors from multiple activities, even if spatially or temporally distributed, may lead to disturbance that would not have resulted from fewer or more carefully sited activities. The accumulation of multiple land development projects or siting of multiple infrastructures that may be hazardous to eagles can cumulatively reduce the availability of alternative sites suitable for breeding, feeding, or sheltering, resulting in a greater than additive risk of take to eagles.

If your proposed activity is anticipated to result in take of bald or golden eagles, you must first apply for, and receive a permit to take prior to the taking. The determination of the likelihood of take will entail identifying the impacts of your proposed activity.

According to the Service's data, there are a documented golden eagle nests in proximity to your proposed activity. There may be additional eagle nests in proximity to the proposed activity.

<u>Recommendations Specific to Bald Eagles</u>

The size and shape of effective buffers vary depending on the topography and other ecological characteristics surrounding the nest site. In open areas where there are little or no forested or topographical buffers, such as in North Dakota, distance alone must often serve as the buffer. To avoid/minimize impacts to nesting bald eagles from construction activities, the Service recommends: (1) keeping a minimum ½-mile buffer between the activity and any bald eagle nest if no landscape buffer exists; (2) keeping a minimum 660-foot buffer and maintaining a landscape buffer or natural areas between the activity and around nest trees; and (3) avoiding activities during the bald eagle breeding season (February 1 – July 15). The buffer areas serve to minimize visual and auditory impacts associated with human activities near nest sites. Ideally, buffers would be large enough to protect existing nest sites and provide for alternative or replacement nest sites. The Service's May 2007, National Bald Eagle Management Guidelines contains detailed information on protecting bald eagles from disturbance due to human activity. The guidelines can be accessed on the Service's website at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Management/BaldEagle/NationalBaldEagleManagementGuidelines.pdf.

Recommendations Specific to Golden Eagles

Information available to the Service regarding all existing and recent breeding territory data indicates that golden eagles may be present in your proposed activity area. Therefore, we recommend that you make every effort to avoid impacts to golden eagles. If activities are planned within a golden eagle territory, an assessment of the potential for take of a golden eagle will need to be made in conjunction with this office. This entails identifying your proposed activities that may occur in a golden eagle breeding territory, and sharing that information with this office.

The Service recommends that surveys be conducted prior to any on-the-ground activities, to determine the extent of any golden eagle breeding territories in the area that may be affected by the proposed activity. The Service recommends that aerial nest surveys (preferably by helicopter) be conducted within a one-mile wide evaluation corridor or buffer to identify any occupied and unoccupied eagle nest sites in proximity to the proposed project area, including any proposed new access roads. Aerial surveys should be conducted between March 1 and May 15, before leaf-out, so that nests are visible, and so their status (active or inactive) can be determined. A nesting territory or inventoried habitat should be designated as unoccupied by golden eagles ONLY after at least two complete aerial surveys in a single breeding season. Aerial surveys should include the following:

1. Due to the ability to hover and facilitate observations of the ground, helicopters are preferred over fixed wing aircraft, although small aircraft may also be used. The Service requests that [project proponent] report any eagle nests found, as well as nests of any other raptors found during the survey. Whenever possible, two observers should be used to conduct the surveys.
2. Observations of any eagle nest sites should be recorded using GPS. The date, location, nest condition, activity status, and habitat should be recorded for each sighting.
3. We request that you share the qualifications of the biologist(s) conducting the survey, method of survey, and results of the survey with the Service.

Alternatively, Basin Electric could conduct ground surveys to identify golden eagle nests within a one-mile wide evaluation corridor or buffer between March 1 and May 15. However, be aware that ground surveys are much less reliable than aerial surveys, even during leaf-off conditions, and typically may miss ¾ of eagle nests present. At least two ground observation periods lasting at least four hours or more are necessary to designate an inventoried habitat or territory as unoccupied as long as all potential nest sites and alternate nests are visible and monitored. If a golden eagle nest is observed, the project proponent should contact the Service for further consultation.

Please note that maintenance of a minimum ½-mile buffer around active nests may not be adequate to ensure avoidance of take of golden eagles. If the project proponent or federal action agency, if applicable, in conjunction with the Service, determines that any level of take is anticipated, including take due to disturbance, you should work with this office to modify your activity to avoid the take, or apply for a take permit and include the following information:

1. Collect and synthesize relevant project and biological data.
2. Document project avoidance and minimization measures.
3. Quantify the anticipated take.
4. Submit an application and furnish all required information.

Terrestrial Habitat Avoidance and Restoration

Construction activities should be conducted in a manner that will avoid/minimize impacts to the existing habitat in the project area. The following recommendations are intended to reduce construction related impacts:

- Make no stream channel alterations or changes in drainage patterns.
- Avoid placement of fill in wetlands.
- Replace unavoidable loss of wetland habitat with functionally equivalent wetlands.
- Install and maintain appropriate erosion control measures to reduce sediment transport to adjacent wetlands and stream channels.
- In replanting native prairie or other grassland habitat, the Service recommends planting a diverse mixture of native cool and warm season grasses and forbs. Recent research has suggested that a more diverse mix, including numerous forb species, is not only ecologically beneficial but is also more weed resistant, allowing for less intensive management and chemical use. In essence, the more species included in a mixture, the higher the probability of providing competition to resist invasion by non-native plants. The seed source should be as local as possible, preferably collected from the nearby native prairie. If seeds and/or plants are obtained commercially, we recommend obtaining seed stock from nurseries within 250 miles of the project area to ensure the particular cultivars are well adapted to the local climate. The Natural Resources Conservation Service (NRCS) compiles a list of vendors in North Dakota that supply conservation seed and plants at http://plant-materials.nrcs.usda.gov/pubs/ndpmcmt8152.pdf. Additional information on native grasses and forbs may be found at the NRCS Bismarck Plant Materials Center website at http://www.plant-materials.nrcs.usda.gov/ndpmc/.

Thank you for the opportunity to comment on this project proposal. If you require further information, please contact Heidi Riddle of my staff at (701) 250-4481 or at the letterhead address, or contact me directly.

Sincerely,

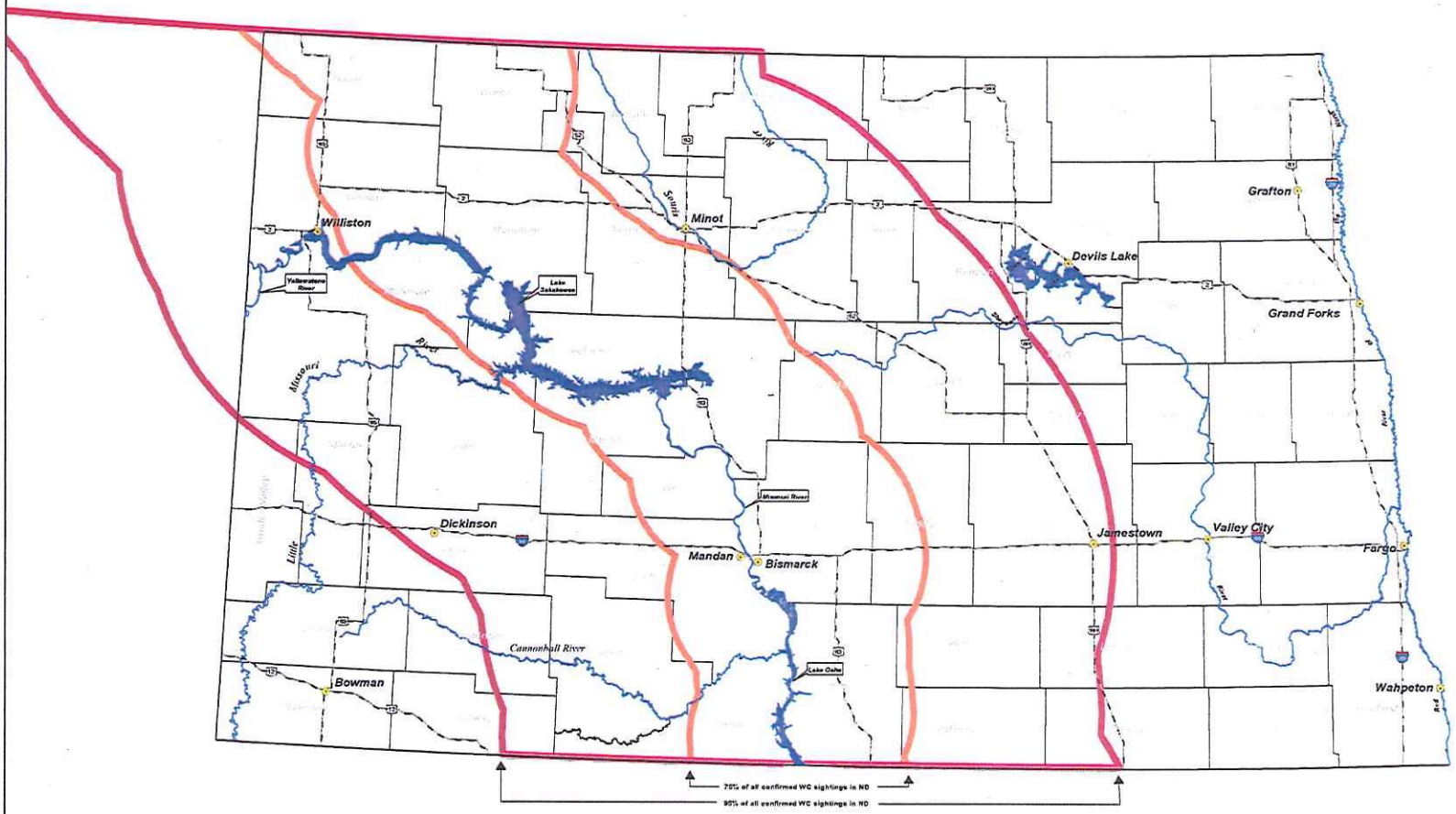
Jeffrey K. Towner

Jeffrey K. Towner
Field Supervisor
North Dakota Field Office

Enclosure

cc: North Dakota Game and Fish Department, Bismarck, ND

North Dakota
Whooping Crane Migration Corridor



DISCLAIMER:

The USFWS makes no claim as to the accuracy or completeness of the displayed information. Species occurrence and habitat information is provided for illustrative purposes only. Federal action agencies and project proponents should contact the USFWS North Dakota Field Office for more detailed species information and technical assistance in evaluating potential project impacts to fish and wildlife resources.

Map produced 04/21/2010 by USFWS Ecological Services, Bismarck, ND.

75% Whooping Crane Migration Corridor

95% Whooping Crane Migration Corridor

0 12.5 25 50 75 100 Miles

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
NORTH DAKOTA REGULATORY OFFICE
1513 SOUTH 12TH STREET
BISMARCK ND 58504-6640

REPLY TO
ATTENTION OF

December 20, 2012

North Dakota Regulatory Office

Ms. Carla Shinn
Burns and McDonnell
9400 Ward Parkway
Kansas City, Missouri 64114-3319

Dear Ms. Shinn:

This is in response to your letter dated December 6, 2012, requesting US Army Corps of Engineers (Corps) comments regarding the proposed construction of two 45-megawatt simple cycle natural gas turbines located in Section 20, Township 150 North, Range 103 West of McKenzie County, North Dakota.

Based on the information contained within your letter, it appears a Department of the Army permit may be required for all or part of your proposed project(s). In order for us to fully evaluate your project(s), please complete and submit the Corps permit application (copy enclosed). Be sure to accurately describe all proposed work and construction methodology. Once the application is complete, please mail it to the letterhead address.

Please be advised, Corps regulatory offices administer Section 10 of the Rivers and Harbors Act (Section 10) and Section 404 of the Clean Water Act (Section 404). Section 10 regulates work impacting navigable waters. Section 10 waters in North Dakota are the Missouri River (including Lake Sakakawea and Lake Oahe), Yellowstone River, James River south of the railroad track in Jamestown, North Dakota, Bois de Sioux River, Red River of the North, and the Upper Des Lacs Lake. Work over, in, or under navigable waters is considered to have an impact. Section 404 of the Clean Water Act regulates the discharge of dredged or fill material (temporarily or permanently) in waters of the United States. Waters of the United States may include, but are not limited to, rivers, streams, ditches, coulees, lakes, ponds, and their adjacent wetlands. Fill material includes, but is not limited to, rock, sand, soil, clay, plastics, construction debris, wood chips, overburden from mines or other excavation activities and materials used to create any structure or infrastructure in waters of the United States.

Do not hesitate to contact this office by letter or telephone (701) 255-0015 if we can be of further assistance.

Sincerely,

Daniel E. Cimarosti
State Program Manager
North Dakota

Enclosure

U.S. ARMY CORPS OF ENGINEERS

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

33 CFR 325. The proponent agency is CECW-CO-R.

OMB APPROVAL NO. 0710-0003
EXPIRES: 28 FEBRUARY 2013

Public reporting for this collection of information is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of the collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters, Executive Services and Communications Directorate, Information Management Division and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)
First - Middle - Last -	First - Middle - Last -
Company -	Company -
E-mail Address -	E-mail Address -
6. APPLICANT'S ADDRESS:	9. AGENT'S ADDRESS:
Address-	Address-
City - State - Zip - Country -	City - State - Zip - Country -
7. APPLICANT'S PHONE NOs. w/AREA CODE	10. AGENTS PHONE NOs. w/AREA CODE
a. Residence b. Business c. Fax	a. Residence b. Business c. Fax

STATEMENT OF AUTHORIZATION

11. I hereby authorize, _____ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

_____ _____
SIGNATURE OF APPLICANT DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)

13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
	Address
15. LOCATION OF PROJECT Latitude: °N Longitude: °W	City - State- Zip-

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)

State Tax Parcel ID Municipality

Section - Township - Range -

17. DIRECTIONS TO THE SITE

18. Nature of Activity (Description of project, include all features)

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres

or

Linear Feet

23. Description of Avoidance, Minimization, and Compensation (see instructions)

24. Is Any Portion of the Work Already Complete? ☐ Yes ☐ No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address-

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT DATE SIGNATURE OF AGENT DATE

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

Instructions for Preparing a
Department of the Army Permit Application

Blocks 1 through 4. To be completed by Corps of Engineers.

Block 5. Applicant's Name. Enter the name and the E-mail address of the responsible party or parties. If the responsible party is an agency, company, corporation, or other organization, indicate the name of the organization and responsible officer and title. If more than one party is associated with the application, please attach a sheet with the necessary information marked Block 5.

Block 6. Address of Applicant. Please provide the full address of the party or parties responsible for the application. If more space is needed, attach an extra sheet of paper marked Block 6.

Block 7. Applicant Telephone Number(s). Please provide the number where you can usually be reached during normal business hours.

Blocks 8 through 11. To be completed, if you choose to have an agent.

Block 8. Authorized Agent's Name and Title. Indicate name of individual or agency, designated by you, to represent you in this process. An agent can be an attorney, builder, contractor, engineer, or any other person or organization. Note: An agent is not required.

Blocks 9 and 10. Agent's Address and Telephone Number. Please provide the complete mailing address of the agent, along with the telephone number where he / she can be reached during normal business hours.

Block 11. Statement of Authorization. To be completed by applicant, if an agent is to be employed.

Block 12. Proposed Project Name or Title. Please provide name identifying the proposed project, e.g., Landmark Plaza, Burned Hills Subdivision, or Edsall Commercial Center.

Block 13. Name of Waterbody. Please provide the name of any stream, lake, marsh, or other waterway to be directly impacted by the activity. If it is a minor (no name) stream, identify the waterbody the minor stream enters.

Block 14. Proposed Project Street Address. If the proposed project is located at a site having a street address (not a box number), please enter it here.

Block 15. Location of Proposed Project. Enter the latitude and longitude of where the proposed project is located. If more space is required, please attach a sheet with the necessary information marked Block 15.

Block 16. Other Location Descriptions. If available, provide the Tax Parcel Identification number of the site, Section, Township, and Range of the site (if known), and / or local Municipality that the site is located in.

Block 17. Directions to the Site. Provide directions to the site from a known location or landmark. Include highway and street numbers as well as names. Also provide distances from known locations and any other information that would assist in locating the site. You may also provide description of the proposed project location, such as lot numbers, tract numbers, or you may choose to locate the proposed project site from a known point (such as the right descending bank of Smith Creek, one mile downstream from the Highway 14 bridge). If a large river or stream, include the river mile of the proposed project site if known

Block 18. Nature of Activity. Describe the overall activity or project. Give appropriate dimensions of structures such as wing walls, dikes (identify the materials to be used in construction, as well as the methods by which the work is to be done), or excavations (length, width, and height). Indicate whether discharge of dredged or fill material is involved. Also, identify any structure to be constructed on a fill, piles, or float-supported platforms.

The written descriptions and illustrations are an important part of the application. Please describe, in detail, what you wish to do. If more space is needed, attach an extra sheet of paper marked Block 18.

Block 19. Proposed Project Purpose. Describe the purpose and need for the proposed project. What will it be used for and why? Also include a brief description of any related activities to be developed as the result of the proposed project. Give the approximate dates you plan to both begin and complete all work.

Block 20. Reasons for Discharge. If the activity involves the discharge of dredged and/or fill material into a wetland or other waterbody, including the temporary placement of material, explain the specific purpose of the placement of the material (such as erosion control).

Block 21. Types of Material Being Discharged and the Amount of Each Type in Cubic Yards. Describe the material to be discharged and amount of each material to be discharged within Corps jurisdiction. Please be sure this description will agree with your illustrations. Discharge material includes: rock, sand, clay, concrete, etc.

Block 22. Surface Areas of Wetlands or Other Waters Filled. Describe the area to be filled at each location. Specifically identify the surface areas, or part thereof, to be filled. Also include the means by which the discharge is to be done (backhoe, dragline, etc.). If dredged material is to be discharged on an upland site, identify the site and the steps to be taken (if necessary) to prevent runoff from the dredged material back into a waterbody. If more space is needed, attach an extra sheet of paper marked Block 22.

Block 23. Description of Avoidance, Minimization, and Compensation. Provide a brief explanation describing how impacts to waters of the United States are being avoided and minimized on the project site. Also provide a brief description of how impacts to waters of the United States will be compensated for, or a brief statement explaining why compensatory mitigation should not be required for those impacts.

Block 24. Is Any Portion of the Work Already Complete? Provide any background on any part of the proposed project already completed. Describe the area already developed, structures completed, any dredged or fill material already discharged, the type of material, volume in cubic yards, acres filled, if a wetland or other waterbody (in acres or square feet). If the work was done under an existing Corps permit, identity the authorization, if possible.

Block 25. Names and Addresses of Adjoining Property Owners, Lessees, etc., Whose Property Adjoins the Project Site. List complete names and full mailing addresses of the adjacent property owners (public and private) lessees, etc., whose property adjoins the waterbody or aquatic site where the work is being proposed so that they may be notified of the proposed activity (usually by public notice). If more space is needed, attach an extra sheet of paper marked Block 24.

Information regarding adjacent landowners is usually available through the office of the tax assessor in the county or counties where the project is to be developed.

Block 26. Information about Approvals or Denials by Other Agencies. You may need the approval of other federal, state, or local agencies for your project. Identify any applications you have submitted and the status, if any (approved or denied) of each application. You need not have obtained all other permits before applying for a Corps permit.

Block 27. Signature of Applicant or Agent. The application must be signed by the owner or other authorized party (agent). This signature shall be an affirmation that the party applying for the permit possesses the requisite property rights to undertake the activity applied for (including compliance with special conditions, mitigation, etc.).

DRAWINGS AND ILLUSTRATIONS

General Information.

Three types of illustrations are needed to properly depict the work to be undertaken. These illustrations or drawings are identified as a Vicinity Map, a Plan View or a Typical Cross-Section Map. Identify each illustration with a figure or attachment number.

Please submit one original, or good quality copy, of all drawings on 8½ x11 inch plain white paper (electronic media may be substituted). Use the fewest number of sheets necessary for your drawings or illustrations.

Each illustration should identify the project, the applicant, and the type of illustration (vicinity map, plan view, or cross-section). **While illustrations need not be professional (many small, private project illustrations are prepared by hand), they should be clear, accurate, and contain all necessary information.**

Vicinity Map

The vicinity map you provide will be printed in any public notice that is issued and used by the Corps of Engineers and other reviewing agencies to locate the site of the proposed activity. You may use an existing road map or US Geological Survey topographic (scale 1:24,000) as the vicinity map. Please include sufficient details to simplify locating the site from both the waterbody and from land. Identify the source of the map or chart from which the vicinity map was taken and, if not already shown, add the following:

- location of activity site (draw an arrow showing the exact location of the site on the map).
- latitude, longitude, river mile, if known, and/or other information that coincides with Block 6 on the application form.
- name of waterbody and the name of the larger creek, river, by, etc., that the waterbody is immediately tributary to.
- names, descriptions and location of landmarks.
- name of all applicable political (county, parish, borough, town, city, etc.) jurisdictions
- name of and distance to nearest town, community, or other identifying locations
- names or numbers of all roads in the vicinity of the site.
- north arrow.
- scale.

Plan View

The plan view shows the proposed activity as if you were looking straight down on it from above. your plan view should clearly show the following:

- Name of waterbody (river, creek, lake, wetland, etc.) and river mile (if known) at location of activity.
- Existing shorelines.
- Mean high and mean low water lines and maximum (spring) high tide line in tidal areas.
- Ordinary high water line and ordinary low water line if the proposed activity is located on a non-tidal waterbody.
- Average water depths around the activity.
- Dimensions of the activity and distance it extends from the high water line into the water.
- Distances to nearby Federal projects, if applicable.
- Distance between proposed activity and navigation channel, where applicable.
- Location of structures, if any, in navigable waters immediately adjacent to the proposed activity.
- Location of any wetlands (marshes, swamps, tidal flats, etc.)
- North arrow.
- Scale.
- If dredged material is involved, you must describe the type of material, number of cubic yards, method of handling, and the location of fill and spoil disposal area. The drawing should show proposed retention levees, weirs, and/or other means for retaining hydraulically placed materials.
- Mark the drawing to indicate previously completed portions of the activity.

Cross Section View and/or Elevation

The elevation and/or cross section view is a scale drawing that shows the side, front, or rear of the proposed activity. If a section view is shown, it represents the proposed structure as it would appear if cut internally for display. Your elevation should clearly show the following:

- Water elevations as shown in the plan view.

- Water depth at water-ward face of proposed activity or, if dredging is proposed, dredging and estimated disposal grades.
- Dimensions from mean high water line (in tidal waters) of proposed fill or float, or high tide line for pile supported platform. Describe any structures to be built on the platform.
- Cross section of excavation or fill, including approximate side slopes.
- Graphic or numerical scale.
- Principal dimensions of the activity

Notes on Drawings*

- Names of adjacent property owners who may be affected. Complete names and addresses should be shown in Block 5 on ENG Form 4345.
- Legal property description: Number, name of subdivision, block, and lot number. Section, Township, and Range (if applicable) from plot, deed, or tax assessment.
- Photographs of the site of the proposed activity are not required; however, pictures are helpful and may be submitted as part of any application.
- **While illustrations need not be professional (many small, private project illustrations are prepared by hand), they should be clear, accurate, and contain all necessary information.**

* Drawings should be as clear and simple as possible (ie, not too "busy").

United States Department of the Interior

BUREAU OF INDIAN AFFAIRS
Great Plains Regional Office
115 Fourth Avenue S.E., Suite 400
Aberdeen, South Dakota 57401

IN REPLY REFER TO:
DESCRM
MC-208

DEC 19 2012

Carla Shinn
NEPA Compliance Specialist
Burns & McDonnell
9400 Ward Parkway
Kansas City, Missouri 64114-3319

Dear Ms. Shinn:

We received your letter regarding the proposed two 45-megawat (MW) simple cycle natural gas turbines (Phase II) and associated infrastructure at the existing Lonesome Creek Station Site (LCS) in McKenzie County, North Dakota. We have considered the potential for both environmental damage and impacts to archaeological and Native American religious sites on lands held in trust by the Bureau of Indian Affairs, Great Plains Region. You should be aware, however, that Tribes or Tribal members may have lands in fee status near the site of interest. These lands would not necessarily be in our databases, and the Tribes should be contacted directly to ensure all concerns are recognized. The action considered has the following notification date and project location:

- December 6, 2012 Re: Environmental Assessment-Request for Resource Information and Issue Identification for the Proposed Lonesome Creek Phase II.

We have no environmental objections to this action as long as the project complies with all pertinent laws and regulations. Questions regarding environmental opinions and conditions can be addressed to Jeffrey Davis, Environmental Protection Specialist, at (605) 226-7656.

We also find that the listed action will not affect cultural resources on Tribal or individual landholdings for which we are responsible. Methodologies for the treatment of cultural resources now known or yet to be discovered – particularly human remains – must nevertheless utilize the best available science in accordance with provisions of the Native American Graves Protection and Repatriation Act, the Archaeological Resources Protection Act of 1979 (as amended), and all other pertinent legislation and implementing regulations. Archaeological concerns can be addressed to Dr. Carson N. Murdy, Regional Archaeologist, at (605) 226-7656.

Sincerely,

Acting

Deputy Regional Director – Indian Services

From: Anderson.Carol@epamail.epa.gov
To: Shinn, Carla
Subject: Proposed Lonsome Creek Phase II EA
Date: Thursday, January 03, 2013 4:12:26 PM

Hi Carla,

See below for my contact information. The current Director of the NEPA Compliance and Review Program is Suzanne J. Bohan. As I told you, we will not be submitting scoping comments but would like to be on the distribution list for the EA.

Thanks,

Carol

Carol M. Anderson
NEPA Compliance and Review Program
US Environmental Protection Agency, Region 8
EPR/N
1595 Wynkoop Street
Denver, CO 80202-1129
303-312-6058
anderson.carol@epa.gov

USDA United States Department of Agriculture | Forest Service | Dakota Prairie Grasslands | 240 W. Century Ave. Bismarck, ND 58503

File Code: 2820
Date: January 3, 2013

Burns & McDonnell
Attn: Carla Shinn
NEPA Compliance Specialist
9400 Ward Parkway
Kansas City, MO 64114

Dear Ms. Shinn:

This letter is in response to your letter dated December 6, 2012 regarding the Environmental Assessment – Request for Resource Information and Issue Identification for the Proposed Lonesome Creek Phase II project.

There are no National Forest System lands on or near the existing Lonesome Creek Station Site located in the Alex Township of McKenzie County in the SW ¼ of Section 20; T150N; R103W; approximately fourteen miles west of Watford City, North Dakota; therefore, we do not have any issues about this project. Thank you for coordinating this information with us.

Sincerely,

DENNIS D. NEITZKE
Grasslands Supervisor

cc: Mr. Chris Miller, Basin Electric
Mr. Jeff Ingalls, McKenzie Ranger District
Mrs. Karen Dunlap, Bismarck Supervisor Office

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
PO Box 1458
Bismarck, ND 58502-1458

December 18, 2012

Burns & McDonnell
9400 Ward Parkway
Kansas City, Missouri 64114-3319

RE: Environmental Assessment – Request for Resource Information and Issue Identification For the Proposed Lonesome Creek Phase II

Dear Sirs:

The Natural Resources Conservation Service (NRCS) has reviewed your letter dated December 6, 2012, concerning construction of two 45-megawatt (MW) simple cycle natural gas turbines and associated infrastructure at the existing Lonesome Creek Station Site (LCS).

NRCS has a major responsibility with the Farmland Protection Policy Act (FPPA) in documenting conversion of farmland (i.e., prime, statewide importance and local importance) to non agriculture use. Your proposed project consists of installing underground pipe which does not remove farmland from permanent production, therefore; FPPA does not apply to these activities. If the project includes the addition of permanent sites, such as pumping stations, FPPA may apply, and the Form AD-1006 must be completed. Water storage facilities are exempt. Below are instructions for completing the Farmland Conversion Impact Rating form.

Farmland

For those areas subject to FPPA, the following form must be completed. Enclosed is a Farmland Conversion Impact Rating Form AD-1006 or you may utilize a fillible web based form at http://www.nrcs.usda.gov/Programs/fppa/pdf_files/AD1006.PDF to record the following. If applicable, you may email the above information to Dustin Brodina, Acting Resource Conservationist, at dustin.brodina@nd.usda.gov . You will need to complete Part I and Part III. We will also need a map of the site at an appropriate scale so we can accurately assess the area (e.g., 1:20,000 or 1:24,000). If the farmland (i.e., prime, statewide importance and local importance) is determined to be subject to the FPPA, we will then complete Parts II and IV. NRCS will measure the relative value of the site as farmland on a scale of 0 to 100 according to the information sources listed in CFR 658.5(a). If FPPA applies to this site, Form AD-1006 will be returned to you for completion of Part VI, Site Assessment Criteria.

Wetlands

The Wetland Conservation Provisions of the 1985 Food Security Act, as amended, provides that if a USDA participant converts a wetland for the purpose or to have the effect of making agricultural production possible, loss of USDA benefits could occur. The Natural Resource Conservation Service has developed the following guidelines to help avoid impacts to wetlands and possible loss of USDA benefits for producers. If these guidelines are followed, the impacts to the wetland will be considered minimal allowing USDA participants to continue to receive USDA benefits. Following are the requirements:

- Disturbance to the wetland must be temporary.
- No drainage of wetland is allowed (temporary or permanent).
- Mechanized landscaping necessary for installation is kept to a minimum and preconstruction contours are maintained.
- Temporary side cast material must be placed in such a manner not to be dispersed in the wetland.
- All trenches in a wetland must be backfilled to the original elevation.

NRCS would recommend that impacts to wetland be avoided. If the alignment of the project requires passage through a wetland, NRCS can complete a certified wetland determination, if requested, by the landowner/operator

If you have additional questions pertaining to FPPA, please contact Steve Sieler, Liaison Soil Scientist, NRCS, Bismarck, ND at 701-530-2019.

Sincerely,

WADE D. BOTT
State Soil Scientist

Enc.

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request
Name Of Project	Federal Agency Involved
Proposed Land Use	County And State
PART II *(To be completed by NRCS)*	Date Request Received By NRCS

Does the site contain prime, unique, statewide or local important farmland? *(If no, the FPPA does not apply -- do not complete additional parts of this form).*	Yes ☐	No ☐	Acres Irrigated	Average Farm Size

Major Crop(s)	Farmable Land In Govt. Jurisdiction Acres: %	Amount Of Farmland As Defined in FPPA Acres: %
Name Of Land Evaluation System Used	Name Of Local Site Assessment System	Date Land Evaluation Returned By NRCS

PART III *(To be completed by Federal Agency)*	Alternative Site Rating Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly				
B. Total Acres To Be Converted Indirectly				
C. Total Acres In Site	0.0	0.0	0.0	0.0
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland				
B. Total Acres Statewide And Local Important Farmland				
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value				
PART V *(To be completed by NRCS)* Land Evaluation Criterion Relative Value Of Farmland To Be Converted *(Scale of 0 to 100 Points)*	0	0	0	0

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(These criteria are explained in 7 CFR 658.5(b)*	Maximum Points				
1. Area In Nonurban Use					
2. Perimeter In Nonurban Use					
3. Percent Of Site Being Farmed					
4. Protection Provided By State And Local Government					
5. Distance From Urban Builtup Area					
6. Distance To Urban Support Services					
7. Size Of Present Farm Unit Compared To Average					
8. Creation Of Nonfarmable Farmland					
9. Availability Of Farm Support Services					
10. On-Farm Investments					
11. Effects Of Conversion On Farm Support Services					
12. Compatibility With Existing Agricultural Use					
TOTAL SITE ASSESSMENT POINTS	160	0	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	0	0	0	0
Total Site Assessment *(From Part VI above or a local site assessment)*	160	0	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	0	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? Yes ☐ No ☐

Reason For Selection:

(See Instructions on reverse side)

Form AD-1006 (10-83)

This form was electronically produced by National Production Services Staff

STEPS IN THE PROCESSING THE FARMLAND AND CONVERSION IMPACT RATING FORM

Step 1 – Federal agencies involved in proposed projects that may convert farmland, as defined in the Farmland Protection Policy Act (FPPA) to nonagricultural uses, will initially complete Parts I and III of the form.

Step 2 – Originator will send copies A, B and C together with maps indicating locations of site(s), to the Natural Resources Conservation Service (NRCS) local field office and retain copy D for their files. (Note: NRCS has a field office in most counties in the U.S. The field office is usually located in the county seat. A list of field office locations are available from the NRCS State Conservationist in each state).

Step 3 – NRCS will, within 45 calendar days after receipt of form, make a determination as to whether the site(s) of the proposed project contains prime, unique, statewide or local important farmland.

Step '4 – In cases where farmland covered by the FPPA will be converted by the proposed project, NRCS field offices will complete Parts II, IV and V of the form.

Step 5 – NRCS will return copy A and B of the form to the Federal agency involved in the project. (Copy C will be retained for NRCS records).

Step 6 – The Federal agency involved in the proposed project will complete Parts VI and VII of the form.

Step 7 – The Federal agency involved in the proposed project will make a determination as to whether the proposed conversion is consistent with the FPPA and the agency's internal policies.

INSTRUCTIONS FOR COMPLETING THE FARMLAND CONVERSION IMPACT RATING FORM

Part I: In completing the "County And State" questions list all the local governments that are responsible for local land controls where site(s) are to be evaluated.

Part III: In completing item B (Total Acres To Be Converted Indirectly), include the following:

1. Acres not being directly converted but that would no longer be capable of being farmed after the conversion, because the conversion would restrict access to them.

2. Acres planned to receive services from an infrastructure project as indicated in the project justification (e.g. highways, utilities) that will cause a direct conversion.

Part VI: Do not complete Part VI if a local site assessment is used.

Assign the maximum points for each site assessment criterion as shown in § 658.5 (b) of CFR. In cases of corridor-type projects such as transportation, powerline and flood control, criteria #5 and #6 will not apply and will, be weighed zero, however, criterion #8 will be weighed a maximum of 25 points, and criterion #11 a maximum of 25 points.

Individual Federal agencies at the national level, may assign relative weights among the 12 site assessment criteria other than those shown in the FPPA rule. In all cases where other weights are assigned relative adjustments must be made to maintain the maximum total weight points at 160.

In rating alternative sites, Federal agencies shall consider each of the criteria and assign points within the limits established in the FPPA rule. Sites most suitable for protection under these criteria will receive the highest total scores, and sites least suitable, the lowest scores.

Part VII: In computing the "Total Site Assessment Points" where a State or local site assessment is used and the total maximum number of points is other than 160, adjust the site assessment points to a base of 160. Example: if the Site Assessment maximum is 200 points, and alternative Site "A" is rated 180 points:

$$\frac{\text{Total points assigned Site A}}{\text{Maximum points possible}} = \frac{180}{200} \times 160 = 144 \text{ points for Site "A."}$$

NORTH DAKOTA
DEPARTMENT *of* HEALTH

ENVIRONMENTAL HEALTH SECTION
Gold Seal Center, 918 E. Divide Ave.
Bismarck, ND 58501-1947
701.328.5200 (fax)
www.ndhealth.gov

December 17, 2012

Ms. Carla Shinn
NEPA Compliance Specialist
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114-3319

Re: Basin Electric's Proposed Lonesome Creek Phase II
McKenzie County, North Dakota

Dear Ms. Shinn:

This department has reviewed the information concerning the above-referenced project submitted under date of December 6, 2012, with respect to possible environmental impacts.

This department believes that environmental impacts from the proposed construction will be minor and can be controlled by proper construction methods. With respect to construction, we have the following comments:

1. All necessary measures must be taken to minimize fugitive dust emissions created during construction activities. Any complaints that may arise are to be dealt with in an efficient and effective manner.

2. Care is to be taken during construction activity near any water of the state to minimize adverse effects on a water body. This includes minimal disturbance of stream beds and banks to prevent excess siltation, and the replacement and revegetation of any disturbed area as soon as possible after work has been completed. Caution must also be taken to prevent spills of oil and grease that may reach the receiving water from equipment maintenance, and/or the handling of fuels on the site. Guidelines for minimizing degradation to waterways during construction are attached.

3. Projects disturbing one or more acres are required to have a permit to discharge storm water runoff until the site is stabilized by the reestablishment of vegetation or other permanent cover. A new facility also may be required to obtain a permit to discharge storm water runoff from industrial activity. Further information on the storm water permits may be obtained from the Department's website or by calling the Division of Water Quality (701-328-5210).

   Cities or counties may impose additional requirements and/or specific best management practices for construction affecting their storm drainage system and may require provisions to address the quality of post-construction storm water runoff from new development and

redevelopment projects. Check with the local officials to be sure any local storm water management considerations are addressed.

4. Noise from construction activities may have adverse effects on persons who live near the construction area. Noise levels can be minimized by ensuring that construction equipment is equipped with a recommended muffler in good working order. Noise effects can also be minimized by ensuring that construction activities are not conducted during early morning or late evening hours.

5. The proposed project appears to have the potential to be a source of emissions to the air capable of causing or contributing to air pollution and may be required to have an Air Pollution Control Permit to Construct/Operate as required by Chapter 33-15-14 of the North Dakota Air Pollution Control Rules. The applicant should contact the Department's Air Pollution Control Program at 701-328-5188 prior to commencing construction.

The department owns no land in or adjacent to the proposed improvements, nor does it have any projects scheduled in the area.

These comments are based on the information provided about the project in the above-referenced submittal. The U.S. Army Corps of Engineers may require a water quality certification from this department for the project if the project is subject to their Section 404 permitting process. Any additional information which may be required by the U.S. Army Corps of Engineers under the process will be considered by this department in our determination regarding the issuance of such a certification.

If you have any questions regarding our comments, please feel free to contact this office.

Sincerely,

L. David Glatt, P.E., Chief
Environmental Health Section

LDG:cc
Attach.

NORTH DAKOTA
DEPARTMENT of HEALTH

ENVIRONMENTAL HEALTH SECTION
Gold Seal Center, 918 E. Divide Ave.
Bismarck, ND 58501-1947
701.328.5200 (fax)
www.ndhealth.gov

Construction and Environmental Disturbance Requirements

These represent the minimum requirements of the North Dakota Department of Health. They ensure that minimal environmental degradation occurs as a result of construction or related work which has the potential to affect the waters of the State of North Dakota. All projects will be designed and implemented to restrict the losses or disturbances of soil, vegetative cover, and pollutants (chemical or biological) from a site.

Soils

Prevent the erosion of exposed soil surfaces and trapping sediments being transported. Examples include, but are not restricted to, sediment dams or berms, diversion dikes, hay bales as erosion checks, riprap, mesh or burlap blankets to hold soil during construction, and immediately establishing vegetative cover on disturbed areas after construction is completed. Fragile and sensitive areas such as wetlands, riparian zones, delicate flora, or land resources will be protected against compaction, vegetation loss, and unnecessary damage.

Surface Waters

All construction which directly or indirectly impacts aquatic systems will be managed to minimize impacts. All attempts will be made to prevent the contamination of water at construction sites from fuel spillage, lubricants, and chemicals, by following safe storage and handling procedures. Stream bank and stream bed disturbances will be controlled to minimize and/or prevent silt movement, nutrient upsurges, plant dislocation, and any physical, chemical, or biological disruption. The use of pesticides or herbicides in or near these systems is forbidden without approval from this Department.

Fill Material

Any fill material placed below the high water mark must be free of top soils, decomposable materials, and persistent synthetic organic compounds (in toxic concentrations). This includes, but is not limited to, asphalt, tires, treated lumber, and construction debris. The Department may require testing of fill materials. All temporary fills must be removed. Debris and solid wastes will be removed from the site and the impacted areas restored as nearly as possible to the original condition.

North Dakota Department of Transportation

Grant Levi, P.E.
Interim Director

Jack Dalrymple
Governor

December 31, 2012

Carla Shinn
NEPA Compliance Specialist
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114-3319

EA REQUEST FOR RESOURCE INFORMATION AND ISSUE IDENTIFICATION FOR THE PROPOSED LONESOME CREEK, PHASE II, MCKENZIE COUNTY, NORTH DAKOTA

We have reviewed your December 6, 2012, letter.

This project should have no adverse effect on the North Dakota Department of Transportation highways.

However, if because of this project any work needs to be done on highway right of way, appropriate permits and risk management documents will need to be obtained from the Department of Transportation District Engineer, Walter Peterson at 701-774-2700.

Robert Fode

ROBERT A. FODE, P.E., DIRECTOR - OFFICE OF PROJECT DEVELOPMENT

57\raf\js
c: Walter A. Peterson, Williston District

NORTH DAKOTA FOREST SERVICE

"Enhancing the Quality of Life Through Forestry"

December 27, 2012

Carla Shinn, NEPA Compliance Specialist
Burns & McDonnell
9400 Ward Parkway
Kansas City , MO 64114

Re: Environmental Assessment- Request for Resource Information and Issue Identification for the Proposed Lonesome Creek Phase II

Dear Ms. Shinn,

The North Dakota Forest Service has reviewed the information concerning the above-referenced project with regard to possible impacts on North Dakota's forest resources pursuant to the National Environmental Policy Act of 1969. We own no land in or adjacent to the proposed project and we believe that the impacts from the project will be minor.

We ask the project proponents to avoid disturbing forested areas where practical, and encourage the replacement of any trees or shrubs destroyed during the construction process or operation of the proposed project.

If you have any questions regarding our comments, please feel free to contact this office.

Sincerely,

Liz Smith, ND Forest Service

Cc: Larry Kotchman, State Forester

Liz Smith, Stewardship Specialist, NDSU-ND Forest Service
Bismarck Field Office 916 E. Interstate Ave. Suite #4 Bismarck, ND 58503
701-328-9916 liz.smith@ndsu.edu www.ndsu.edu/ndfs

C. SHIVN
2F23H

Burns & McDonnell
SINCE 1898

December 6, 2012

Mr. Terry Steinwand
Director
North Dakota Game and Fish Department
100 N. Bismarck Expressway
Bismarck, ND 58501

Re: Environmental Assessment - Request for Resource Information and Issue Identification for the Proposed Lonesome Creek Phase II

Dear Mr. Steinwand,

To ensure electrical power generation reliability in northwestern North Dakota, Basin Electric Power Cooperative (Basin Electric) is proposing to construct two 45-megawatt (MW) simple cycle natural gas turbines (Phase II) and associated infrastructure at the existing Lonesome Creek Station Site (LCS). This site is located in Alex Township of McKenzie County in the SW ¼ of Section 20; T150N; R103W; approximately 14 miles west of Watford, North Dakota (Figure 1).

The U.S. Department of Agriculture's Rural Utilities Service (RUS) is considering an application for financial assistance from Basin Electric for the construction of LCS Units 2 and 3. Basin Electric has retained Burns & McDonnell to prepare an environmental assessment for RUS, which will analyze the potential for environmental impacts associated with constructing and operating the proposed LCS Units2 and 3.

The environmental assessment will be prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4321 et seq.), the Council on Environmental Quality regulations implementing NEPA (40 CFR parts1500-1508), and RUS's "Environmental Policies and Procedures" (7 CFR part 1794), and other applicable statutes, regulations, executive orders, and policies.

The environmental assessment document and associated agency and public input and review will also meet the siting review requirements of Chapter 49-22 of the North Dakota Century Code, North Dakota Energy Conversion and Transmission Facility Siting Act, for the Certificate of Site Application to the North Dakota Public Service Commission.

At this time, we are requesting your input to identify any issues or concerns your agency might have with respect to the proposed project. We are specifically asking for information on potential impacts to the human environmental, including natural and cultural resources information that is either available or should be considered in the environmental assessment document. Additionally, we invite recommendations on measures that may be necessary to protect sensitive resources.

9400 Ward Parkway • Kansas City, MO 64114-3319
Tel: 816 333-9400 • Fax: 816 333-3690 • www.burnsmcd.com

Burns & McDonnell
SINCE 1898

I will be the primary point of contact for this project. Please send your comments to me at Burns & McDonnell, 9400 Ward Parkway, Kansas City, MO 64114. If you have questions regarding this project please contact me at (816) 822-3508 or Cris Miller with Basin Electric at (701) 557-5635. If you need to communicate directly with RUS, which is the responsible Federal agency for NEPA environmental review, you may contact Deirdre Remley, Environmental Protection Specialist, at (202) 720-9640 or at deirdre.remley@wdc.usda.gov. We would appreciate your response by January 10, 2013. We appreciate your time and assistance in providing this information.

Sincerely,

Carla D. Shinn

Carla Shinn
NEPA Compliance Specialist

Enclosure Figure 1, Project Area Map

cc: Mr. Cris Miller, Basin Electric

North Dakota Game & Fish Dept.
100 N. Bismarck Expressway
Bismarck, ND 58501-5095

We have reviewed the project and foresee no identifiable conflict with wildlife or wildlife habitat based on the information provided.

(for) Greg Link
Chief, Conservation & Communication Division
Date: 1/7/13

"VARIETY IN HUNTING AND FISHING"

NORTH DAKOTA GAME AND FISH DEPARTMENT

100 NORTH BISMARCK EXPRESSWAY BISMARCK, NORTH DAKOTA 58501-5095 PHONE 701-328-6300 FAX 701-328-6352

10 December 2012

ND Game & Fish Department
13932 West Front Street
Williston, ND 58801

Carla Shinn
NEPA Specialist
Burns and Mc Donnell
9400 Ward Parkway, Kansas City, MO 64114

Dear Ms. Shinn;

By letter dated 6 December 2012, you request information from the ND Game & Fish Department. I have forwarded your request for Resource Information and Issue Identification for the Proposed Lonesome Creek Phase II for the Environmental Assessment to Greg Link. Greg Link is the Chief of the Conservation and Communication Division in our Bismarck office and will be lead in responding to your request.

Sincerely,

Kent Luttschwager

Kent Luttschwager
Wildlife Resource Supervisor

North Dakota State Water Commission

900 EAST BOULEVARD AVENUE, DEPT 770 • BISMARCK, NORTH DAKOTA 58505-0850
701-328-2750 • TDD 701-328-2750 • FAX 701-328-3696 • INTERNET: http://swc.nd.gov

January 7, 2013

Carla Shinn
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114-3319

Dear Ms. Shinn:

This is in response to your request for review of environmental impacts associated with the Proposed Lonesome Creek Phase II Project. The site is located in Alex Township of McKenzie County in the SW ¼ of Section 20; T150N; R103W; approximately 14 miles west of Watford City, North Dakota.

The proposed project has been reviewed by State Water Commission staff and the following comments are provided:

- There are no floodplains identified and/or mapped where this proposed project is to take place. The project takes place in an unmapped county. No floodplain permits are necessary from McKenzie County relative to the National Flood Insurance Program.

- It is the responsibility of the project sponsor to ensure that local, state and federal agencies are contacted for any required approvals, permits, and easements.

- All waste material associated with the project must be disposed of properly and not placed in identified floodway areas.

- No sole-source aquifers have been designated in ND.

There are no other concerns associated with this project that affect State Water Commission or State Engineer regulatory responsibilities.

Thank you for the opportunity to provide review comments. If you have any questions, please call me at 701-328-4967.

Sincerely,

Linda Weispfenning
Water Resource Planner

LW:dp/1570

STATE HISTORICAL SOCIETY OF NORTH DAKOTA

December 4, 2012

Ms. Carla Shinn
NEPA Compliance Specialist
Burns & McDonnell
9400 Ward Parkway
Kansas City, MO 64114-3319

ND SHPO Ref.:13-0358 RUS Basin Electric Power Cooperative's proposed Lonesome Creek Station two 45-MW natural gas turbines (Phase II) and associated infrastructure in portions of [T150N R101W Section 23 SW ¼] McKenzie County, North Dakota

Dear Ms. Shinn,

We reviewed ND SHPO Ref.:13-0358 RUS Basin Electric Power Cooperative's Proposed Lonesome Creek Station two 45-MW natural gas turbines (Phase II) and associated infrastructure in portions of [T150N R101W Section 23 SW ¼] McKenzie County, North Dakota and if consulted by a federal agency, would concur with a "No Historic Properties Affected" determination, provided the project remains as described and mapped in your correspondence dated December 6, 2012. We note the previous submission of the cultural resource report entitled "Basin's Lonesome Creek Station: A Class III Cultural Resource Inventory in McKenzie County, North Dakota & Addendum," which noted no cultural resources in the project area.

Thank you for the opportunity to review this project. If you have any questions please contact Susan Quinnell, Review and Compliance Coordinator at (701) 328-3576, e-mail squinnell@nd.gov

Sincerely,

Merlan E. Paaverud, Jr.
State Historic Preservation Officer (North Dakota)
and Director, State Historical Society of North Dakota

North Dakota Heritage Center • 612 East Boulevard Avenue, Bismarck, ND 58505-0830 • Phone: 701-328-2666 • Fax: 701-328-3710
Email: histsoc@nd.gov • Web site: http://history.nd.gov • TTY: 1-800-366-6888

ENVIRONMENTAL & STATISTICAL CONSULTANTS

4007 State Street, Suite 109, Bismarck, ND 58503
Phone: 701-250-1756 ◆ www.west-inc.com ◆ Fax: 701-250-1761

March 19, 2013

Cris Miller
Basin Electric Power Cooperative
1717 East Interstate Ave
Bismarck, North Dakota 58503

RE: Lonesome Creek Generator Station Wetlands

Dear Mr. Miller,

Western EcoSystems Technology, Inc. (WEST) conducted an initial review of wetland features for the Lonesome Creek Generator Station in the SE ¼ of Sec 23, T150N, R101W on January 27, 2012 (see attached map). Further, WEST reviewed the current National Wetland Inventory (NWI) data layer, National Hydrologic Dataset (NHD) information, and SSURGO soils database information to investigate if hydric soils were present on March 19, 2013. While the proposed station only encompasses the northern 40 acres of this quarter section, shown in yellow highlighted area on the map, the entire quarter section was reviewed.

Beside the database reviews, WEST completed a field survey of the transmission line route that is shown in red on the attached map and found no wetlands or waterbodies along the transmission line route within this quarter section. This includes the NHD line that is generally analogous to "blue lines" on USGS topographic maps that is within the western boundary of the generator station site.

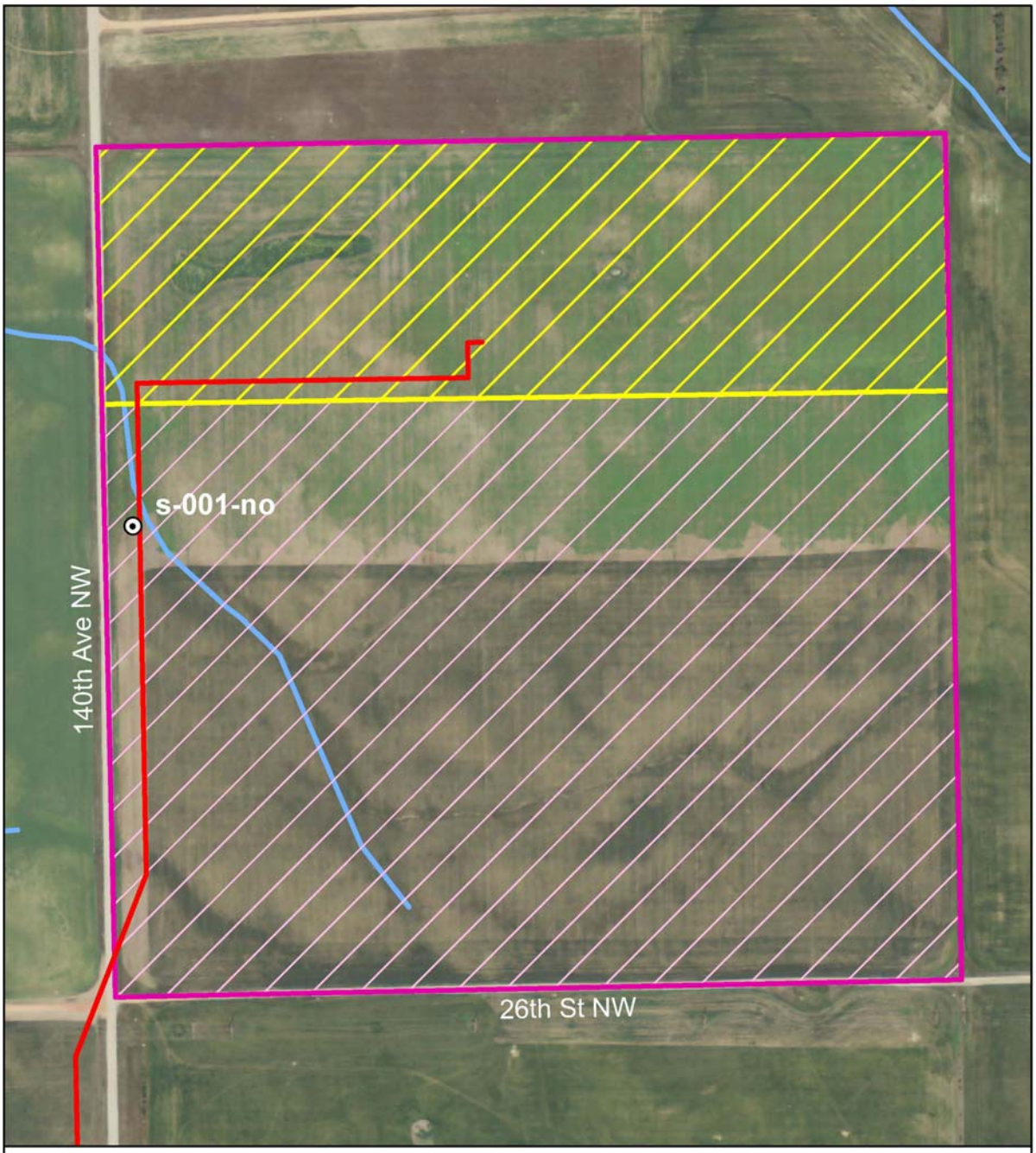
Based on the database review and field mapping of the transmission line, the quarter section as described does not contain any NWI wetlands, waterbodies, or hydric soils.

Please let me know if you need anything further.

Sincerely

Clayton Derby
Senior Manager

Attached: Map of SE ¼ of Sec 23, T150N, R101W



Map Features

- Area Reviewed
- Proposed Plant Site
- Proposed Transmission Line Route
- No WaterLine Feature *(WEST Delineation)*
- NHD Streams

Background: NAIP 2012 Aerial Image

Lonesome Creek Station

SW1/4 Sec 23, T. 150 N., R. 101 W.
McKenzie Co., ND

N W E S

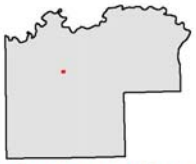
0 135 270 540 Feet

0 25 50 100 Meters

WEST

Map produced on 03/19/2013 by T. Thorn

Map Location



McKenzie County, North Dakota

APPENDIX B - LOAD FORECAST

Appendix B--Load Forecast

Basin Electric's primary mission is to provide electrical power to its member-owners. In order to accomplish this objective, the member 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 Rural Utilities Service (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.

The Load Forecast Technical Committee approved the timetable and procedures used in preparing the 2012 Load Forecast. 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; the 2012 Update of the 2011 Load Forecast Work Plan was 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 Generation and Transmission cooperative (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 individual member's load forecast analyzed the cooperative's service area for historical and projected developments that have and will influence future load growth

The 2012 Load Forecast 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.

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 Load Forecast, 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, Autoregressive Integrated Moving Average (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.

Econometric models are used for the majority of the member systems to forecast residential sales. In most instances, two residential 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

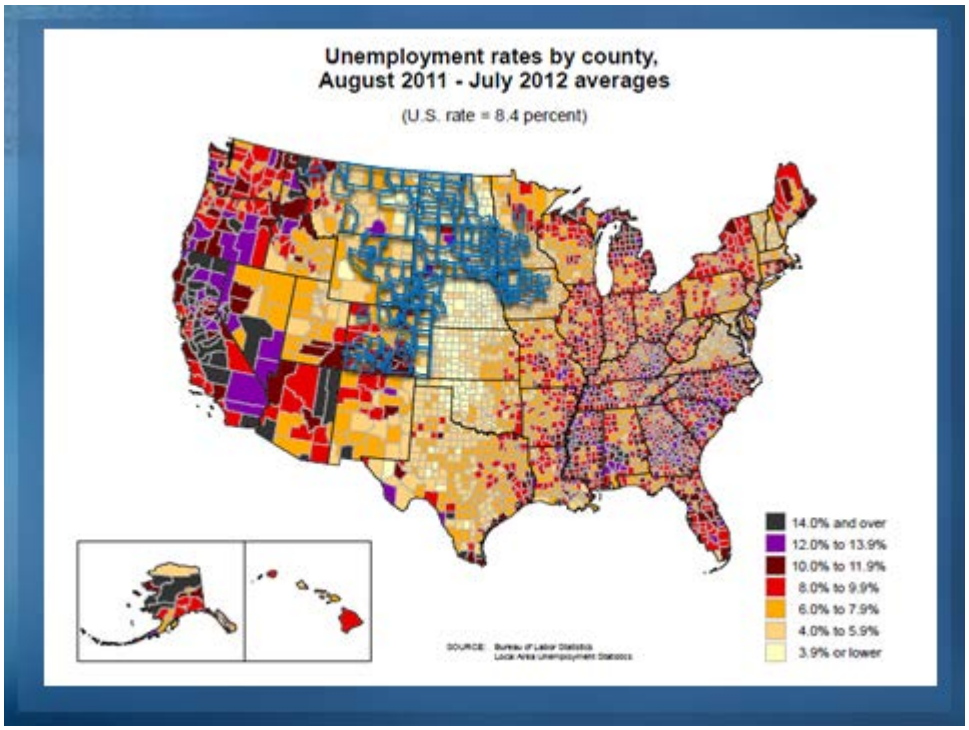
numbers in the past. The second model is developed for the average annual usage per residential consumer. Multiplying the forecasts of these two models developed the total residential energy forecast.

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.

Explanatory Variables

The economy of the upper Midwest has faired the recent nationwide economic downturn quite well, due to the relative strength of the agricultural economy and energy exploration. Employment 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 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.



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 2009. The exception to this is the population data, where W&P data was updated to include the 2010 data available from the US Census Bureau.

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.

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 Load Forecast, 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 Load Forecast 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.

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.

Inflation Indexes

For the 2012 Load Forecast 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).

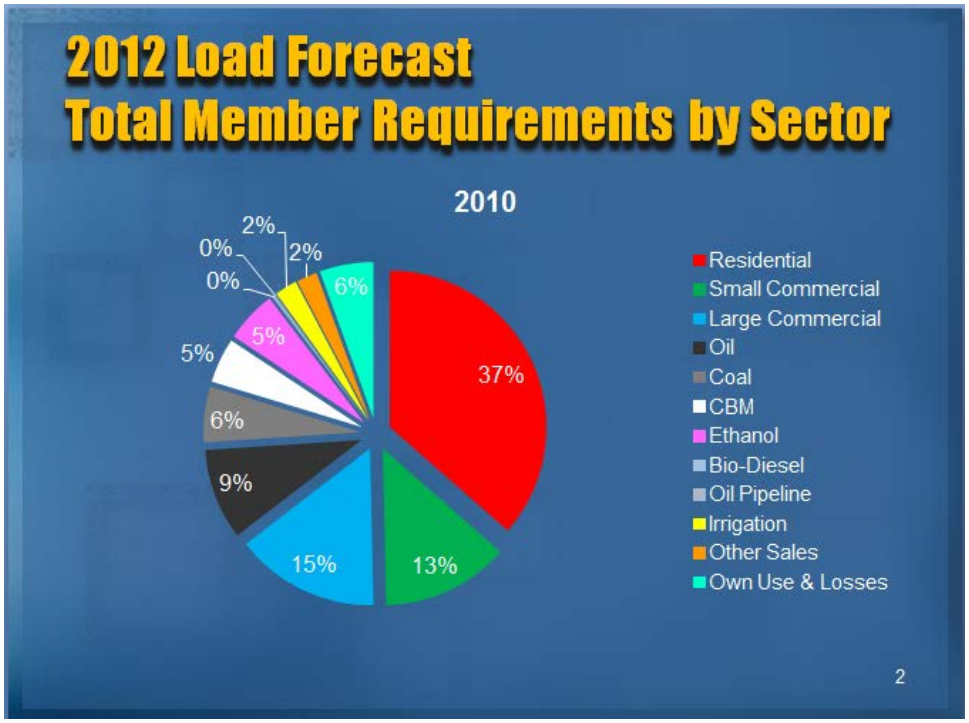
Gross Domestic Product - Implicit Price Deflator (GDP-IPD): This index is used to deflate all agricultural monetary data from FAPRI to real 2010 dollars. The forecast is obtained from the Congressional Budget Office.

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.

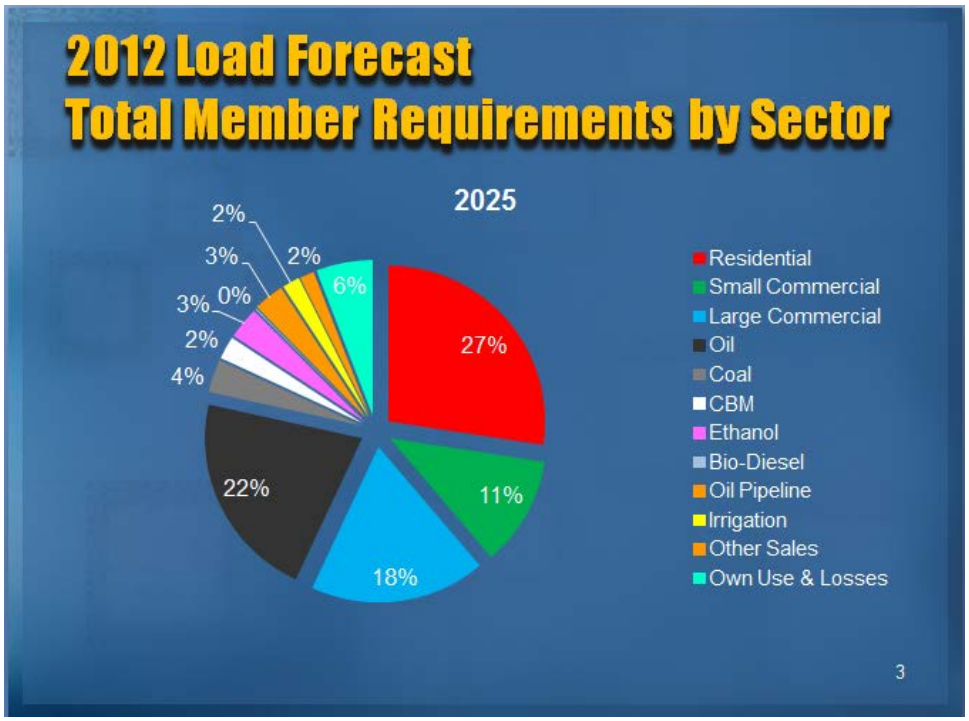
In addition to the previously mentioned forecast variables, there is a tremendous array of commercial projects being monitored for their impacts on Basin Electric's wholesale energy sales. These industries are oil, coal, coal bed methane (CBM), ethanol, and bio-diesel related. Each of these categories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

BASIN ELECTRIC: LOAD FORECAST SECTORS

In 2010 Basin Electric's membership sold 37% of their energy to the residential sector. The large and small commercial represented 15% and 13% of sales respectively. The other 35% of sales were spread among the remaining sectors.



At the end of the forecast period the growth in the oil-related sector is evident. Sales to this sector are forecasted to grow from 9% of sales in 2010 to 22% of member sales in 2025.Other growth is overshadowed by the growth in this sector. In this section, we will discuss each sector in detail.



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.

The make-up of the small commercial accounts is generally larger farms, small retail and wholesale establishments and other types of accounts that do not qualify for residential status. It has been observed that the small commercial sector closely mirrors the cooperatives local and regional economy. Therefore, the small commercial sector is generally modeled using the same type of variables that are used in the residential modeling.

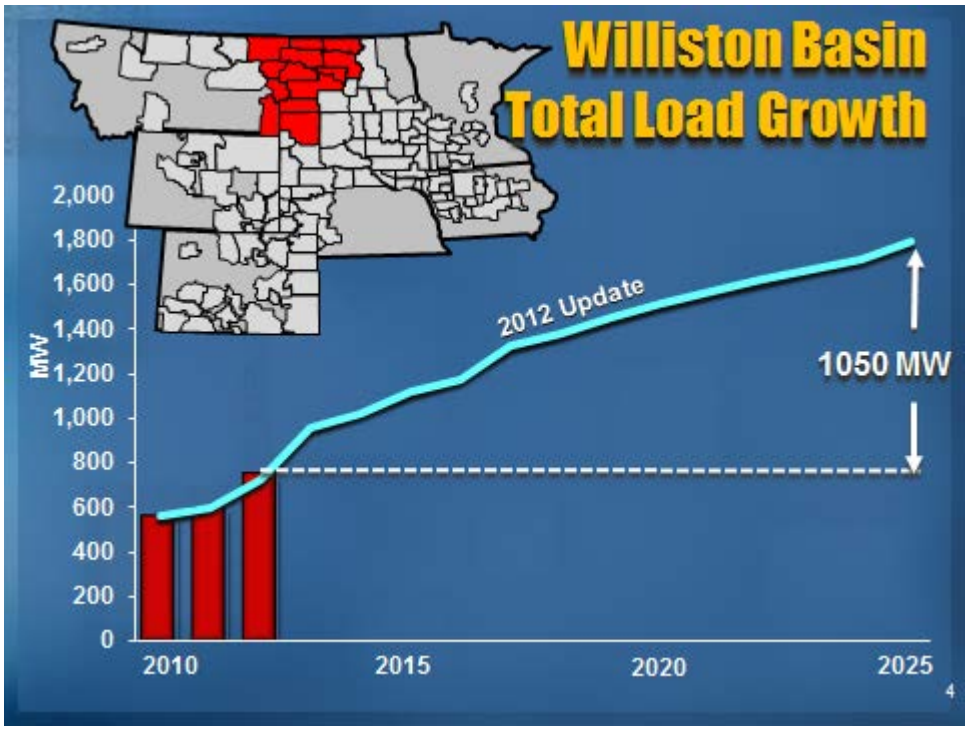
Large Commercial

The large commercial classification consists of commercial accounts that are generally 1,000 kVA or larger. The types of businesses that are included in this classification are generally manufacturing, large retail, and processing facilities. These types of businesses do not necessarily mirror the local economy. The factors that drive these accounts usually have national impacts. Therefore, we use national macroeconomic variables to determine annual energy usage.

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. Significant oil related commercial load growth is not anticipated in the PRB, therefore, the rest of this section deals with the Williston Basin.

The following graph depicts the growth of the oil related load within the Williston Basin. A tremendous amount of growth is expected in the next 15 years.



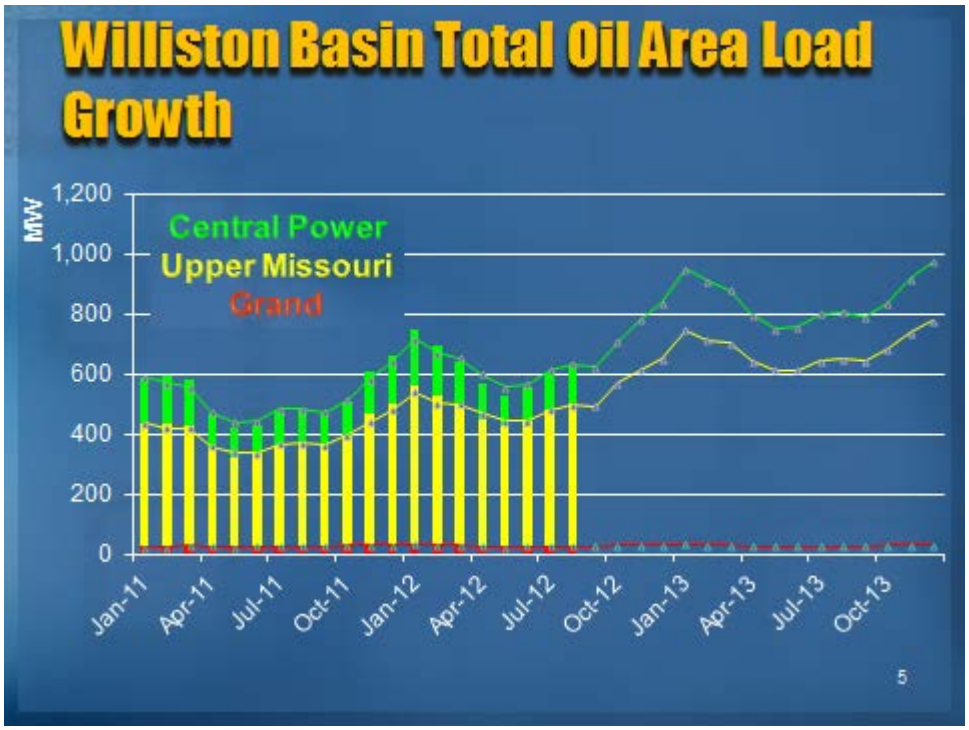
The small and large commercial loads of those members that serve in the heavy oil production areas of the basin are heavily influenced by oil and gas exploration, production and distribution activities. Direct loads, such as oil pumps, pipelines, compressors and processing plants contribute directly to the amount of commercial load. Other commercial loads, such as support services, are indirectly related to oil activity as they would not exist without the oil exploration, development and extraction activities.

For those members whose commercial loads are heavily influenced by oil activities, three tier econometric models were developed to project their commercial loads.

The econometric models generally consist of three models for each distribution cooperative. They generally address new oil production, oil prices, and number of commercial consumers, total commercial energy, and other factors. New upcoming oil projects and services are also included.

The most important variable in the determination of oil production and related loads is crude oil prices. The crude oil price used in the models is the domestic refiner's acquisition cost of crude oil, which represents an average cost the domestic refiners pay for their crude oil.

The following graph depicts the monthly performance of the 2012 Load Forecast for the members located within the Williston Basin. Winter 2011-2012 load levels were experienced by November 2012, before the heavy onset of the heating season.



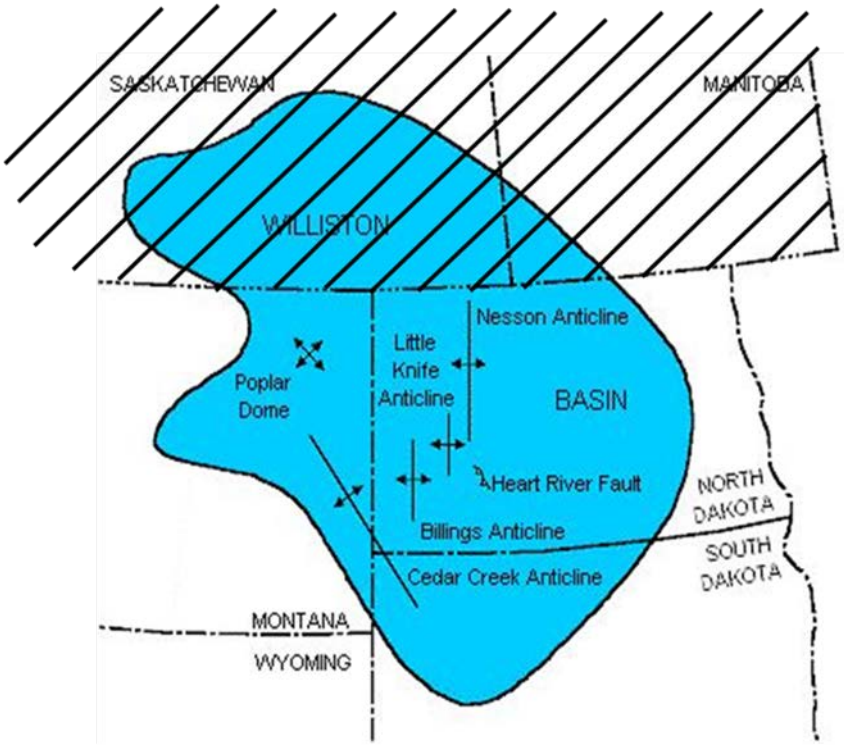
Oil loads have been somewhat cyclical in the past. This was mainly due to oil price volatility. Domestic oil prices are largely influenced by international oil markets, which are influenced by sometimes radical conditions and unstable situations. Oil prices are also significantly influenced by radical 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.

WILLISTON BASIN OIL AND GAS RELATED INDEPENDENT LOAD FORECAST

Due to the unprecedented electric growth expected in the forecast period, a decision was made to get another opinion of the growth potential for the Williston Basin. This forecast not only looked at the oil industry, but includes the electrical load 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 focused on the electric utilities' service areas, encompassing all of the Williston Basin within the United States. The following graphic details the area covered by the study.



The North Dakota Transmission Authority (NDTA) was the lead agency for procuring a consultant to perform the study. Due to the impact and breadth of this growth, four parties were involved in this contract, the North Dakota Transmission Authority, Basin Electric Power Cooperative, MDU, and the oil industry through the North Dakota Petroleum Council.

Kadrmas, Lee & Jackson (KLJ) were the consultants selected to perform the forecast. The 2012 Power Forecast – Williston Basin Oil and Gas Related Electrical Load Growth Forecast (PF12) was completed in October 2012. Public results were presented to the North Dakota Industrial Commission in October. Basin Electric results were presented to the Basin Electric Power Cooperative Board of Directors in November 2012.

Load Forecast Model and Inputs

The consultant performed an assessment of Williston Basin oil and gas activity and developed an econometric model for the development of the oil plays within the service area. The independent input assumptions to this model included, but not be limited to, the following:

Required Infrastructure. The consultant evaluated 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 developed a correlation between well count and required infrastructure.

Drilling Activity. The consultant evaluated, assessed and forecasted 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 determined the energy requirements of new wells in the Bakken/Three Forks, Tyler, and Spearfish formations. The consultant also determined well spacing and energy requirements per drill site to fully develop the oil play.

Power Requirements. The consultant developed qualitative oil and gas production curves and identified the pumping loads for a generic well in each of the identified formations. In addition, they will determined 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 identified 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.

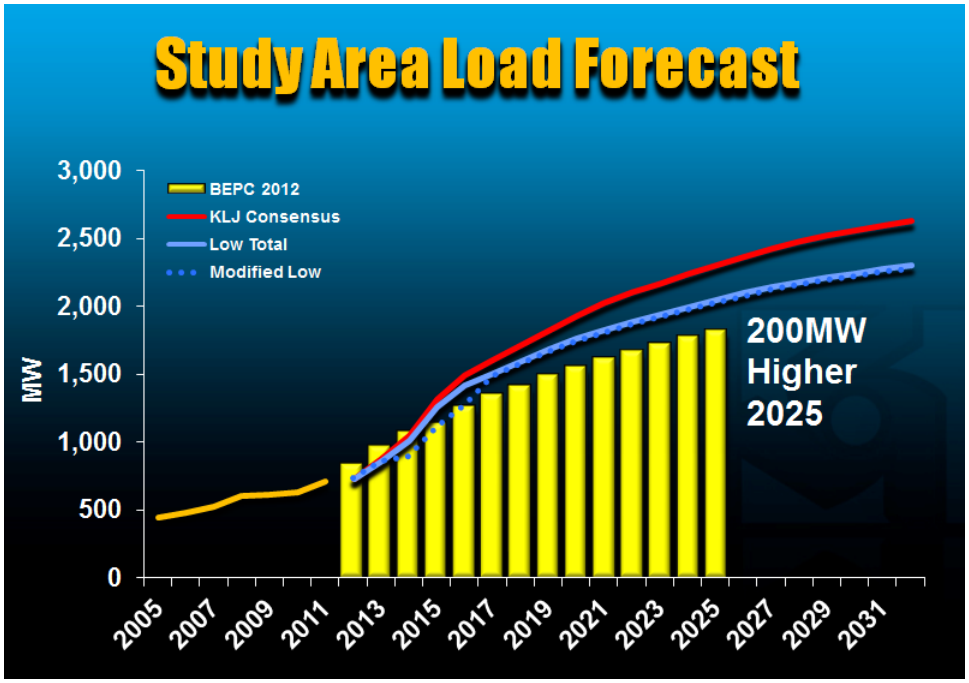
Oil Price Forecasts. The consultant provided an independent high, medium and low regional oil price forecast for the 20-year forecast period, along with a break even oil price range by formation for continued development.

Pipeline and Refinery Capacity. The consultant determined 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.

Opinions. The consultant included 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.

Independent Oil Load Forecast Model Results

The results of the independent assessment of the energy needs for the Williston Basin were similar to the Basin Electric forecast. Due to timing issues, some of the projects included in the PF12 were cancelled or delayed. To reflect these changes, the PF12 was modified to reflect these changes. The following graph compares the forecasts. Due to the similar expectations of future load growth in the intermediate term, a decision was made to continue using 2012 Load Forecast for planning for future power supply needs.



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 Administration (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, 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, Powder River Energy Corporation (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.

Due to the increase of extensive shale drilling in the United States, higher cost coal bed methane natural gas has been relegated to a niche play, and growth is not expected in this sector.

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. No new facilities are expected during the forecast period.

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.

BASIN ELECTRIC: LOAD FORECAST RESULTS

The Basin Electric load forecasts are prepared for the three levels of membership. At each level of membership the total energy and demand needed is totaled and is required to be approved by the board of directors of that particular cooperative. Each of the three levels of load forecasts is discussed as follows;

Distribution Cooperative Load Forecasts

The previous forecasting process is employed, with the exception of Tri-State, for each Basin Electric distribution cooperative. The resultant load forecast provides the member with a detailed document outlining the derivations and assumptions utilized in the preparation of its forecast. Member involvement is an integral part of this process as the members provide retail rate projections, judgmental forecasts, and review the econometric models for forecast reasonability and explanatory variable appropriateness. The final product provides each distribution cooperative with a forecast of its annual energy sales by consumer category and monthly forecasts of its wholesale power demand and energy requirements.

G&T Cooperative Load Forecasts

The G&T's Load Forecasts are prepared by adding together the projected purchases of their distribution members. Transmission losses and member diversity within G&T's are also considered where applicable. The G&T Load Forecasts provide a forecast of the total sales of the G&T distribution member categorized according to consumer classifications. It also contains a forecast of the total wholesale power requirements of the G&T. These power requirements are

separated into Western and Basin Electric, along with any other power suppliers' components in accordance with the member's contracts with the power supply organizations.

Basin Electric's Load Forecast

Basin Electric's Load Forecast is prepared by adding together the projected power requirements of its 19 Class A Members and the three Class D Members. The resultant forecast reflects the combined power requirements of Basin Electric member cooperatives.

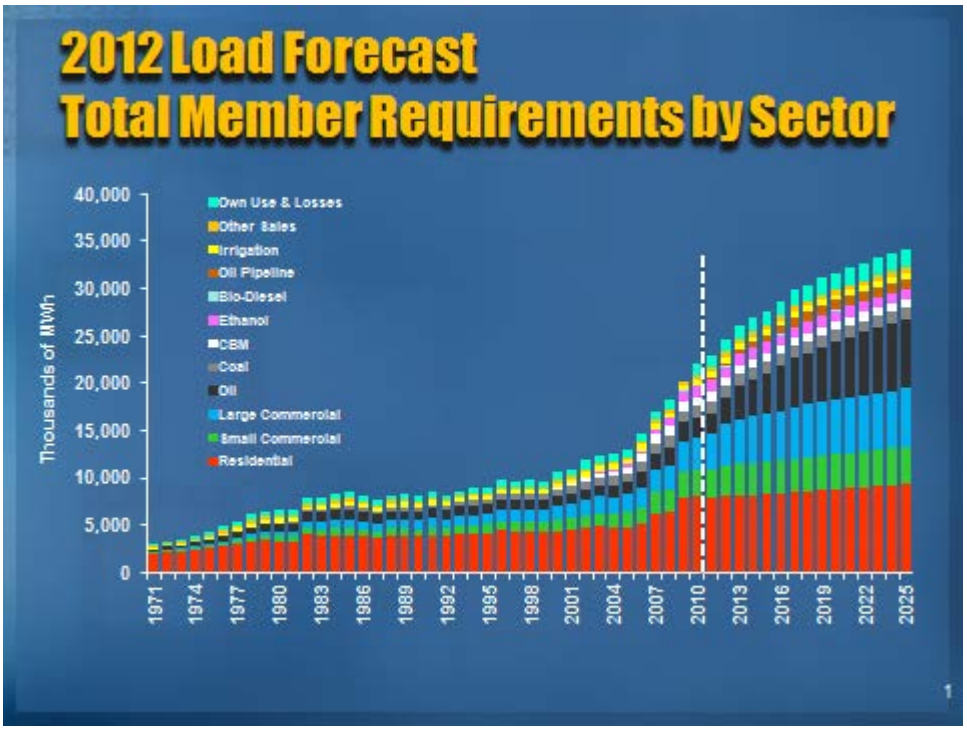
These results are then translated into a model that represents the Basin Electric system on a delivery point basis. This allows the planning of infrastructure improvements to be made where needed.

The Load Forecast is then monitored on a monthly basis to ensure that the forecast is performing as expected. Also, due to the detailed information available from the large commercial sector, individual projects can be monitored to ensure that they are proceeding as planned. If the load deviates significantly from the forecast, modifications can be made for future load forecasts.

SUMMARY OF THE LATEST LOAD FORECAST

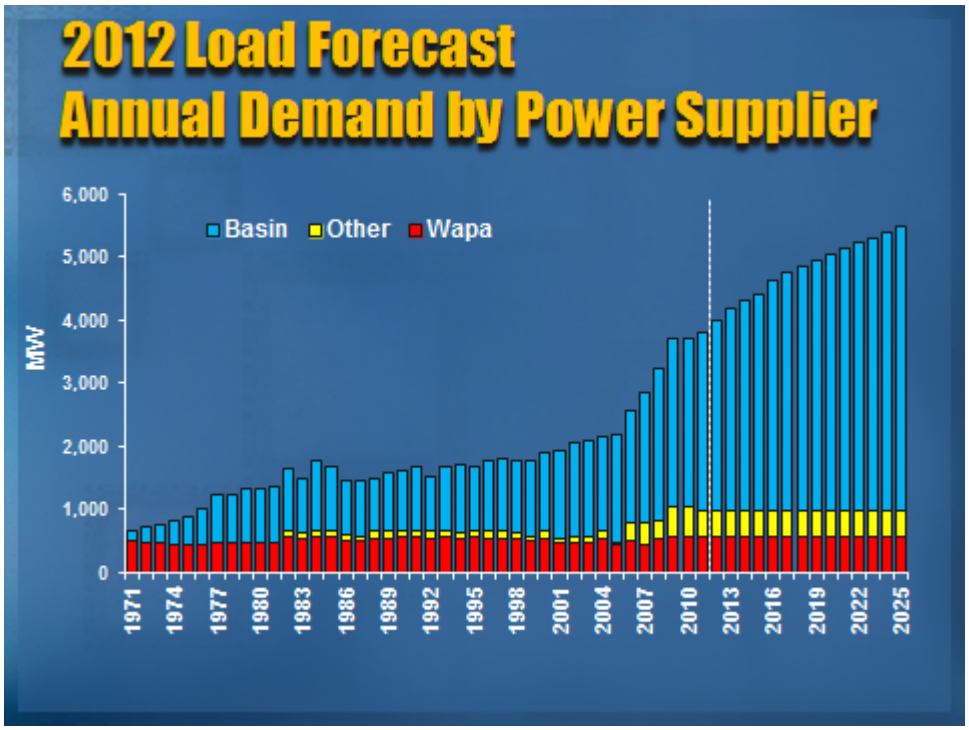
Member Forecast

The following graph shows actual total member sales by class such as residential, commercial, etc., from 1971 to 2010 and projected member sales by class from 2011 to 2025. The need for additional generating capacity is driven by the increasing use of electricity and the resulting load growth including industrial growth, energy sector (coal, oil, gas and ethanol biodiesel) development and new rural development. Between actual 2010 and forecasted 2025, Basin Electric's portion of this load growth is expected to grow 12.3 million MWh in total energy sales which is approximately 820,387 MWh per year. 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.



Basin Electric finalized the 2012 Load Forecast which went to the Basin Electric Board of Directors in April 2012 and was sent on to the RUS for approval in April 2012. Basin Electric received approval of the 2012 Load Forecast from RUS in June 2012.

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.

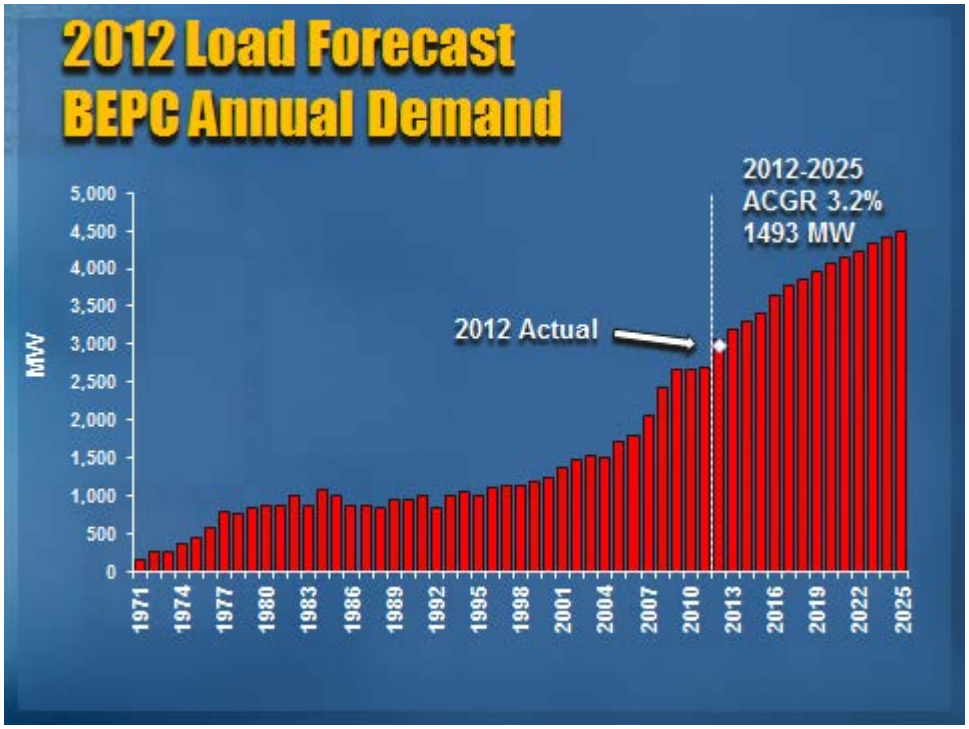


After other power suppliers obligations are considered, the remainders of the loads are Basin Electric's responsibility. The following graph depicts the expected Annual Demands for Basin Electric.

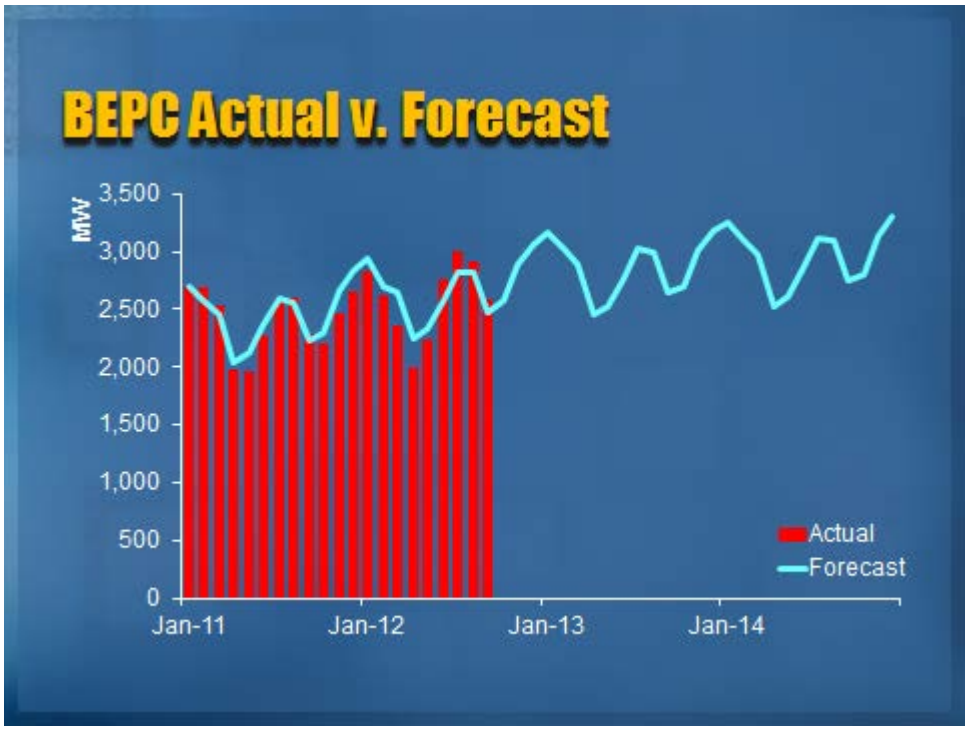
The following table shows Basin Electric's member energy sales and member peak demand from 2004 through 2010. System peak demand increased on average by 186 MW annually from 2004 to 2010. System energy sales have been increasing on average by 1,158,173 MWh annually from 2004 to 2010. The total system experienced annual average percent load factors in the high 60's during this same time period.

Historical Member Sales (Billing load levels)

Year	Peak MW	Annual MWh
2004	1,542	9,559,319
2005	1,709	10,291,152
2006	1,933	11,759,408
2007	2,053	12,912,847
2008	2,421	14,073,369
2009	2,672	14,947,627
2010	2,658	16,508,356
Average Annual Increase	**186**	**1,158,173**



The following graph 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.



The 2012 Load Forecast 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.

Existing Resources

SUPPLY SIDE RESOURCES

1. Leland Olds Station: Leland Olds Unit 1 was placed in-service on January 9, 1966 and is a base-load coal fueled unit located near Stanton, ND with a net capacity of 222 MW. Leland Olds Unit 2 is a coal fueled unit that was placed in-service on December 15, 1975 and its net capacity is rated at 445 MW. Basin Electric installed emission control equipment at the Leland Olds Station which requires an increase to the station service. This equipment was put in service after the 2012 fall outage on Unit 2 reducing the net capacity from 448 MW to 445 MW due to additional station service required. The Unit 1 emissions control equipment is scheduled to be placed into service after the spring 2013 maintenance outage. Leland Olds Station Unit 1 is the oldest baseload generating unit in Basin Electric's fleet and its current depreciable life is listed as 2030 while Unit 2 is 2040. While this

seems relatively close, Basin Electric has verified the useable life of the equipment and successfully been granted depreciable life extensions from the Rural Utilities Service in the past.

2. Laramie River Station: Basin Electric, together with five other consumer-owned power supply entities, began construction of the three coal-fired baseload units at Laramie River Station near Wheatland in southeast Wyoming in July, 1976. LRS has three steam turbine generators supplied by General Electric Company and three steam boilers supplied by Babcock and Wilcox Company. 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 owns 42.27 percent of the entire project, which results in 723 MW today. 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 and the amount of power Basin Electric receives from the western units is 675 MW. LRS was financed through the RUS for all but 19.8 percent. The 19.8 percent financed elsewhere pertains to pollution control bonds and Tax Benefit Transfers. Tax Benefit Transfers were a financing mechanism allowed by the IRS several years ago where an entity that was unable to use tax credits was able to sell those to an entity who could use the credits against the income taxes to be paid. Currently Laramie River Station Units 1, 2, and 3 have a depreciable life to 2032, 2033, and 2034 respectively for financial purposes.

3. Antelope Valley Station: Antelope Valley Station (AVS) is a two-unit lignite-fired steam electric generating station located in Mercer County, North Dakota. AVS Unit 1 went into commercial operation on July 1, 1984 and AVS Unit 2 went into commercial operation June 1, 1986. AVS is equipped with two steam turbine generators supplied by Westinghouse Electric Corporation and two steam boilers supplied by Combustion Engineering. The most recent Uniforms Rating of Generating Equipment (URGE) is 450 MW for AVS Unit 1 and 450 MW for AVS Unit 2. Antelope Valley provides approximately 135 MW of electric power for the neighboring Dakota Gasification Company's Great Plains Synfuels Plant. Designed to be environmentally sound, over $319 million has been invested in capital pollution control asset investments for AVS, to date. Dry scrubbers use lime to capture and remove up to 90 percent of sulfur dioxide emissions from stack gases. Fabric filter bag houses capture and remove up to 99 percent of particulate matter. Each bag house contains

more than 8,000, 35-foot tall bags. AVS is a "zero-discharge" facility. Even water is used efficiently only leaving the plant site through evaporation. Basin Electric is 100 percent owner of AVS. A portion (45.3%) of AVS Unit 1 was financed through RUS while the other portion (54.7%) was financed through pollution control financing and a loan from CoBank that subsequently replaced a leveraged lease financing. AVS Unit 2 was not financed by the Rural Utilities Service (RUS) but rather by pollution control financing and a leveraged lease. For financial purposes, Antelope Valley Units 1 and 2 have a depreciable life to the years 2036 and 2038 respectively.

4. Spirit Mound Station: Basin Electric placed in service a two-unit, 60 MW nameplate No. 2 fuel oil combustion turbines on June 30, 1978 to provide power as a peaking resource. The combined winter rating of the two units is 120 MW and the summer rating is 100 MW. 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 site can store in containers up to 8 million gallons of fuel. When the station is in use it consumes 100 gallons of fuel per minute. The Spirit Mound Station is located near Vermillion, SD. Spirit Mound Station has a depreciable life lasting through 2025 for financial purposes.

5. Earl F. Wisdom Unit 1: Earl F. Wisdom Generating Station Unit 1 is a 38 MW coal based unit located near Spencer, IA. 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. In February, 2015, Wisdom Unit 1 will be forced to stop burning coal in accordance with the Utility Mercury and Air Toxics Standards (ATS) rules. Corn Belt retained Burns and McDonnell to perform a technology assessment for Wisdom covering five options. These options were included in Basin Electrics analysis of future resource options.

6. Earl F. Wisdom Unit 2: Basin Electric partnered with Corn Belt Power Cooperative to build the 80 MW General Electric model 7EA natural gas peaking unit near Spencer, Iowa. Although the combustion turbine uses natural gas as a primary fuel, it can also burn fuel oil as a contingency. 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. Therefore Basin Electric has 93.75% or 75 MW from the 80 MW combustion turbine. Wisdom Unit 2 has a depreciable life lasting to 2037.

7. Wyoming Distributed Generation: The Wyoming Distributed Generation consists of 9 peaking resource units located at 3 sites; Arvada, Hartzog, and Barber Creek released for commercial operation in 2002. These units are natural gas fired simple cycle turbines manufactured by Solar and consisting of a total net output of 45 MW summer and 54 MW winter. The turbines are used to hold a portion of the necessary reserves for Basin Electric's west side electrical requirements. Financially, the Wyoming Distributed Generation turbines have a depreciable life ending in 2035.

8. Groton Generation Station: The Groton Generation Station near Groton, SD consists of 2 General Electric LMS100 simple cycle gas turbines which provide about 98 MW for Unit 1 and 97 MW for Unit 2 (winter rating) as peaking resources. Basin Electric commissioned Groton Unit 1 in 2006 which was the first commercial application of General Electric's LMS100. Unit 2 began providing power as a peaking resource in 2008. The two gas turbines get their natural gas from the Northern Border Pipeline. Through Dakota Gasification Company's Great Plains Synfuels Plant, the units have firm gas transport which gives them fuel security without requiring a backup or alternative fuel supply. A unique aspect of the station is the ability that Unit 1 has to disconnect the generator from the gas turbine through a synchronous clutch allowing the generator rotor to spin independent from the gas turbine to provide voltage stability to the electrical grid.

9. Culbertson Generation Station: The Culbertson Generation Station, near Culbertson, MT is a single LMS 100 simple cycle gas turbine providing 91 MW (winter rating) of peaking power. Operating since 2010, Culbertson Unit 1 is Basin Electric's first resource located in Montana. Similar to the Groton Generation Station, Culbertson Unit 1 has no need for an alternative fuel source as it receives its fuel from the Northern Border Pipeline and has firm gas transport via the Great Plains Synfuels Plant.

10. Deer Creek Station: The Deer Creek Station combined-cycle natural gas facility is a 300 MW intermediate resource located near White, SD. This is the newest unit in Basin Electric's fleet achieving commercial operation in August of 2012. The combined-cycle plant electrical generators are powered by a General Electric model 7FA gas turbine and an Alstom steam turbine. The natural gas fuel used by the station comes from the Northern Border Pipeline where firm gas transport is possible through Dakota Gasification Company's Great Plains Synfuels Plant. The exhaust gases

from the gas turbine pass through a heat recovery steam generator where they boil water into steam and provide steam to the Alstom steam turbine. When the combustion turbine has reached full load, duct burners can burn additional fuel within the heat recovery steam generator to produce more steam and reach the full station output ability of 300 MW.

11. Dry Fork Station: The Dry Fork Station is a 405 MW coal fired power plant located 10 miles north of Gillette, Wyoming which was released for commercial operation in 2011. Basin Electric owns 92.9% of the station or 376 MW of the baseload resource. The station utilizes Powder River Basin coal from the next door Dry Fork Mine to ensure an uninterrupted, stable priced fuel supply. The latest generation of pollution control technology was implemented resulting in very low emission rates.

12. Pioneer Generation Station: Basin Electric is finishing construction of Pioneer Generation Station unit 1 which consists of a 45MW General Electric LM6000 natural gas fired simple cycle combustion turbine located near Williston, North Dakota. This peaking resource fueled by natural gas from the Northern Border Pipeline is projected to be in-service the spring of 2013. Unit 1 has a synchronous clutch located between the combustion turbine and generator allowing the generator rotor to rotate independent of the turbine to provide voltage stability to the electrical grid.

13. Lonesome Creek Station: The Lonesome Creek Station Unit 1 is under construction of unit 1 which is a 45 MW GE LM6000 natural gas fired combustion turbine located near Watford City, North Dakota. This peaking resource fueled by natural gas from the Northern Border Pipeline is projected to be placed in service during the spring of 2013. Unit 1 will also have a synchronous clutch located between the combustion turbine and the generator allowing the generator rotor to spin independent of the turbine providing voltage stability to the electrical grid.

14. 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. Chamberlain Wind Project is owned by Basin Electric Power Cooperative and the energy is delivered to members as part of Basin Electric's overall power supply. The Chamberlain wind turbines have a depreciable life lasting to 2022 for financial purposes.

15. 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 facility is owned by Basin Electric's subsidiary PrairieWinds ND 1 Inc. and energy is purchased by Basin Electric and delivered to members through a long term power purchase agreement with PrairieWinds ND1 Inc. The Minot Wind turbines have a 20 year depreciable life showing their financial end of life in 2023 and 2029 per their installation dates.

16. PrairieWinds 1: Basin Electric, in partnership with PrairieWinds ND 1 Inc., has constructed a wind energy project of 77 turbines near Minot, North Dakota which is owned by Basin Electric's subsidiary PrairieWinds ND 1 Inc. Basin Electric purchases the output of the 115.5 MW capacity wind project via a long term power purchase agreement PrairieWinds 1 was placed into commercial service in December, 2009. With a 20 year depreciable life allowed, the wind turbines are shown with an end of service to 2029 from a financial perspective.

17. Crow Lake Wind Project: Basin Electric, in partnership with PrairieWinds 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 in 2011. Basin Electric's subsidiary, PrairieWinds SD1, owns 100 turbines or 150 MW. Basin Electric has a purchase power contract for the output from all 108 turbines or 162 MW from the Crow Lake Wind Project. The 20 year depreciable life is shown from 2011 to 2031.

POWER SUPPLY CONTRACTS

1. George Neal Station Unit 4: Unit 4 is a 644 MW coal-fired electric generation facility located south of Sioux City, Iowa that has been providing baseload power since 1979. Basin Electric and Northwest Iowa Power Cooperative (NIPCO), one of Basin Electric's member cooperatives, 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 4 of the George Neal Generating Station. 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 its 73 MW of uncommitted capacity and associated energy from Unit 4 of the George Neal Station. 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. Unit 4 is connected to MidAmerican Energy Company (MEC) where NIPCO and Corn Belt have rights to bring this energy to the IS or the Midwest Independent Transmission System Operator (MISO) via MEC.

2. Walter Scott 3 and 4: The Walter Scott Energy Center located near Council Bluffs, IA provides baseload power through the 690 MW Unit 3 and the 790 MW Unit 4. While both of the units are coal-based, Unit 3 has been operating since 1979 and Unit 4 began operation in 2007. 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 its 26 MW of uncommitted capacity and associated energy from Unit 3 and 45 MW of uncommitted capacity and associated energy from Unit 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. Walter Scott 3 and 4 are connected to MidAmerican Energy Company (MEC) where Corn Belt has rights to bring this energy into the IS or MISO via MEC.

3. Duane Arnold Energy Center: The Duane Arnold Energy Center consists of a 615 MW nuclear powered unit located near Cedar Rapids, IA, that has been providing baseload power since 1975. 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 10% share which is about 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. Interconnected to the Alliant West (ALTW) system, Corn Belt has the rights to bring the power to Corn Belt's transmission system which is within the WAUE balancing area.

4. 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 and for Basin Electric to return a like amount of energy to Western during off-peak periods. This contract has been extended through the year 2039.

5. Western Native American Purchase: Basin Electric receives a Native American Allocation of 37 MW in the winter and 38 MW in the summer season. This allocation is a result of congressional action that made federal power available to the Native Americans.

6. Madison Diesel: Basin Electric purchases capacity and energy output (when scheduled) from diesel generators owned by the City of Madison, South Dakota. The purchase is for five, 2 MW Caterpillar diesel generators that went commercial in April 2005. The agreement goes through December 2025.

7. Northern Border Waste Heat: Basin Electric purchases the energy from eight Recovered Energy Generation (REG) power plants fueled by hot exhaust off the Northern Border Pipeline compression stations with three units in North Dakota, three units in South Dakota, and one in both Montana and Minnesota for a total generating capacity of 44 MW; 22 MW went commercial in 2006, 22 MW went commercial by the end of 2009. The generation is environmentally benign, using virtually no additional fuel and producing virtually zero emissions. Basin Electric has signed a 25-year contract with the developer for the output of the REGs.

8. NextEra Wind: Basin Electric purchases all of the energy from six wind projects owned and operated by NextEra. The wind projects include:
    a. Edgeley Wind Project: 40 MW wind facility near Edgeley, North Dakota. Wind Facility went commercial in 2003. Basin Electric has entered into a 25 year PPA for the power from this facility.
    b. Hyde County Wind Project: 40 MW wind facility near Highmore, South Dakota. Wind Facility went commercial in 2003. Basin Electric has entered into a 25 year PPA for the power from this facility.
    c. Wilton 1 Wind Project: 49.5 MW wind facility near Wilton, North Dakota. The Wilton 1 Wind Project went commercial in early 2006. Basin Electric has entered into 25 year PPAs for the power from this facility.

d. Wilton 2 Wind Project: 49.5 MW wind facilities near Wilton, North Dakota. The Wilton 2 Wind Project went commercial November 2009. Basin Electric has entered into 25 year PPAs for the power from this facility.
e. Day County Wind Project: 99 MW wind facility near Aberdeen, South Dakota. Wind Facility went commercial in 2010. Basin Electric has entered into a 30 year PPA for the power from this facility.
f. Baldwin Wind Project: 100 MW wind facility near Baldwin, North Dakota. Wind Facility went commercial in 2011. Basin Electric has entered into a 30 year PPA for the power from this facility.

9. Tri-State Sheridan-Johnson: Basin Electric has a power purchase arrangement with Tri-State to serve a portion of its member obligations in northeast Wyoming's Sheridan and Johnson counties. Under this agreement Basin Electric receives 11 MW to 13 MW varying on a monthly basis. The agreement extends through December 31, 2025 and maybe extended for up to two successive terms of five consecutive years.

10. Tri-State Nebraska Allocation: The Tri-State Nebraska Allocation is a power allocation from the Western Area Power Administration – Rocky Mountain Region. This allocation provides for fixed monthly capacity and energy deliveries that correspond to the monthly resource capability of the Federal hydro systems. The load for Tri-State Nebraska members is split between the east and the west electrical interconnections. For planning purposes, Basin Electric and Western have agreed to split the amount of Contracted Rates of Delivery (CROD) between the east and west electrical interconnections. As a result, the planned power program shows the minimum Tri-State Nebraska CROD delivered west of the electrical separation, and the balance between the maximum CROD as delivered east of the electrical separation. The CROD under the federal power deliveries for Tri-State Nebraska reaches the maximum CROD of 83 MW for the summer season in July. However, as a system, Basin Electric's maximum west side member load obligations may occur in either July or August. For prudent planning, Basin Electric assumes the maximum member load as indicated by the Load Forecast as occurring in July, but uses the August CROD of 73 MW. The winter CROD at the point of delivery is 49 MW. The Basin Electric west side planning numbers are a summer value of 27 MW and a winter value of 10 MW. Basin Electric uses these allocations to the extent possible, as peaking resources due to the limited amount of energy that can be scheduled to maximize the value of these allocations. Effective October 1, 2014 the seasonal energy and CROD for future winter and summer seasons may be reduced by up to 1 percent from the then current seasonal energy and CROD.

11. PRECorp Allocation: The PRECorp Allocation is a power allocation from the Western Area Power Administration – Rocky Mountain Region (RMR). The RMR allocation provides for fixed monthly capacity and energy deliveries that correspond to the monthly resource capability of the Federal hydro systems. The PRECorp Allocation uses 24 MW in the winter season and 21 MW in the summer season for planning purposes. Basin Electric uses these allocations to the extent possible, as peaking resources due to the limited amount of energy that can be scheduled to maximize the value of these allocations. Effective October 1, 2014 the seasonal energy and CROD for future winter and summer seasons may be reduced by up to 1 percent from the then current seasonal energy and CROD.

12. Municipal Energy Agency of Nebraska: Basin Electric has signed a contract with Municipal Energy Agency of Nebraska (MEAN) to purchase 30 MW of Mid-Continent Energy Marketers Association Schedule Q, Mid-Continent Area Power Pool Product K: System Participation Power Interchange Service. The purchase began May 1, 2007 and the contract goes through April 30, 2014. All capacity and energy from MEAN is deemed delivered at the Cooper Nuclear Station bus.

13. Webster City CT: Basin Electric has signed a contract with Corn Belt Power Cooperative, a member of Basin Electric, to purchase the output of the Webster City CT peaking plant (20.8 MW) that is fueled by fuel oil. The purchase begins September 1, 2009 and continues through the term of the Wholesale Power Contract between Basin Electric and Corn Belt.

14. Estherville Diesel Generators: Basin Electric has signed a contract with Corn Belt Power Cooperative, a member of Basin Electric, to purchase the output from the City of Estherville's six diesel generators (13.0 MW). The purchase begins September 1, 2009 and will remain in effect so long as Corn Belt continues to purchase the output of the diesel generators pursuant to the Wholesale Agreement between Iowa Lakes Electric Cooperative and the City of Estherville, provided that this will not extend through the term of the Wholesale Power Contract between Basin Electric and Corn Belt.

15. Pocahontas Diesel Generators: Basin Electric has signed a contract with Corn Belt Power Cooperative, a member of Basin Electric, to purchase the output from the City of Pocahontas's two diesel generators (3.8 MW). The purchase begins September 1, 2009 and will remain in effect so long as Corn Belt continues to purchase the output of the diesel generators pursuant to the Wholesale Agreement between Iowa Lakes Electric Cooperative and the City of Pocahontas, Iowa, provided that

this will not extend through the term of the Wholesale Power Contract between Basin Electric and Corn Belt.

16. Spencer Combustion Turbine (CT) Generator: Basin Electric has signed a contract with Corn Belt Power Cooperative, a member of Basin Electric, to purchase 10 MW from the City of Spencer 20 MW combustion turbine. The purchase begins September 1, 2009 and will remain in effect so long as Corn Belt continues to purchase the output of the combustion turbine pursuant to Corn Belt being a party to the Spencer Power Purchase Agreement with Spencer Municipal Utilities of the City of Spencer, Iowa, provided that this will not extend through the term of the Wholesale Power Contract between Basin Electric and Corn Belt.

17. Corn Belt Wind: Basin Electric has signed a contract with Corn Belt Power Cooperative, a member of Basin Electric, to purchase the output of Corn Belt's wind projects. The purchase begins September 1, 2009 and continues through the term of the Wholesale Power Contract between Basin Electric and Corn Belt. The wind projects include: 7.3 MW from the Hancock County Wind Project; 16.8 MW from the Crosswind Generators; 10.5 MW from the Lakota Wind Project; and 10.5 MW from the Superior Wind Project.

18. Minnesota Power Purchase: Basin Electric has signed a contract with Minnesota Power to purchase 100 MW from the Clay Boswell Energy Center. This facility is a four unit coal-fired power station with a nameplate capacity of 1,025 MW. It is owned and operated by ALLETE and is located near Cohasset, MN. The PPA ends on April 30, 2020.

Project Justification and Support

The difference in the load forecast plus other obligations (such as non-member sales, losses, and reserves, less Basin Electric's system-wide load management) and existing and committed generating resources along with purchases, define the load and capability of the Basin Electric system which shows the amount of surplus capacity on Basin Electric's system.

Since Basin Electric's member systems reside on both the eastern and western interconnection and there is limited capability in moving power between the systems, Basin Electric further narrows its view on load and capability to the eastern and western systems.

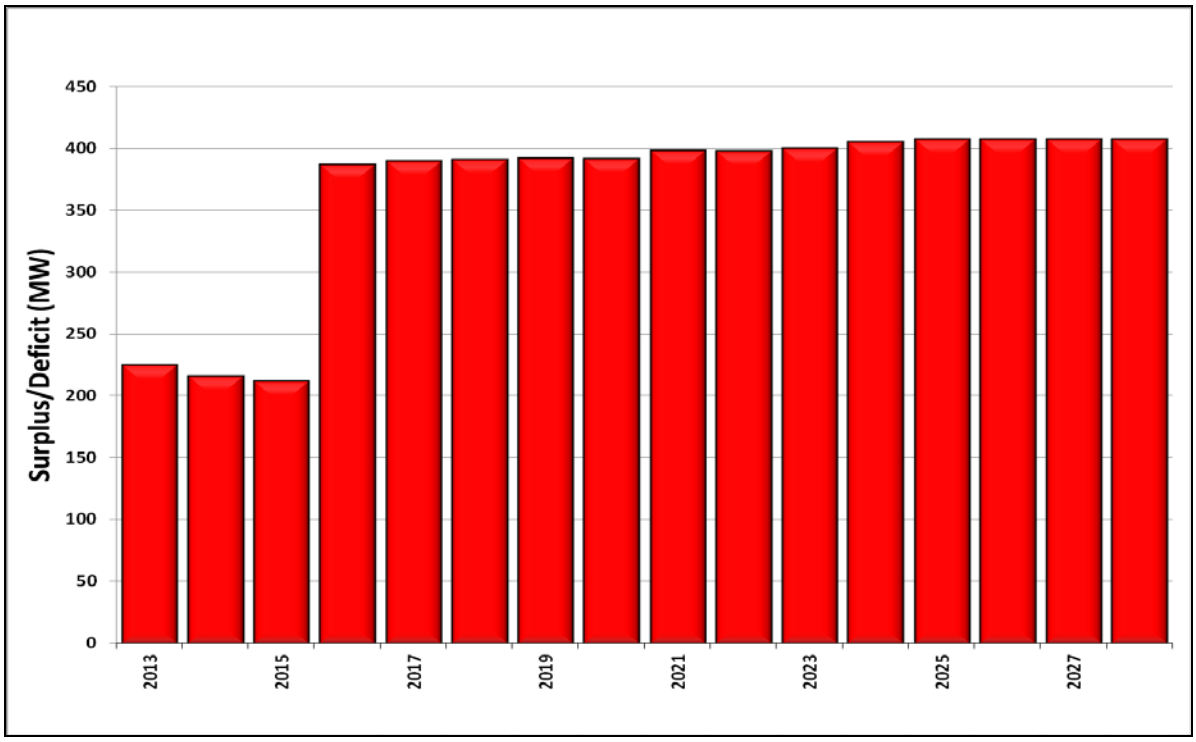


Figure 1. West System Surplus Capacity

Figure 1 shows Basin Electric's western system summer season surplus capacity. The western system does not show a deficit throughout the study period.

Basin Electric has access to alternating current (AC) to direct current (DC) ties to move power between the eastern and western systems. Transfers utilizing these DC ties are not incorporated into the graph and would allow Basin Electric to move surplus west-side generation to the east up to the capability and rights to the ties, which is currently 240 MW in a west-to-east direction.

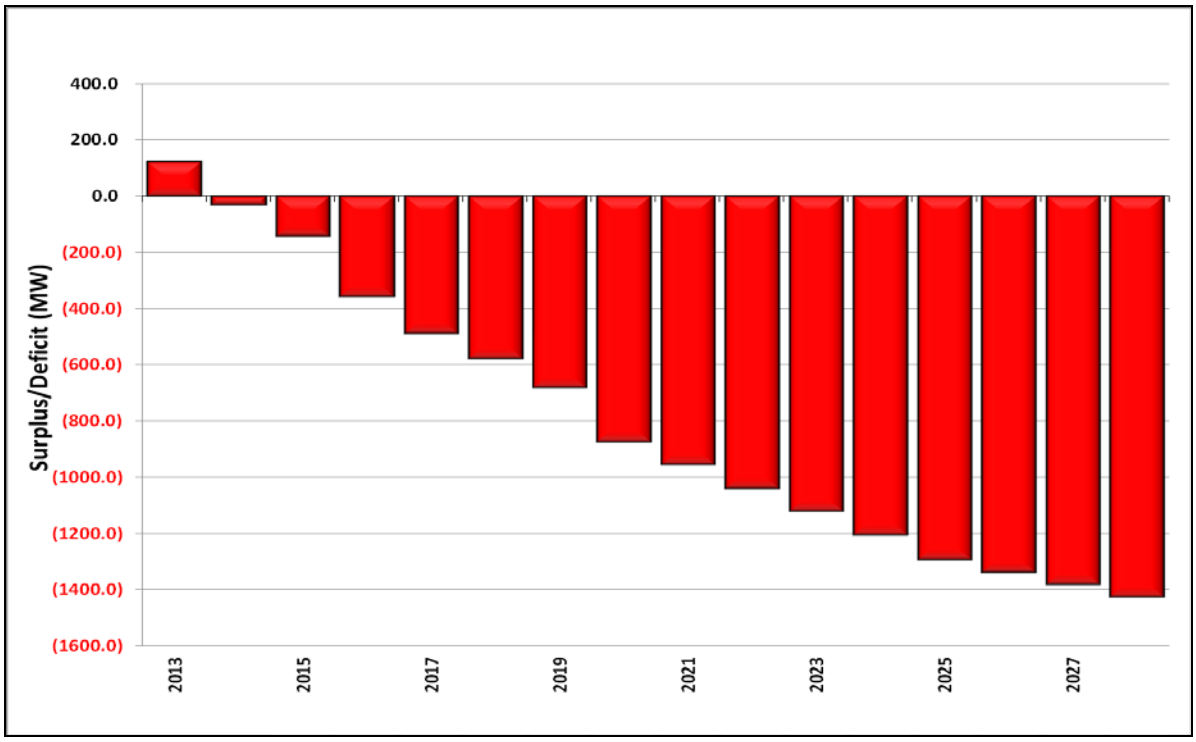


Figure 2. East System Summer Surplus

Figure 2 shows Basin Electric's eastern system summer season surplus capacity. Basin Electric's eastern system is shown to be in a deficit of 28 MW in 2014. This deficit is forecasted to grow more deficit year over year. This graph does not include potential transfers across available direct current (DC) ties - the Rapid City DC Tie or the Stegall DC Tie - to transfer power in either direction.

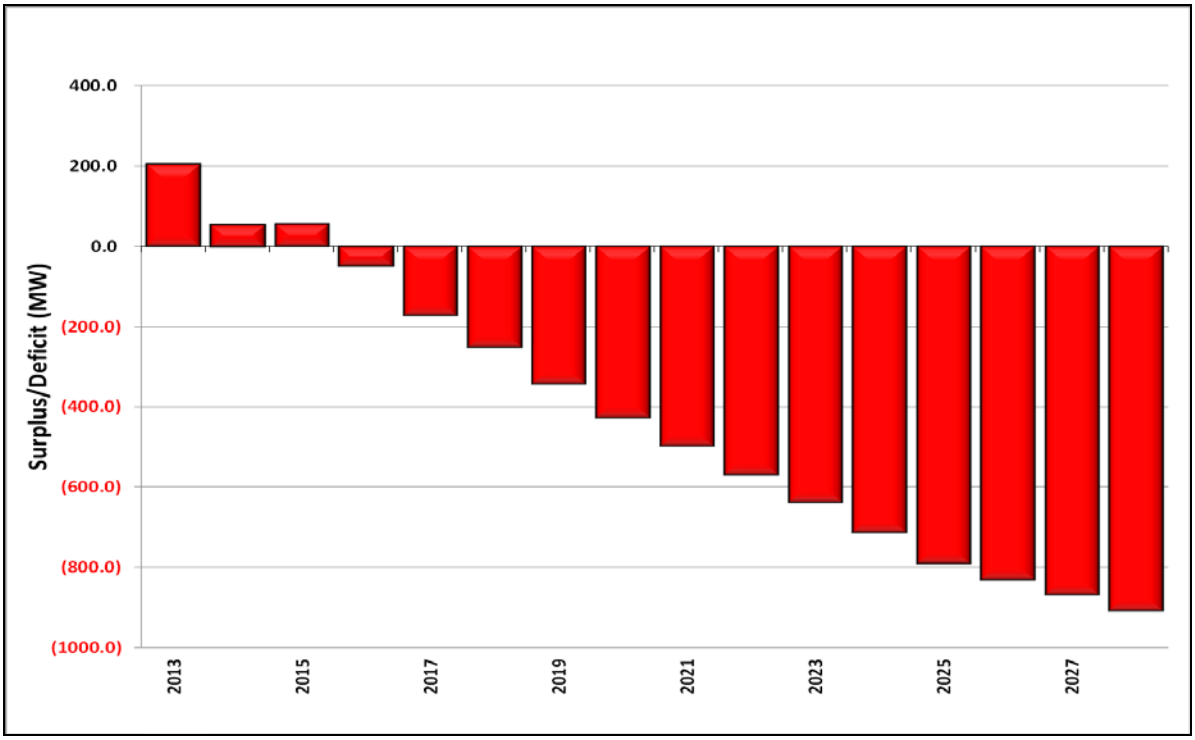


Figure 3. IS (WAUE) System Surplus Capacity

Basin Electric's eastern system can be broken into three areas, the Integrated System (IS), the Southwest Power Pool (SPP) and the Midwest Independent Transmission System Operator (MISO). Figure 3 shows Basin Electric's IS (WAUE) system. The IS is a transmission partnership between Western Area Power Administration (WAPA), Basin Electric and Heartland Consumer Power District (HCPD). This is the portion of the eastern system showing the greatest growth over the forecasted period. This area encompasses the oil developing region known as the Williston Basin. This graph does include anticipated transfers across direct current (DC) ties; the Rapid City DC Tie and the Stegall DC Tie; to transfer power from the west to the east. The graph shows the IS (WAUE) to be deficit 48 MW in 2016. This deficit is forecasted to grow more deficit year over year, to 172 MW by 2017 and 905 MW the end of the forecast period.

If the DC Tie transfers are unavailable, or there is no surplus on the west to move east, the IS (WAUE) would show a deficit of 166 MW in 2014 and this deficit would continue to grow year over year.

The high voltage transmission system into the Williston Basin area is very close to its maximum load-serving capacity, in that the load-serving ability of the area may be impacted until additional transmission facilities are built to bring power into the region or Basin Electric has the ability to start generation

located within the area. Currently Basin Electric is in the process of building a 345-kV high voltage transmission line from Antelope Valley Station to Williston to Tioga, scheduled to be completed in 2016. Until that line is completed, the growing load in this area will be constrained by transmission limitations and will limit the amount of load that can be served in the area without the support of local generation.

Basin Electric will need some portion of local generation in 2014 and 2015 to help with transmission reliability issues in the Williston Basin area until the 345-kV high voltage transmission line from Antelope Valley Station to Williston to Tioga will be completed. The local generation will also provide for support during transmission outages with the line in place as well as support if the load with in the area grows faster than is currently forecasted.

APPENDIX C - NOISE STUDY

Sound Assessment Study

Lonesome Creek Station
Basin Electric Power Cooperative

prepared for

USDA Rural Utilities Service

May 2013

Project No. 69029

prepared by

Burns & McDonnell Engineering Company, Inc.
Kansas City, Missouri

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1.0 SUMMARY

Basin Electric Power Cooperative (Basin Electric) is proposing to build a natural gas-fired generating plant in McKenzie County, North Dakota (Project). Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) was contracted to analyze the expected sound impacts from the Project. The site is capable of supporting three units. Basin Electric requested that the noise analysis be performed on a single-unit as well as a three-unit facility.

The objectives of this study were as follows:

- Identify federal, state, and/or local noise ordinances
- Estimate operational noise levels from the generating station and
- Examine the potential effects of the predicted noise levels on the surrounding areas due to operation of the proposed Project

Predictive modeling indicated that the facility will likely increase ambient sound levels in some locations. However, since there are no local or state regulations for noise in McKenzie County, sound levels were compared to Housing and Urban Development (HUD) guidelines. No exceedences of the HUD guideline noise levels are expected from this project.

The following sections describe the study in further detail.

* * * * *

2.0 ACOUSTICAL 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. 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, are what human ears hear and microphones measure.

Sound is physically characterized by amplitude and frequency. The amplitude of sound 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. Less than a 3-dB change in continuous broadband sound is generally considered "not noticeable" to the average listener. A 5-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 deemphasizes 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 C2-1.

Table C2-1 Typical Sound Pressure Levels Associated with Common Sound Sources

Sound Pressure Level (dBA)	Subjective Evaluation	Environment	
		Outdoor	Indoor
140	Deafening	Jet aircraft at 75 feet	
130	Threshold of pain	Jet aircraft during takeoff at a distance of 300 feet	
120	Threshold of feeling	Elevated train	Hard rock band
110		Jet flyover at 1,000 feet	Inside propeller plane
100	Very loud	Power mower, motorcycle at 25 feet, auto horn at 10 feet, crowd sound at football game	
90		Propeller plane flyover at 1,000 feet, noisy urban street	Full symphony or band, food blender, noisy factory
80	Moderately loud	Diesel truck (40 mph) at 50 feet	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 feet, 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.

Sound in the environment is constantly fluctuating; for example, when a car drives by, a dog barks, or a plane passes overhead. Therefore, sound metrics have been developed to quantify fluctuating environmental sound levels. These metrics include the exceedance sound level. The exceedance sound level, L_x, is the sound level exceeded during "x" percent of the sampling period and is also referred to as a statistical sound level. The most common L_x value is L_{eq}.

* * * * *

3.0 APPLICABLE REGULATIONS

The State of North Dakota does not have applicable state-wide noise regulations and has delegated authority to the individual counties and cities. McKenzie County does not have applicable noise regulations. Therefore, because there are no applicable county or state regulations for noise, this project will be compared to HUD guideline noise levels for residential areas. HUD developed formal requirements related specifically to noise in 1971 (23 CFR 772). The noise regulations set forth the exterior noise standards shown in Table C3-1 for new housing construction assisted or supported by HUD. These noise levels are based on the L_{dn} noise level, which applies a 10-dB penalty to the nighttime noise levels. Essentially, the nighttime noise level should be below a L_{eq} of 55 dBA and the daytime noise level should be below a L_{eq} of 65 dBA to meet the HUD standard.

Table C3-1 HUD Site Acceptability Standards

Noise Level, L_{dn} (dBA)	Acceptability
Not exceeding 65	Acceptable
65 to 75	Normally not acceptable
Exceeding 75	Unacceptable

Based on the HUD guidance for new construction, a L_{dn} of 65 dBA would be considered acceptable for the residences and commercial property near the Project. The predicted noise levels from the Project will be compared to the HUD standards.

* * * * *

4.0 PREDICTIVE MODELING

Using industry-accepted sound modeling software, the expected sound-pressure levels were predicted. The program used for determination of noise levels was the Computer Aided Design for Noise Abatement (CadnaA) model, Version 4.3.143, published by DataKustik, Ltd., Munich, Germany. The CadnaA program is a scaled, three-dimensional program which takes into account each piece of sound-emitting equipment on the Project site and predicts future sound-pressure levels over an area of interest. The model calculates sound propagation based on ISO 9613-2:1996, General Method of Calculation. ISO 9613-2 assesses the sound levels based on the Octave Band Center-Frequency range from 31.5 Hz to 8000 Hz. The atmospheric conditions were assumed to be calm, and the temperature and relative humidity were left as the program default values.

The main generation equipment that is expected to be installed for this Project is the General Electric (GE) model LM6000-PF combustion turbine. There are several auxiliary pieces of equipment associated with each combustion turbine package, including two small oil fin-fan coolers, air compressors, water pump skids, and auxiliary equipment skids. There would be natural gas conditioning equipment on site.

The sound profile used for modeling purposes was provided by GE for all of the equipment. The turbine sound data is for LM6000 turbines that use different NO_x control technology (water injection) than will be used for this Project (dry NO_x control). GE documentation indicates that their dry NO_x controls equipment is capable of meeting the same sound levels as their water injection equipment, so estimates from these turbines should be similar to those that are installed. The provided sound power profiles used in the modeling for the Project are shown below in Table C4-1.

Table C4-1 Expected Equipment Sound Profiles

Equipment	Transformer Sound Power Level (Lw) at Octave Band Frequency (Hz) (dBA)									Overall Sound Level (dBA)
	31.5	63	125	250	500	1000	2000	4000	8000	
Auxiliary Skid Cooler	82.0	90.0	92.0	84.0	86.0	86.0	84.0	78.0	72.0	90.4
Filter House Intake & Surface	80.0	81.0	87.0	98.0	87.0	84.0	86.0	79.0	70.0	93.0
Fin Fan	108.0	105.8	102.0	95.0	90.0	90.0	88.0	86.1	76.2	95.8
Gas Filter Skid	107.7	109.0	102.0	99.0	97.0	93.0	90.0	86.0	79.0	99.0
Gas Turbine Enclosure Surfaces	NP	NP	56.0	64.0	67.0	65.0	60.0	54.0	48.0	68.8
Gas Turbine Generator Enclosure Surfaces	NP	90.0	92.0	84.0	86.0	86.0	84.0	78.0	72.0	90.4
Generator Motor & Fan Surfaces	100.0	96.6	100.1	101.8	90.4	90.8	83.5	74.8	64.6	96.4
Intake Silencer Shell	NP	102.0	102.0	91.0	78.0	73.0	71.0	68.0	65.0	88.3
Liquid Fuel Forwarding Skid	91.8	79.9	94.7	102.5	86.3	88.9	87.7	86.1	79.4	96.9
Auxiliary Skid	NP	78.0	83.0	88.0	88.0	84.0	83.0	79.0	73.0	90.1
Stack (includes silencer)	123.0	120.0	107.0	96.0	85.0	80.0	77.0	77.0	79.0	96.9
Transformer	119.9	112.7	104.6	92.1	86.7	77.5	71.3	66.5	61.6	92.5
Turbine Vent Exhaust	103.1	104.7	97.4	94.1	78.9	76.6	75.5	69.5	59.9	88.5
Turbine Vent Motor & Fan Surfaces	100.2	92.9	96.6	98.3	92.4	91.7	93.6	92.4	86.0	99.5

NP – Not Provided by GE.

Noise receivers were placed at ten points near the proposed facility. Six of these locations are current residences, and four are points of commercial developments. See the attached Figure C4-1 for the locations of the modeled sound receivers and the Project as a single unit. Figure C4-2 shows the modeled receivers and the Project as three units.

A moderate ground absorption value was chosen that appropriately reflects the agricultural nature of the area surrounding the Project. The effects of shielding due to terrain were conservatively ignored. Second-order reflections were considered to account for the effects of reflected sound within the power block.

The modeled L_{eq} and L_{dn} sound pressure levels for the nearest residences and commercial properties are shown in Table C4-2. The table presents both the one-unit and three-unit scenarios. The measurement points in the table and figures are labeled “Res” for residence and “Com” for commercial property. The modeled single unit L_{eq} and L_{dn} sound pressure level noise contours are presented in Figure C4-3 and

Figure C4-4, respectively. The three units L_{eq} and L_{dn} sound pressure level noise contours are presented in Figure C4-5 and Figure C4-6, respectively. All of the noise contours are shown in 5 dBA increments.

Table C4-2 Expected Worst-Case L_{eq} and L_{dn} Sound Levels

Receiver	Sound Pressure Level			
	One Unit L_{eq} (dBA)	One Unit L_{dn} (dBA)	Three Units L_{eq} (dBA)	Three Units L_{dn} (dBA)
Res1	26.5	32.9	29.8	36.3
Res2	28.0	34.5	32.0	38.4
Res3	31.8	38.2	35.2	41.6
Res4	23.5	29.9	28.4	34.8
Res5	25.0	31.4	28.9	35.3
Res6	21.9	28.3	25.9	32.3
Com1	32.3	38.7	35.1	41.5
Com2	34.9	41.3	37.5	43.9
Com3	36.3	42.7	39.4	45.8
Com4	38.0	44.4	40.7	47.1

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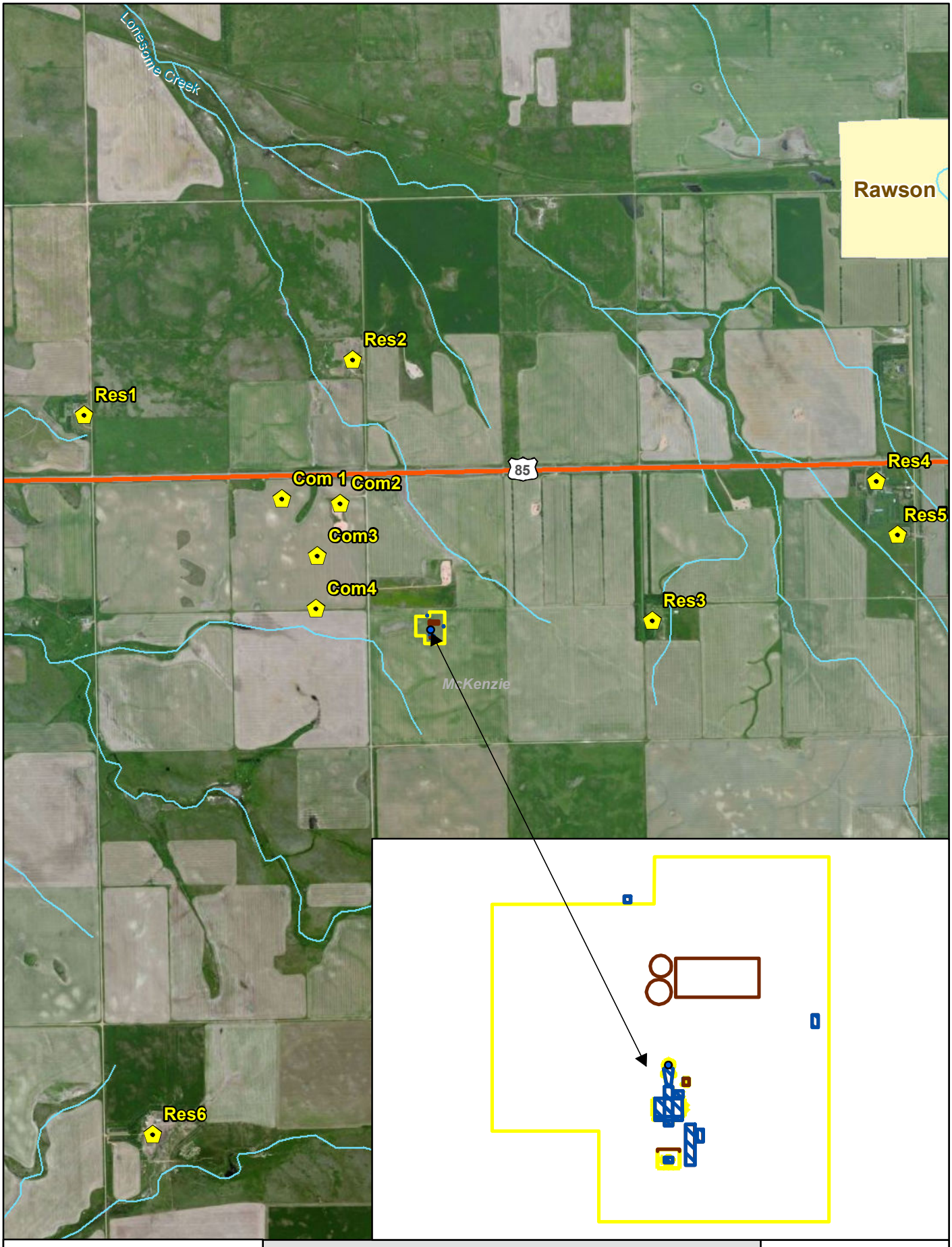

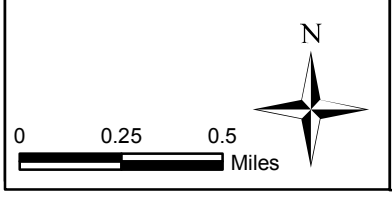

Legend

- Receivers
- Facility
- Structures
- Sources

Figure C4-1:
Lonesome Creek
One Unit
Facility Modeling
Layout and Receivers

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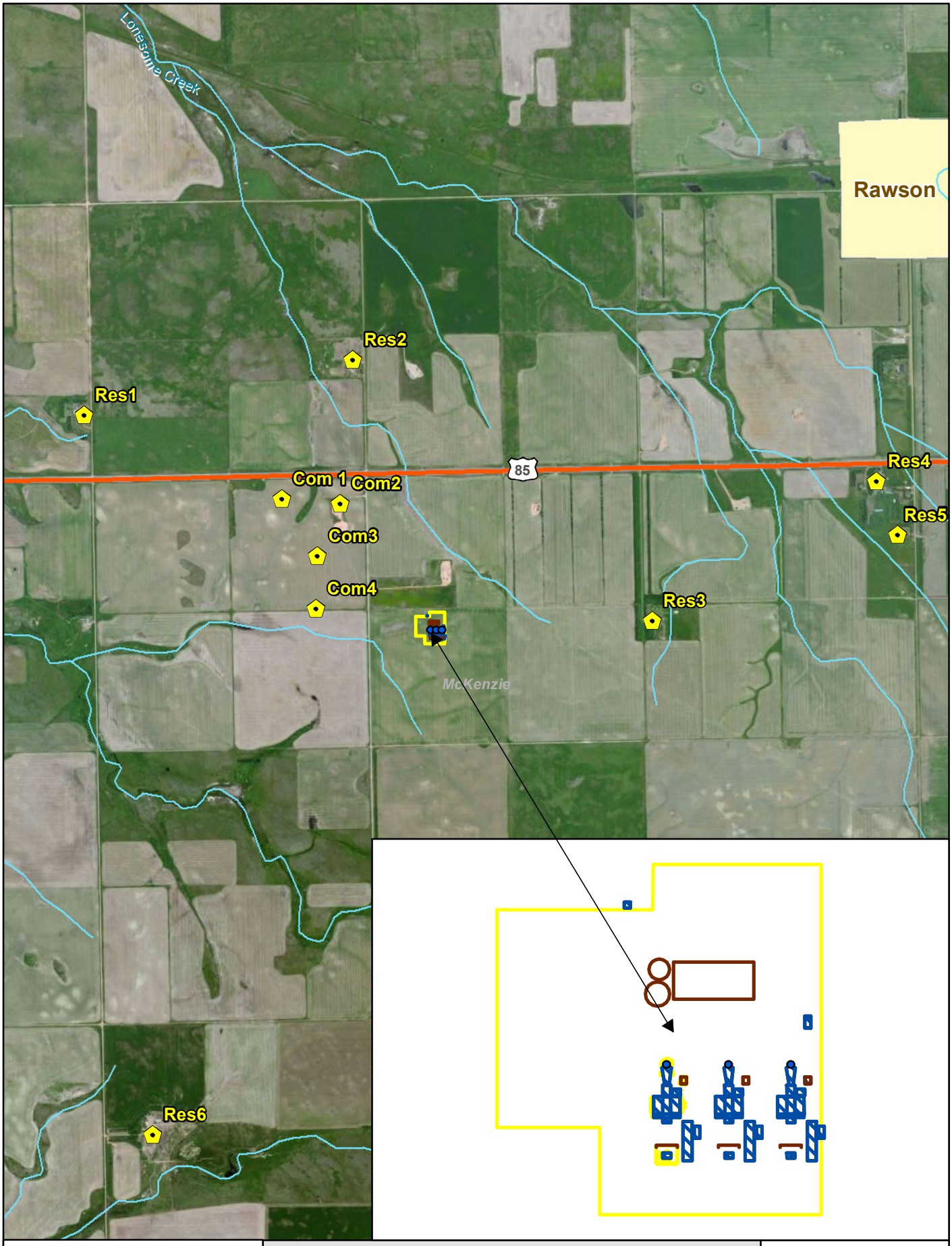

Figure C4-2:
Lonesome Creek
Three Unit
Facility Modeling
Layout and Receivers

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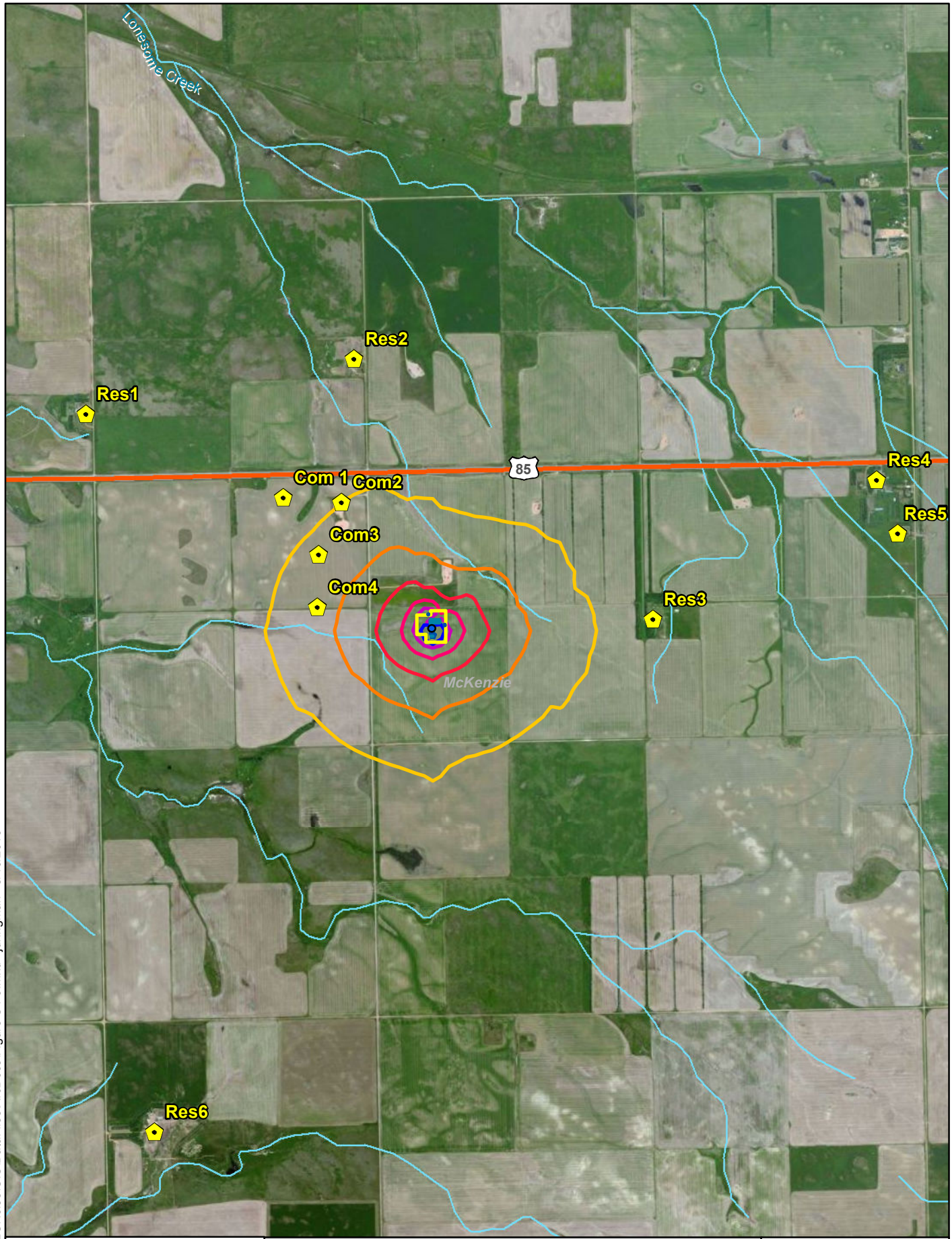

Figure C4-3:
Lonesome Creek
One Unit
Leq Noise Contours

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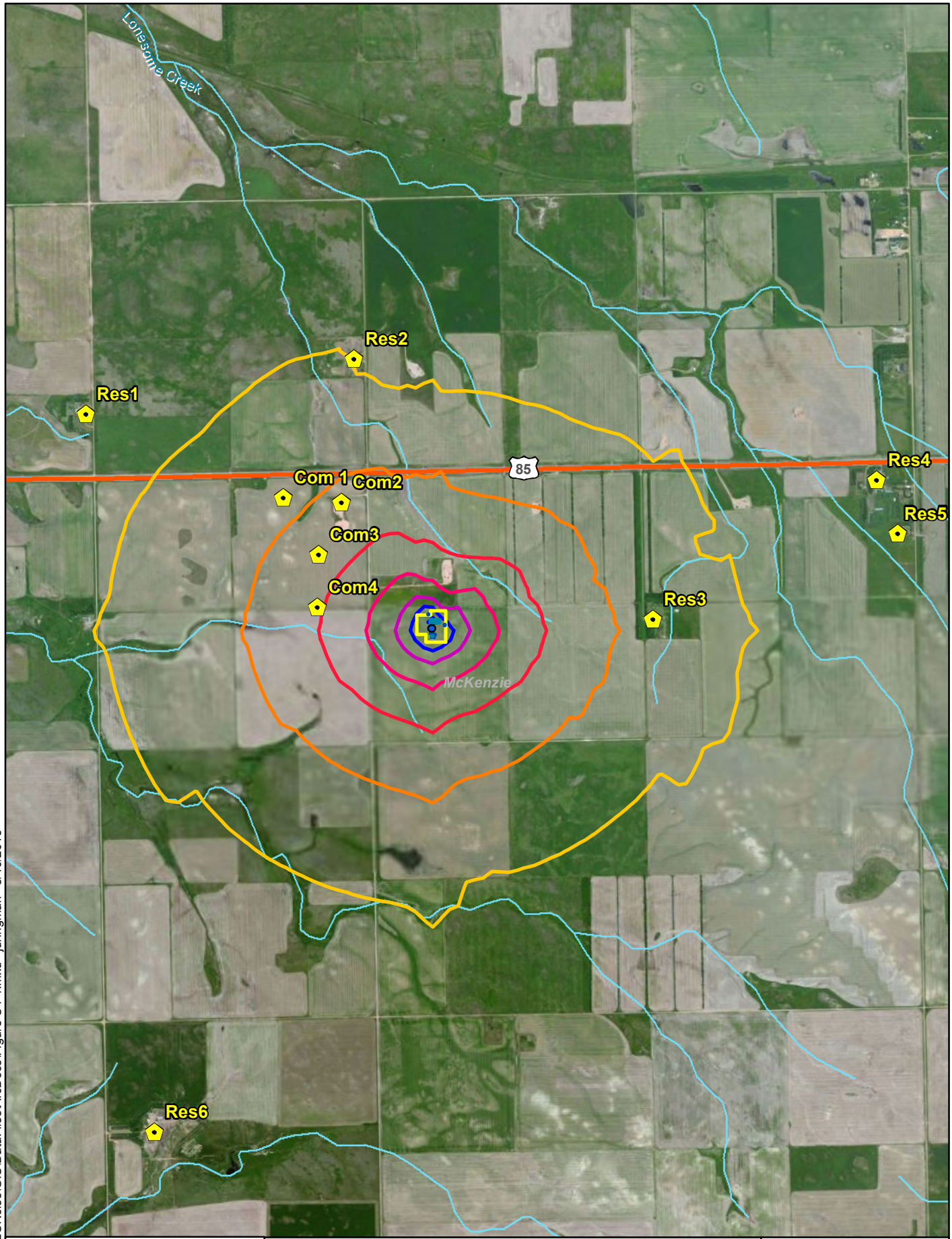

Figure C4-4:
Lonesome Creek
One Unit
Ldn Noise Contours

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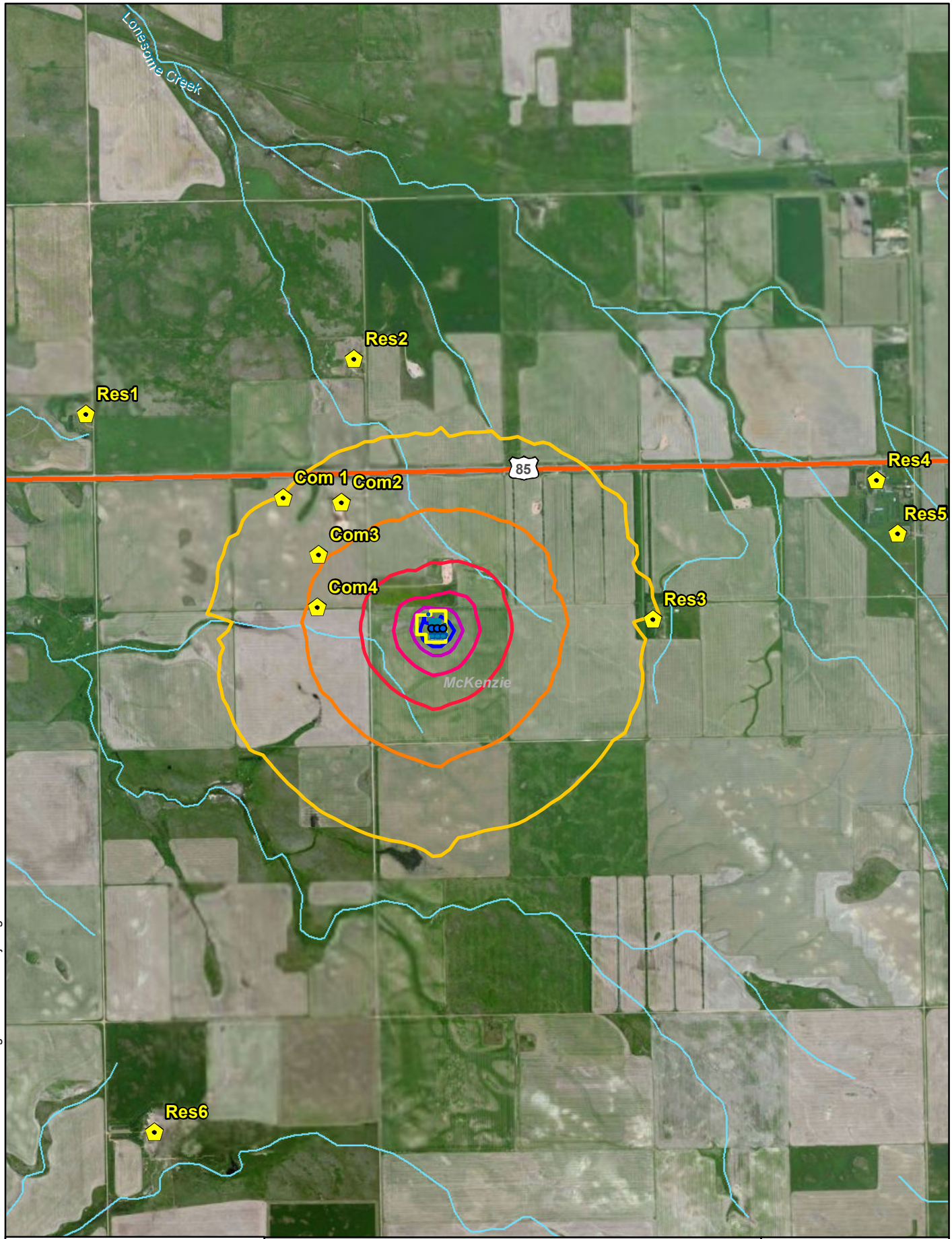

Figure C4-5:
Lonesome Creek
Three Units
Leq Noise Contours

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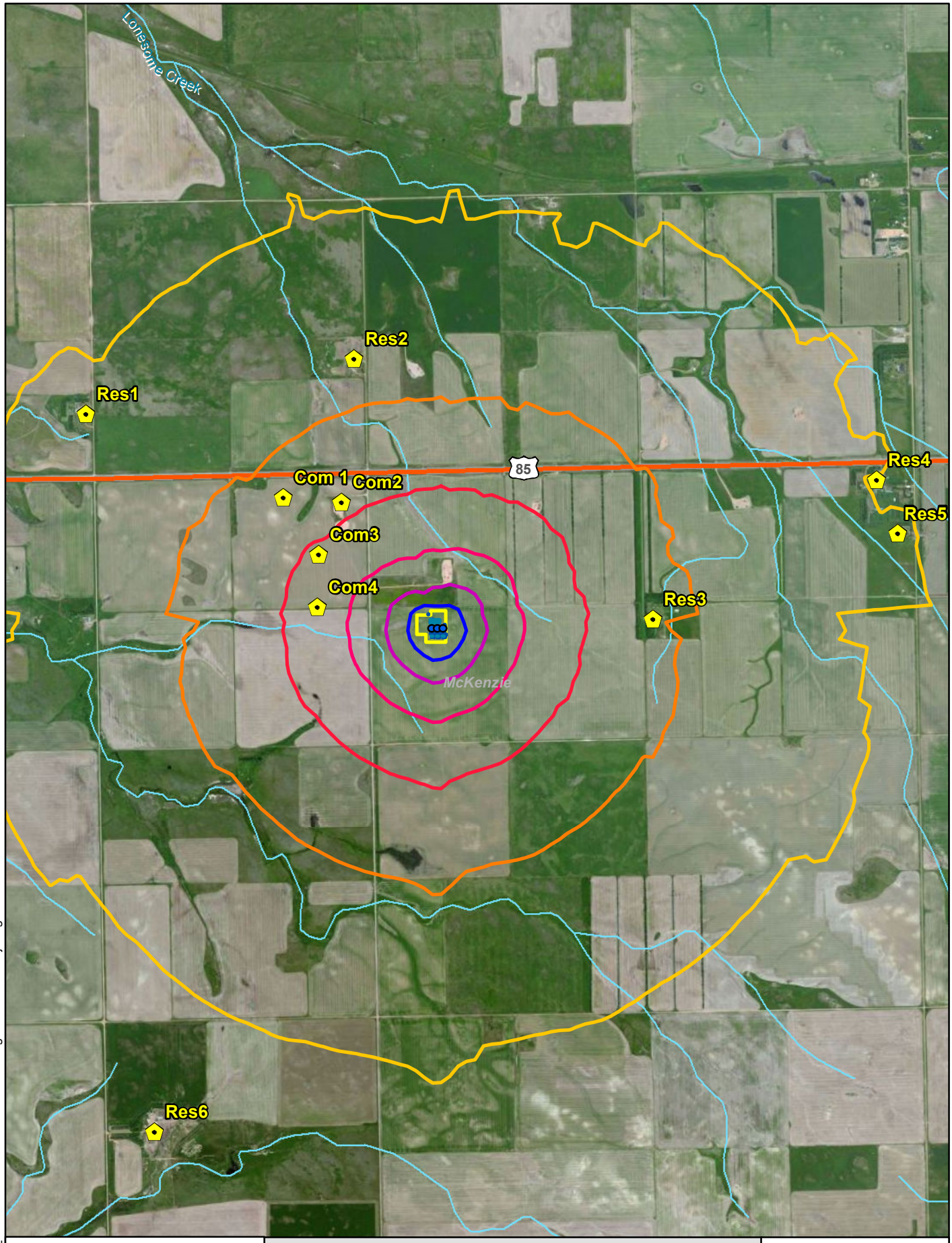

Figure C4-6:
Lonesome Creek
Three Units
Ldn Noise Contours

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5.0 CONCLUSION

The maximum L_{eq} sound level at the closest residence is expected to be 31.8 dBA with only one unit operating. This equates to an L_{dn} sound level of 38.2 dBA, significantly lower than the HUD guideline of 65 dBA for site acceptability. 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 to the inside of a house. 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 the closest residence could reasonably be expected to approach 35.2 dBA. This equates to an L_{dn} sound level of 41.6 dBA, which is again significantly lower than the HUD guideline of 65 dBA for site acceptability. 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 to the inside of a house. Similarly to one unit, noise levels due to operation of three units are expected to have little or no impact on the closest residences.

The maximum L_{eq} sound level at the closest commercial property is expected to be 38.0 dBA with only one unit operating and 40.7 dBA with three units operating. This equates to L_{dn} sound levels of 44.4 dBA and 47.1 dBA, for one unit and three units respectively. Even with three units operating, sound levels remain significantly lower than the HUD guideline of 65 dBA for site acceptability. These sound levels would be considered quiet at a residence, and commercial properties generally have less restrictive limits. Noise levels due to the operation of the facility are not expected to have a significant impact on the closest residences and commercial properties.

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