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July 1, 2018



Mr. Darrell Nitschke
Executive Secretary, Director of Administration
North Dakota Public Service Commission
600 East Boulevard Avenue – State Capitol
Bismarck, ND 58505-0480

Dear Mr. Nitschke:

Enclosed is an original and 10 copies of Great River Energy's (GRE) North Dakota Ten-Year Plan Report, 2018-2027 (Report) to the North Dakota Public Service Commission (Commission) as required by Chapter 49-22-04 of the North Dakota Century Code (NDCC).

In accordance with Chapter 69-06-02-02 of the NDCC, GRE has provided a copy or notice of the Report to the necessary parties.

GRE has included an extra copy of the Report and a self-addressed stamped envelope and requests that the Commission provide GRE with a file stamped copy.

Please contact me at (763) 445-6114 or gpadding@greenergy.com if you have any questions or comments.

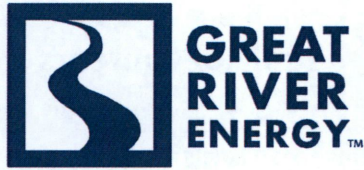
Sincerely,

A handwritten signature in blue ink that reads 'Greg Padden / dm'.

Greg Padden
Director, Resource Planning and Regulatory Affairs
GREAT RIVER ENERGY

Enclosures (11)

c: NDPS (10)
County Auditors (4)
ND State Agencies and Officials (Letters of Confirmation only)



2018-2027 NORTH DAKOTA TEN-YEAR PLAN

Submitted to the
North Dakota Public Utilities Commission
July 1, 2018



INNOVATE, COLLABORATE AND LEAD TO COMPETITIVELY POWER THE FUTURE

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INTRODUCTION

This report was prepared in accordance with the North Dakota Public Service Commission's (Commission) Guidelines (Guidelines) for compliance with the requirements of Chapter 49-22-04 of the North Dakota Century Code.

Great River Energy (GRE) has concluded that some information that would be provided under Sections E and F and Exhibits 1 and 2 pursuant to the Guidelines qualifies as Critical Energy Infrastructure Information (CEII) and, therefore, has not included the information in these pages. GRE offers to provide the information to the Commission upon request.

SECTION A: Owned Energy Conversion Facilities

GRE's power supply portfolio is comprised of coal, refuse-derived fuel (RDF), natural gas, wind purchases, hydro purchases and oil-fired units. The coal-fired units are located at Jamestown and Underwood, North Dakota. Stanton Station, a 189 MW coal-fired generating station located in Stanton, ND, was retired from GRE's portfolio in 2017.

GRE and our members have installed 20 solar installations across Minnesota, including a 250 kilowatt (kW) installation at GRE's Maple Grove, Minnesota headquarters. Nineteen more GRE-owned 20 kW arrays were installed at our member cooperative locations, and nine member sites were expanded to include member community solar projects.

In light of changing energy market forces, GRE is evaluating potential impacts of more flexible operations at our existing baseload coal facilities. Traditionally, these units operated at full capacity most of the time; however, changing market prices are leading to consideration of more flexible level of operations.

Table 1 shows the summer season ratings and location of GRE's owned generating plants. The ratings are Net Dependable Capacity as determined in the North American Electric Reliability Corporation (NERC) Generating Availability Data System (GADS).

Table 1- GRE's Owned Energy Conversion Facilities

Unit Name	Summer Capacity (MW)	Location
Owned Resources		
Arrowhead Emergency Generating Station (Diesel)	n/a	Colvill, MN
Cambridge CT (Peaking)	21.3	Cambridge Township, MN
Cambridge CT2 (Peaking)	153.2	Cambridge Township, MN
Coal Creek Station (Diesel)	3.0	Underwood, ND
Coal Creek Station (Diesel)	3.0	Underwood, ND
Coal Creek Station 1 (Coal)	568.5	Underwood, ND
Coal Creek Station 2 (Coal)	568.1	Underwood, ND
Elk River CT (Peaking)	184.4	Elk River, MN
Elk River Station 1-3 (RDF)	28.9	Elk River, MN
Lakefield (Diesels)	2.0	Trimont, MN
Lakefield Junction (Peaking)	478.6	Trimont, MN
Maple Grove Solar	0.25	Maple Grove, MN
Maple Lake CT (Peaking)	22.2	Maple Lake, MN
Pleasant Valley Station (Peaking)	408.2	Dexter, MN
Rock Lake CT (Peaking)	20.4	Pine City, MN
Spiritwood (Coal, CHP)	81.9	Jamestown, ND
St. Bonifacius CT (Peaking)	48.9	St. Bonifacius, MN

SECTION B: Energy Conversion Facilities Under Construction

No new energy conversion facilities are under construction.

GRE is in the process of deconstructing Stanton Station, with the intent to restore the site to a preindustrial state with native vegetation. All structures, except for the existing switchyard, will be removed to a point at least 2 feet below final site grade. All flat pads will be removed, crushed and used as basement backfill. All asphalt and graveled areas will be removed and used as backfill for the basements. These areas will then be graded to match the surrounding area. The entrance road from Highway 200 will be left in place up to the switchyard. The entrance road will be left in a serviceable condition. An adequate parking area will be maintained at the entrance to the switchyard. Inlets and outlets will be permanently plugged. The existing flume will be filled with large rip rap that blends in with natural river bank. All underground structures (tunnels or pipes) larger than 36" will either be removed, broken open or filled, or backfilled with flowable fill. This should avoid any issues with subsidence in the future.

It is the intent of Great River Energy to donate the existing boat ramp to the City of Stanton. This donation will be made during the spring/summer of 2019. There will need to be legal easements made to allow for road access to the boat ramp and the GRE switch yard.

SECTION C: Proposed Energy Conversion Facilities on Which Construction is Intended Within the Next Five Years

GRE has identified no specific facilities for construction in the next five years in North Dakota. GRE will continue to evaluate future needs as part of our resource planning processes.

SECTION D: Proposed Energy Conversion Facilities on Which Construction is Intended Within the Next 10 Years

GRE has identified no specific facilities for construction in the next 10 years in North Dakota. GRE will continue to evaluate future needs as part of our resource planning processes.

SECTION E: Existing Transmission Facilities (Electric)

GRE has concluded that our existing transmission facilities qualify as Critical Energy Infrastructure Information (CEII). A map of transmission facilities owned and operated by GRE in North Dakota will be made available upon request as noted in Exhibit 1. Summary information for GRE's North Dakota transmission facilities is provided in Table 2.

Table 2 – GRE's Existing Electric Transmission Facilities in North Dakota

Facility	Voltage	AC/DC	Install Year
Stanton – Leland Olds	230	AC	1966
Stanton – McHenry Tap	230	AC	1966
McHenry Tap – McHenry	230	AC	1966
McHenry – Balta	230	AC	1966
Balta – Ramsey	230	AC	1966
Ramsey – Prairie	230	AC	1966
Stanton – Square Butte	230	AC	1966
McHenry Tap – Coal Creek	230	AC	1979
Stanton – Coal Creek	230	AC	1979
Coal Creek – Dickinson, MN	± 400	DC	1978

GRE has rebuilt three segments of the Ramsey-Prairie line based on poor structure strength. In the past year specific structures have been replaced rather than entire line segments. At this time GRE has delayed other segments for two years based on other system needs within GRE. We continue to monitor all of our assets and determine the most appropriate projects. GRE will continue to provide updates in this filing as the project proceeds.

Great River Energy continues down the path of refurbishing the converter stations at both ends of the high-voltage, direct-current (HVDC) line, which delivers power from Coal Creek Station to Minnesota. There is one converter station at Coal Creek Station and the other is Dickinson Station, which is located outside of Buffalo, Minn. Our unique HVDC system is one of the best performing HVDC systems in the world and has been highly reliable ever since it was energized in 1978; however, it is 40 years old, and requires refurbishment. This is one of the largest and most important investments Great River Energy will make between 2016 and 2023.

The refurbishment will include replacing many of the major components in the converter stations at both Coal Creek and Dickinson converter stations. All of the work will take place inside or directly supporting the converter stations, not on the transmission line. The project includes replacing the conversion equipment (valves), controls, cooling towers and smoothing reactors as well as making updates in the DC yards. GRE's existing valves are air-cooled, and will be replaced with water-cooled valves. Water-cooled valves require significantly less equipment, are more efficient and effective for cooling and are utilized on all new HVDC systems that are built today.

GRE is not planning to retire any existing transmission facilities in North Dakota within the next 10 years.

SECTION F: Existing Transmission Facilities (Pipeline)

GRE has a water pipeline and accompanying pumping station located near Coal Creek Station that have been in service since August 1, 1979. GRE concludes that the information qualifies as CEII and has not provided it in this document. However, specific information on the facilities and a map will be provided upon request.

SECTION G: Proposed Transmission Facilities on Which Construction is Intended Within the Next Five Years (Electric)

GRE has identified no specific facilities for construction in the next five years in North Dakota. GRE will continue to evaluate future needs as part of our resource planning processes.

SECTION H: Proposed Transmission Facilities on Which Construction is Intended Within the Next Five Years (Pipeline)

GRE has identified no specific facilities for construction in the next five years in North Dakota. GRE will continue to evaluate future needs as part of our resource planning processes.

SECTION I: Proposed Transmission Facilities on Which Construction is Intended Within the Next 10 Years (Electric and Pipeline)

None beyond those projects identified above in Section G.

SECTION J: Regional Coordination

The electric grid is heavily interconnected and must be evaluated, operated and expanded in a coordinated manner to assure reliability and cost-effectiveness. GRE's transmission planning is closely coordinated with other organizations. GRE is a member of and participates directly in several regional transmission planning entities:

- ▶ The Midcontinent Independent System Operator (MISO), which administers a tariff providing for regional transmission services, energy and ancillary services markets, and resource adequacy requirements. MISO also has responsibilities for regional transmission planning, coordination and expansion. GRE is a transmission owning member and market participant. Further information about MISO is available on-line at www.misoenergy.org. MISO's transmission expansion plans are also available at their web site under the "Planning" tab and contained in the "Transmission Planning Studies and Reports" menu item. The most recent plan is MTEP17 (2017).
- ▶ MISO conducts Sub-regional Planning Meetings (SPMs) to encourage an open and transparent planning process and to provide a forum for coordination and discussion of transmission issues and proposed projects among utilities and other interested stakeholders.
- ▶ The Midwest Reliability Organization (MRO) is a non-profit organization of regional utilities established to develop regional reliability standards and ensure compliance with standards of the North American Electric Reliability Corporation (NERC) as well as its own standards. Further information about MRO is available on-line at www.midwestreliability.org. Further information about NERC can be found at www.nerc.com.

- ▶ The Minnesota Transmission Owners (MTO) group, a consortium of 16 sponsoring utilities and three participating government agencies, fulfills the utilities' statutory obligations for transmission planning in the state of Minnesota. These obligations include the development of the Minnesota Biennial Transmission Plan, as well as studies associated with meeting the Minnesota Renewable Energy Standard (RES) requirements. Further information about the MTO group is available at www.minnelectrans.com.
- ▶ CapX2020, a joint initiative of 11 regional transmission utilities to develop a long-range vision and transmission expansion projects to ensure that load in the region can be served reliably, provide outlet capability for renewable and other generation additions and supports regional reliability of the transmission system. The five CapX2020 projects are energized.

Further information about CapX2020, the proposed projects, and studies are available on-line at www.capx2020.com and www.minnelectrans.com.

Recommended Measures for Regional Coordination:

None beyond the activities described.

SECTION K: Environmental Information

Acid Rain Program. The Acid Rain Program (ARP) under Title IV of the Clean Air Act requires nationwide reductions of sulfur dioxide (SO₂) and nitrogen oxides (NO_x) emissions by allocating allowances under a cap-and-trade mechanism to electric generation facilities for SO₂ emissions based on historic or calculated levels and reducing allowable emission rates for NO_x. Coal Creek and Spiritwood stations, as well as several of GRE's combustion turbine stations, are regulated by the ARP.

Each unit under the ARP is required to hold one SO₂ allowance for each ton of SO₂ emissions on a calendar year basis. The EPA allots a pre-determined number of SO₂ allowances to specified legacy units for each year. Excess allowances from these legacy units can be used for compliance by other affected units in a utility's fleet. Excess allowances can also be sold into the market created by the ARP, however with significant nationwide reductions in SO₂ emissions since the program's inception, the market is virtually non-existent.

GRE's generation units have been performing better than ARP requirements for many years. Therefore, GRE has an excess of SO₂ allowances that guarantees compliance with the program requirements by all its affected units with no additional investment.

The ARP regulations limit NO_x levels at Coal Creek Station to 0.40 lb/MMBtu at each unit. The units operate well within the applicable limits.

Regional Haze. EPA published final regional haze regulations in 1999. The goal of these regulations is to improve visibility in Class I areas, such as national parks and wilderness areas, by gradually reaching "natural conditions" in 2064. The first phase of this rule requires certain power plants to install Best Available Retrofit Technology (BART) to control SO₂, NO_x and particulate matter (PM) emissions. Both units of GRE's Coal Creek Station are BART-eligible units and subject to BART requirements. In December

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2009, North Dakota Department of Health (NDDH) issued its final BART determinations for public comment as part of its regional haze state implementation plan (SIP). These emission controls must be installed and operational no later than five years after EPA approves North Dakota's SIP or finalizes its own federal implementation plan (FIP). EPA's final SIP/FIP determinations for North Dakota were published on April 6, 2012. EPA approved North Dakota's SIP relative to Coal Creek Station with the exception of NO_x. As a result, controls necessary to comply with the approved BART limits were installed by the required deadline of April 2017.

In 2012 EPA also finalized its FIP for Coal Creek Station NO_x emissions. GRE disagreed with EPA's FIP which would have required selective non-catalytic reduction technology. In April 2012 GRE filed a petition for review with the Court of Appeals for the Eighth Circuit. North Dakota also filed a petition with the court. On September 23, 2013 the court vacated EPA's FIP, stating that EPA was arbitrary and capricious in issuing the FIP by not looking at all the factors; in particular, EPA's failure to consider the existing pollution controls. On April 26, 2018, after further review, EPA published its proposed rule to approve NDDH's revised SIP for Coal Creek Station's BART NO_x limit. The public comment period ended May 29, 2018. EPA is reviewing submitted comments; as of June 2018 there has been no further action.

NDDH has started the second round of regional haze reduction analysis. SIPs are due to EPA for approval no later than July 31, 2021. Cost-effective controls and associated visibility improvements will again be determined for all emission sources in the state, with an expected compliance date of no later than five years after EPA's approval of a SIP or finalization of its own FIP.

Mercury and Hazardous Air Pollutants. Since the early 2000s, GRE has been an industry leader in researching mercury reduction technologies at our plants. We worked with Electric Power Research Institute, U.S. Department of Energy, Lignite Research Council and University of North Dakota's Energy & Environmental Research Center, among others, to identify and test novel mercury reduction technologies. As a result of more than a decade of collaborative research, GRE was uniquely positioned to respond to EPA's Mercury and Air Toxics Standards (MATS) rule which became effective in 2015.

Specifically, Coal Creek Station engineers identified a novel scrubber additive to control mercury in conjunction with boiler chemical additives, which was made possible by the reductions from GRE's novel multi-pollutant DryFining™ technology. This research ultimately saved capital costs associated with installing a more traditional activated carbon injection system. These Coal Creek Station emission controls have been working successfully since 2015.

Spiritwood Station installed a carbon injection system and has been using it to comply with the MATS limits.

With respect to other non-mercury pollutants, Coal Creek and Spiritwood stations meet acid gas requirements through inherently low chlorine coal (lignite), and as documented by quarterly emission testing or through surrogate SO₂ monitoring with existing plant monitors. With respect to non-mercury metals, each plant maintains compliance with the particulate matter limit of 0.03 lb/MMBtu through existing highly-efficient particulate controls such as baghouses and electrostatic precipitators.

Carbon Dioxide Emissions. On October 23, 2015 EPA published its final rule for the regulation of carbon dioxide (CO₂) emissions from new, modified and reconstructed power plants. The rule includes separate standards for coal-fired and natural gas-fired units. GRE has no plans to construct new fossil fuel-fired resources or significantly modify its existing sources.

On October 23, 2015 EPA also published its final rule for the regulation of CO₂ emissions from existing sources (known as the Clean Power Plan or CPP). On October 16, 2017, with a new administration in place, EPA published a proposed rule to repeal the CPP. After several time extensions, comments on the proposed repeal were due April 26, 2018. The CPP was being litigated in the U.S. Court of Appeals for the District of Columbia Circuit, and it was widely speculated that the court would issue its opinion before the end of the first quarter of 2018. However, on November 6, 2017 the court placed the litigation in abeyance, where it remains.

On December 28, 2017 EPA published an advance notice of proposed rulemaking (ANPR) requesting comments on what a replacement rule should look like if EPA were to develop such a rule for existing electric generating units. Comments to the ANPR were due February 26, 2018. Great River Energy participated in and supported comments to the ANPR through several industry associations.

GRE continues to follow the regulatory issues regarding greenhouse gas emissions (GHG). We continue to seek and implement opportunities to mitigate GHG emissions from our operations and support GHG mitigation policy. To this end, we worked with the National Enhanced Oil Recovery Initiative and the Carbon Capture Coalition to support increased and extended Section 45Q tax credits for carbon capture and sequestration projects. GRE also participates in a number of studies and initiatives looking at decarbonizing the energy sector through electrification.

Internally, GRE continues to evaluate opportunities for carbon reduction and offsets, and has adopted a plan to reduce exposure to GHG regulation that is measured, responsible, minimizes rate impacts and ensures reliable service. Provisions of the plan include:

- Manage CO₂ emissions to 2005 levels or lower.
- In May 2018, Great River Energy adopted a corporate goal to achieve 50 percent renewable energy for its 20 all-requirements member-owner cooperatives by 2030. This strategy is not expected to have any direct effect on the operations of any other Great River Energy generation facilities. Great River Energy will continue to maintain a diverse portfolio in order to best serve its member-owner cooperatives.
- Meet any future growth with conservation, energy efficiency, renewable energy, natural gas and market purchases.

Through 2017, GRE has reduced its CO₂ emissions by 37 percent compared with 2005 emissions.

Coal Combustion Residuals. GRE has actively pursued beneficial reuse opportunities for the coal combustion products generated at Coal Creek and Spiritwood stations.

As a by-product of coal combustion, GRE generates approximately 500,000 tons of fly ash per year at Coal Creek Station. Historically, fly ash was stored in landfills; however, over the last 21 years GRE has been very successful in finding alternative uses for it. It is primarily used as a partial replacement for cement, which makes the concrete stronger and more durable than concrete made with cement alone. It has also been used in other products. For example, fly ash was used in the backing of the carpet in GRE's headquarters building.

Beneficial use of ash, in lieu of landfilling, avoids cement production, reducing CO₂ emissions in the cement production process. For each ton of fly ash that is used as a cement replacement, greenhouse

gas emissions are estimated to be reduced by approximately 0.8 tons. Since 1998, more than 3.5 million cumulative tons of CO₂ have been avoided through beneficial use of GRE ash.

Spiritwood Station ash is also being used at Coal Creek Station as a cover product.

As demand for Coal Creek Station fly ash continues to be strong, GRE has started to reclaim fly ash from one of its Coal Creek Station landfills. The reclaimed ash is blended with Spiritwood Station ash to build an upstream raise. Utilizing the reclaimed ash blend in this way allows more of Coal Creek Station ash to be sold into the market. Ultimately, once all of the fly ash is removed from the landfill, the property will be reclaimed and restored to its original state as farm land.

Through the beneficial use of ash, GRE also avoids storing the ash in landfills, resulting in cost savings of over \$10 per ton of ash generated. Since 1998, approximately \$46 million in cumulative landfilling costs have been avoided through beneficial use.

In October 2015 a final rule to regulate coal combustion residuals as a non-hazardous waste under Subtitle D of the Resource Conservation and Recovery Act became effective. Known as the Coal Combustion Residuals (CCR) rule, it establishes national regulations for the management and disposal of ash from power plants in landfills and surface impoundments.

Great River Energy supports EPA's decision to designate coal ash as a non-hazardous waste. The 2015 rule provided for enforcement through citizen suits. This enforcement approach had the potential to create inconsistent implementation of the rule. In December 2016 the Water Infrastructure Improvements for the Nation Act was signed into law. The act allows states to submit to EPA, for its review and approval, a state permitting program that regulates the management and disposal of coal combustion residuals. If the state program is approved by EPA, then permitting and primary enforcement will be the responsibility of the state, and it will operate in lieu of EPA's rule. This legislation creates more consistency and facilitates compliance.

GRE's surface impoundment and landfill facilities that are subject to the CCR rule are in compliance with the rule. All of these facilities are located at our North Dakota plant sites. To date, compliance with the CCR rule has not caused significant operational cost increases. Any future landfill expansions would be built to comply with the revised regulations.

Aquatic Life Protection at Cooling Water Intake Structures. Section 316(b) of the Clean Water Act requires that the location, design, construction and capacity of a cooling water intake structure reflect the best available technology for minimizing environmental impact, primarily by reducing the amount of fish that are impinged or entrained at a cooling water intake structure.

The rule applies only to facilities that withdraw at least two million gallons per day of cooling water from "waters of the United States" and use 25 percent or more of the water withdrawn exclusively for cooling purposes. It requires facilities to use one of seven compliance alternatives to reduce impingement, all of which are considered equivalent to or better than a national performance standard based on "modified traveling screens" with fish returns. The rule applies to Coal Creek Station and GRE's Minnesota-based Elk River Station.

GRE continues to engage the relevant regulatory agencies on this topic and expects that compliance dates for these facilities will occur five or more years out.

SECTION L: Projected Demand for Service

Projected Demand. GRE's forecasted peak demands and energy requirements are provided in Exhibit 3.

Manner and Extent of Meeting Projected Demand. In addition to GRE's current generation capacity, GRE has entered into transactions of various types and durations with other utilities, which help utilize GRE's resources more efficiently. GRE is a full transmission and market participant of the Midcontinent Independent System Operator (MISO). MISO operates the short term energy and ancillary services markets that provide economic dispatch of generation and transmission congestion management over a broad region, and administers resource adequacy requirements to ensure that there is sufficient capacity available to meet expected demand requirements within its footprint.

Given the current forecast of future demand and energy over the next 10 years, GRE does not project the need for new generation resources to address peak demand on our system. GRE has executed agreements to acquire additional wind power energy beginning in 2020 and 2021.

GRE intends to continue to evaluate improvements to existing facilities, biomass and other non-wind renewables, combined heat and power projects, and energy storage (both utility-side and customer-side).

Load Centers. The service areas of GRE's 28 member-owners, shown in Figure 1 on page 15, are located mainly in Minnesota, with a small number in Wisconsin. Twenty of the member cooperatives are All-Requirements customers. Eight member cooperatives purchase a fixed amount of capacity and associated energy from GRE and meet their growth with purchases from other energy suppliers.

Fuel Sources and Transportation. Coal Creek Station's generating units burn beneficiated lignite that is mined at the adjacent Falkirk Mine and transported to the plant via trucks and conveyor belts where it is beneficiated via GRE's DryFining™ technology.

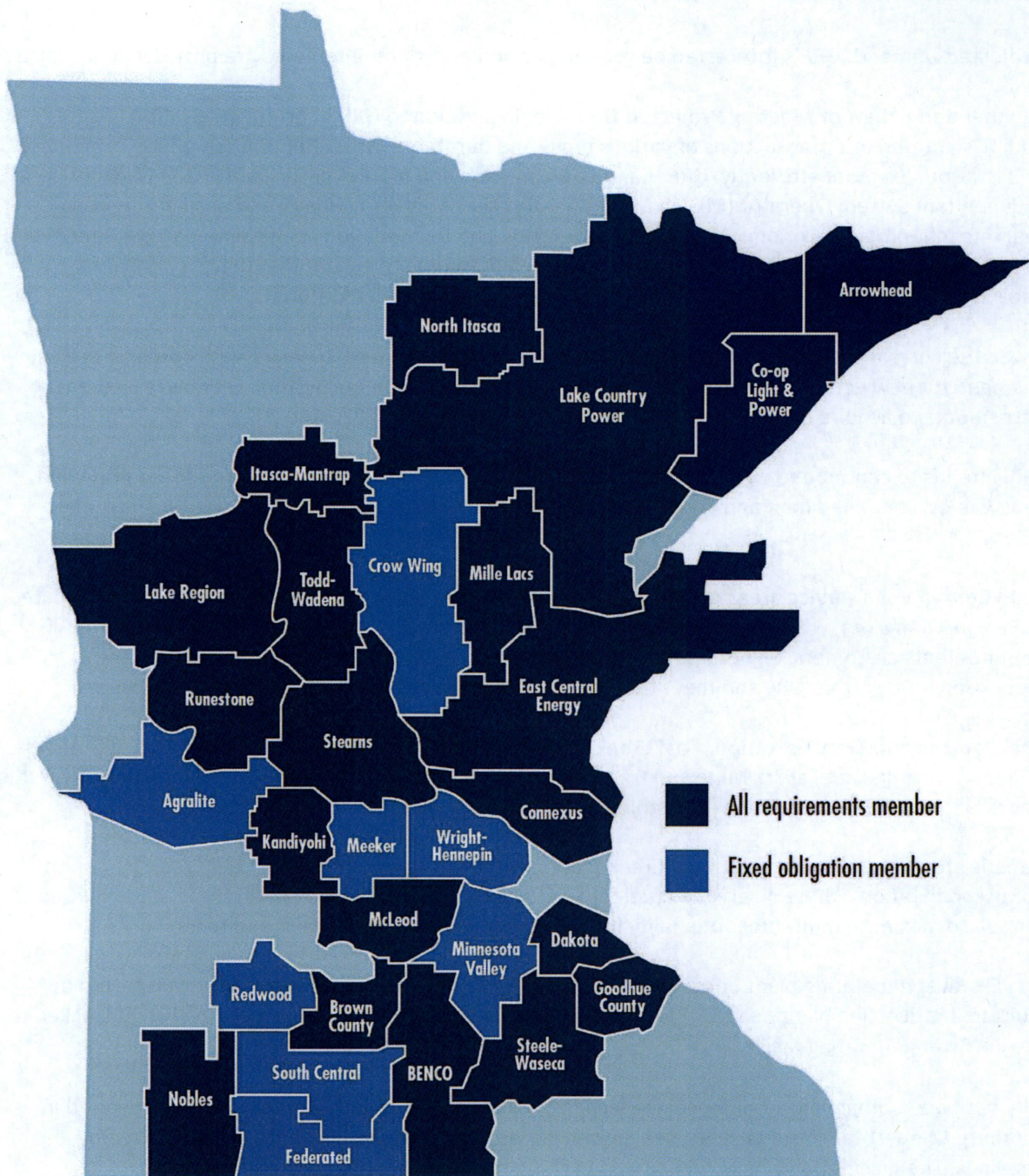
Beneficiated Lignite produced at Coal Creek Station is transported via rail from Coal Creek Station to Spiritwood Station, where it serves as fuel for that facility. GRE is also using natural gas at Spiritwood Station to maximize multi-fuel optionality for the purpose of both economics and reliability.

The Elk River generating plant burns refuse-derived fuel (RDF). Municipal wastes are transported by truck to a processing plant near Elk River where they are converted to usable fuel. The RDF is trucked to the Elk River generating facility.

GRE has two combustion turbine peaking facilities (Pleasant Valley and Lakefield Junction) located in southern Minnesota. These facilities use natural gas as their primary fuel which is transported by pipelines. The facilities also have fuel oil as a back-up fuel, which is transported by truck.

GRE has six combustion turbine peaking facilities (Cambridge I, Cambridge II, Rock Lake, Maple Lake, St. Bonifacius, and Elk River Peaking Station) located in central Minnesota. Cambridge II is fueled with natural gas. The Elk River Peaking Station can use either natural gas or fuel oil. The remaining facilities use fuel oil, which is transported by truck. St. Bonifacius is also connected to a fuel oil pipeline, which adds a fuel transport option.

Figure 1: GRE's Members and Service Areas



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Exhibit 1

U.S. Department of Energy Form EIA-923

(Forms supplied upon request.)

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Exhibit 2

Federal Energy Regulatory Commission Form FERC-714

(Forms supplied on request.)

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Exhibit 3

GRE North Dakota Transmission Map

(Map supplied upon request.)

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Exhibit 4

Location of the Coal Creek Station Water Intake Pipeline

(Map supplied upon request.)

Exhibit 5

Projected Load Growth and Forecast Methodology

The forecasts shown below are econometric forecasts developed for GRE’s 20 All Requirement Members plus fixed amounts of capacity and energy for the eight Fixed Members. GRE’s Fixed Members purchase their growth requirements from suppliers other than GRE. These forecasts were developed in the winter of 2013, and updated in June of 2016. In addition to GRE’s member system’s demand and energy, the forecasts include transmission losses and GRE’s own use.

The following figures show GRE’s most current energy and demand forecasts from 2018 through 2027.

GRE Energy Forecast 2018-2027

Year	50/50 All Requirement	Elk River	DC Line Losses	Transmission	Alliant Load	Fixed Member	Dakota Spirit Ag	Energy
	Member Forecast(=)	Municipal (-)*	(+)*	Losses (+)*	Southern Coops	Requirements	(+)*	Requirement
	(MWh)	(MWh)	(MWh)	(MWh)	Forecasts	(+)*	(+)*	(MWh)
					(+)*	(MWh)	(MWh)	
2018	9,810,188	0	559,055	544,156	0	2,240,576	41,600	13,195,574
2019	9,993,809	(290,930)	559,055	539,233	0	2,238,487	41,600	13,081,255
2020	10,199,357	(290,930)	560,637	548,773	0	2,244,933	41,600	13,304,372
2021	10,439,129	(290,930)	559,055	557,717	0	2,203,913	41,600	13,510,484
2022	10,612,996	(290,930)	559,055	565,522	0	2,203,478	41,600	13,691,721
2023	10,805,646	(290,930)	559,055	574,099	0	2,201,445	41,600	13,890,916
2024	10,982,521	(290,930)	560,637	582,216	0	2,204,931	41,600	14,080,975
2025	11,161,503	(290,930)	559,055	598,311	182,190	2,201,445	41,600	14,453,175
2026	11,348,846	(290,930)	559,055	606,742	182,190	2,201,445	41,600	14,648,949
2027	11,570,747	(290,930)	559,055	616,727	182,190	2,201,445	41,600	14,880,836

GRE Demand Forecast 2018-2027

Year	50/50 All Requirement	Elk River	DC Line Losses	Transmission	Alliant Load	Fixed Member	Dakota Spirit Ag	Coincident
	Member Forecast(=)	Municipal (-)*	(+)*	Losses (+)*	Southern Coops	Requirements	(+)*	Peak Demand
	(MW)	(MW)	(MW)	(MW)	Forecasts	(+)*	(MW)	Requirement
					(+)*	(MW)		(MW)
2018	1,833	0	77	104	0	468	6	2,489
2019	1,861	(70)	77	102	0	468	6	2,445
2020	1,893	(70)	77	103	0	468	6	2,477
2021	1,929	(70)	77	105	0	468	6	2,515
2022	1,955	(70)	77	106	0	468	6	2,542
2023	1,985	(70)	77	107	0	468	6	2,572
2024	2,011	(70)	77	109	0	468	6	2,600
2025	2,038	(70)	77	111	27	468	6	2,656
2026	2,066	(70)	77	112	27	468	6	2,685
2027	2,100	(70)	77	114	27	468	6	2,720