THE CITY OF HASTINGS, NEBRASKA

HASTINGS REGIONAL CENTER

COOPERATIVE
INTEGRATED RESOURCE PLAN

Prepared for:
Western Area Power Administration

Prepared by:
The City of Hastings, Nebraska

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TABLE OF CONTENTS

TABLE OF CONTENTS
continued

TABLE OF CONTENTS
continued

1.0 Background Information

As long time customers of the Western Area Power Administration (WAPA), the City of Hastings, Nebraska (Hastings) and the State Building Division, Hastings Regional Center (HRC), have previously completed Conservation and Renewable Energy Plans (C&RE) in accordance with Title II of the Hoover Power Plant Act of 1984.

The Energy Policy Act of 1992 and the WAPA adoption of the Energy Planning and Management Program, requires that all WAPA customer's holding long-term firm power resource commitments complete an Integrated Resource Plan (IRP), in an effort to promote efficient use of electric energy by Western customers. As HRC's distribution system is totally surrounded by and interconnects with Hastings' system, a request was submitted to WAPA in December, 1995 to allow HRC and Hastings to submit a cooperative IRP. Hastings and HRC received authorization from WAPA on January 23, 1996 to file a cooperative IRP including information for both entities. Hastings and HRC submit the following cooperative IRP in accordance with WAPA requirements.

2.0 Profile

2.1 The City of Hastings, Nebraska (Hastings)

Hastings operates a publicly owned, full service municipal utility providing electrical, natural gas, water, sanitary sewer and street lighting service to the city of Hastings, Nebraska and surrounding areas. Hastings has provided at least one utility service since its inception in 1886, when municipal ownership and operation of the water and sewer system began. The electric system began to evolve in the early 1900's, and currently includes a service area of approximately 57 square miles. The natural gas system became publicly owned in 1942.

Today, Hastings provides reliable, economical utility service to nearly 13,325 electric customers, 10,700 natural gas customers and 9,900 water and sewer customers. Power is primarily provided by the locally-owned 76 megawatt (MW) net, coal-fired Gerald T. Whelan Energy Center 1 (WEC 1). Supplementing the WEC 1 are several additional generation facilities. The Whelan Energy Center 2 (WEC 2), a coal-fired 220 net MW generation facility that began commercial operation in 2011, is owned by the Public Power Generation Agency (PPGA) with Hastings having a 35 MW ownership share that is currently partially assigned to two other entities through April 2018. The

Don Henry Power Center (DHPC) is a dual fuel gas turbine which operates on either natural gas or distillate oil. The North Denver Station (NDS) has two dual fuel steam turbine generators which can operate on either natural gas or No. 2 distillate oil. Total 2016 output of Hastings' generation facilities was 170 MW. Hastings also receives 11.4 MW, during peak periods, of WAPA generation. The electrical system had retail sales of nearly 404,184 MWh in 2016 with a peak hour usage of 92.0 MW on July 21, 2016. Wholesale power sales to the SPP Integrated Market accounted for an additional 89,440 MWh in 2016.

Utility operations at Hastings are overseen by an advisory Utility Board that makes recommendations for approval on utility matters to the locally elected City Council. The Utility Board was appointed in May 2017 and replaced a previous Board of Public Works. The Utility Board has five members who are recommended to the City Council by the Mayor. Each year, one board position is up for reappointment or replacement. Utility Board terms are for five years.

In the early years of the electric system, coal was the primary fuel used to fuel the boilers. Natural gas took the place of coal in 1941. With the onset of the energy crisis in the mid 70's, Hastings learned from its gas supplier that natural gas would be phased out as a viable boiler fuel by 1979. This prompted the community decision makers to investigate all available energy options. A study examining all available energy options culminated in a decision to build the 77 MW WEC 1 coal-fired plant east of town, which became operational in 1981. In 2001, Hastings contracted with an outside consulting agency to complete a Power Supply Study, to provide Hastings with the economics of power supply alternatives. As the result of that study, Hastings joined four other utilities in building a 220 MW coal fired plant (WEC 2) at the current WEC 1 plant location east of town. WEC 2 went on line commercially May 1, 2011.

The easing of the natural gas shortage and the resulting ability to again utilize natural gas as a boiler fuel provides a significant amount of unused generation capacity in Hastings. Although the cost of energy generated on natural gas (and backup oil supplies) has historically been at a higher dollar cost than coal, the availability of excess generating capacity has provided operational and financial benefits to Hastings. The availability of excess capacity has allowed for load planning flexibility. As Hastings' peak energy needs have increased, available capacity has existed to meet those needs. The rate payers of Hastings have also benefited from the revenues derived from marketing excess capacity and associated energy to third parties. Hastings is currently experiencing an excess

generation position, and with the building of WEC 2, Hastings will have excess capacity at least until the year 2031 using current growth estimates.

2.2 Hastings Regional Center (HRC)

The Hastings Juvenile Chemical Dependency Program (HJCDP) provides residential substance abuse treatment for adolescent males from the ages of 13 to 18 years. The average length of stay is approximately 3-4 months, and utilizes evidenced based practices including motivational interviewing, various cognitive behavioral therapy approaches, contingency management, medication assisted treatment and Brief Strategic Family Therapy. The Hastings Regional Center is a Joint Commission accredited facility.

The HRC will undergo major revisions to the campus in the next few years. Currently, a new project is underway to relocate the youth from the HJCDP into three new buildings located on a vacant site just to the south of the current Building #3 on the HRC campus. The new buildings will include two housing buildings and one larger building to provide education, treatment and dining services for the youth. The new buildings are planned to be slab on grade, wood framed structures with residential type construction methods that will perform more efficiently than the existing buildings. Following the construction of these new buildings, existing Building #3 will be decommissioned and demolished.

The present electrical system is currently a primary metered system located in the existing boiler plant and is distributed to all the current buildings. The current plan to remove the boiler plant facility and construct new buildings will require an upgrade to the existing electrical distribution system. The State Building Division is currently performing a study to determine if it is financially beneficial to keep the primary system or turn it over to Hastings. The Administration Building and the Chapel currently have a source of heat from the boiler plant and with the scheduled removal of the boiler plant the two facilities will need a new source of heat and cooling. One of the current 309 Task Force projects is to install a new standalone heating and cooling system for the Administration Building and the Chapel. The Administration Building and Chapel are planned to be converted to an HVAC system utilizing geothermal wells. The new HVAC systems of the three new buildings are also planned to be heated and cooled by geothermal wells. With new construction techniques and flexibility in the space layout, the updated facility will be more efficient from an energy, maintenance and staffing perspective. All new construction is anticipated to be completed by May of 2019.

The HRC will also be connected to the Hastings water system within the next year. This will reduce the energy needed to supply water to the campus by reducing the use of the well pumps. The existing wells will no longer provide potable water to the buildings but may be used for watering the green spaces in the future.

3.0 Existing Supply System

3.1.0 Hastings

Hastings' owns and operates three power stations with a combined rated capability of 135 MW's, and is the operator of the WEC 2, 220 MW coal station of which Hastings owns a 35 MW share (total rated generation capability of 170 MW). The capability and fuel mix of the generating capacity at each site is summarized in Table 3-1. The power stations are individually summarized in the following subsections.

Table 3-1
Summary of Hastings Utilities Existing Power Stations

Station & Unit No.	**In-Service Year**	**Primary Fuel**	**Rated Capability MW**
Whelan Energy Center 1	1981	SubBit. Coal	76.0
Whelan Energy Center 2	2011	SubBit. Coal	35.0*
Don Henry Power Center	1972	Natl Gas	18.0
North Denver Station #4	1957	Natl Gas	15.0
North Denver Station #5	1967	Natl Gas	25.0
TOTAL			170.0

Note: SubBit. refers to sub-bituminous, a medium heat content coal.

Note *: Hastings' share is 35 MW of the 220 MW rated plant but a portion of that is assigned through 2018.

3.1.1 Whelan Energy Center 1 (WEC 1)

The WEC 1 is a single-unit coal-fired power station located just east of the City limits, within Adams County. In 1988, Hastings sold a 6.95% participation share of WEC 1 to the Municipal Energy Agency of Nebraska (MEAN) which is approximately 5.3 MW's for the

life of the plant. The WEC 1 station includes a General Electric (GE) turbine-generator with a rated gross output of 83.6 MW, and a tangentially-fired, dry-bottom Combustion Engineering steam generator. The station includes an electrostatic precipitator for capture of fly ash. Cooling water for the station is provided by on-site wells, with a double flow, induced-draft cooling tower.

The WEC 1 station burns low sulfur western coal from the Powder River Basin of Wyoming. Coal is shipped to WEC 1 in unit trains containing approximately 135 railcars.

A continuous emission monitoring system was installed at WEC 1 in 1995. Hastings currently has surplus SO_2 allowances that will allow the unit to operate as a base load unit. The impacts of Title IV of the 1990 Clean Air Act Amendments (CAAA) on the WEC 1 station are further discussed in Section 4.

Hastings currently sells approximately 40,000 tons of coal per year from the WEC 1 coal yard to an ethanol production facility directly across the roadway from the WEC 1 station. This ethanol plant is not a retail electric customer of Hastings.

Hastings has an agreement that started in 2008 with a soy bean processing plant that is approximately ½ mile from the WEC 1 station to sell them approximately 70,000 tons of coal annually. This ethanol plant is currently a retail electric customer of Hastings.

3.1.2 Whelan Energy Center 2 (WEC 2)

On October 25, 2006, the Public Power Generation Agency (PPGA) was formed under the Interlocal Cooperation Agreement Act of the State of Nebraska to construct and operate WEC 2; a 220 MW net coal fired electric generating plant located on property adjacent to the existing WEC 1 facility. The five participant members of PPGA are Heartland Consumers Power District – 80 MW share (HCPD); Municipal Energy Agency of Nebraska – 80 MW share (MEAN); City of Grand Island Utilities – 15 MW share (GI); Nebraska City Utilities – 10 MW share (NCU); and Hastings – 35 MW share. The WEC 2 station includes a GE turbine-generator with a rated gross output of 246 MW, and a Babcock & Wilcox (B&W) wall fired steam boiler. The station includes an electrostatic precipitator to remove fly ash, a scrubber to remove sulfur dioxide, selective catalytic reduction to reduce nitrous oxides, and a baghouse for additional particulate removal, as well as mercury removal controls. WEC 2 is well-positioned to meet many existing and potential future

EPA environmental rules. Cooling water for the station is provided by on-site wells, with a double flow, induced-draft cooling tower.

The WEC 2 station burns low sulfur western coal from the Powder River Basin of Wyoming. Coal is shipped to WEC 2 in unit trains containing approximately 135 railcars.

Hastings has entered into agreements with HCPD and with MEAN for the partial temporary assignment of energy resources from WEC 2 as Hastings did not anticipate needing its entire 35 MW share to meet local load needs during the early years of WEC 2 operation. The following schedule outlines the dates and increments of returning megawatts to Hastings since WEC 2 began commercial operation:

	Hastings Share
May 2011 through April 2013	5 MW
May 2013 through April 2014	10 MW
May 2014 through April 2015	15 MW
May 2015 through April 2016	20 MW
May 2016 through April 2017	25 MW
May 2017 through April 2018	30 MW
May 2018	35 MW

WEC 2 currently participates in the Southwest Power Pool (SPP) Integrated Market (IM). Tenaska Power Services and MEAN are the two Market Participants (MP's) that represent the five owners of WEC 2 in the SPP IM market.

3.1.3 North Denver Station (NDS)

NDS is Hasting's original power station, co-located with utility offices and operational facilities in the north central portion of Hastings. Units 4 and 5 at NDS were installed in 1957 and 1967, respectively, and continue to be operated by Hastings. Boilers for the original generating units 1 through 3 have been removed from the site. The associated turbine-generator #3 has been sold. Turbine #1 and #2 remain retired in place.

The primary fuel at NDS is natural gas, with No. 2 distillate oil currently applied as backup fuel. One distillate fuel oil storage tank is currently on site, with a total capacity of 580,000 gallons.

NDS Unit 4 includes an Allis-Chalmers turbine-generator and a Springfield steam boiler. The capacity of NDS Unit 4 is 15 MW. Turbine inlet temperature and pressure are 900°F and 850 psi, respectively. The Unit 4 condenser is cooled by a once-through water system, drawing water directly from dedicated wells.

NDS Unit 5 includes a GE turbine-generator and a B&W steam boiler. The capacity of NDS Unit 5 is 25 MW. Turbine inlet temperature and pressure are identical to Unit 4. The Unit 5 condenser is cooled by a mechanical draft cooling tower, with water supplied by wells.

At present, Units 4 and 5 are generally only operated for a few weeks in the summer months for testing. They are also available in the SPP IM if market conditions warrant for them to be called upon. There is generally one operator on duty per shift, who also serves as system dispatcher. More operating personnel are generally assigned to the station when WEC 1 is shut down and in summer operating months.

3.1.4 Don Henry Power Center (DHPC)

The DHPC includes a GE Frame 5 combustion turbine generator and an electrical substation located in the southwest portion of Hastings. The capacity of DHPC is 18 MW. Primary fuel for the station is natural gas, with distillate oil as backup fuel. The DHPC site includes two oil storage tanks with a combined capacity of 296,000 gallons.

There is sufficient physical space at the DHPC site for a second Frame 5 or Frame 6 combustion turbine generating unit. Fuel is provided to DHPC from a Tallgrass Interstate Gas Transmission (TIGT) natural gas town border station (formerly Kinder Morgan), a few hundred yards from the DHPC site. The pipeline from the TIGT town border station to DHPC is sufficient to support concurrent operation of two generating units at the site. However, the TIGT supply line is insufficient to support operation of the existing generating capacity at DHPC during peak natural gas usage months in the winter season.

3.1.5 Station Operating Modes and Capacity Factors

The WEC 1 station is on-line most hours of the year, and provides the bulk of electric energy for Hastings' retail customer load. NDS and the DHPC units are generally available for the SPP IM if called upon, however, the NDS units typically operate only several weeks

per year and then, primarily for testing. The DHPC station is available to be called on by the SPP IM when needed. HU also completes a monthly operational test on DHPC. Prior to the SPP IM, with the high price of natural gas it had been more economical for Hastings to purchase energy from outside sources to cover local load rather than operate either NDS or DHPC. In the last few years with the lower natural gas prices and the addition of renewable energy resources in the SPP footprint, it has put downward pressure on the price of energy. Thus, the WEC units have often been dispatched by the SPP IM to minimum operational levels during shoulder months and off peak hours. The NDS and DHPC units have seldom been called upon by SPP due to low alternative energy prices. Table 3-2 summarizes the annual capacity factor of each station for the past five years.

Table 3-2
Annual Capacity Factor of Hastings' Power Stations

Station	Year				
	2012	2013	2014	2015	2016
Whelan Energy Center Unit 1	53.56	64.34	66.18	47.99	50.46
Whelan Energy Center Unit 2	52.27	70.23	57.58	55.17	47.30
North Denver Station (2 units)	0.42	.16	0.12	0.13	0.10
Don Henry Power Station	0.27	0.05	0.03	0.04	0.05

Note 1: Capacity factors based on rated capacity of Table 3-1, and net energy output (NDS and DHPC calculations generally exclude on-site use in months with no gross generation). Capacity factor equals energy generated divided by total hours in the year.
Note 2: Whelan Energy Center Unit 2 began commercial operation on May 1, 2011

3.1.6 Purchase Power Agreement with WAPA

Hastings has a long-term agreement with WAPA that provides capacity and energy to Hastings. The firm capacity provided by WAPA in the summer and winter seasons is summarized in Table 3-3. WAPA reduced Hastings firm capacity by 1.0 percent in 2006. WAPA has the option starting in 2011 to reduce firm capacity by 1.0 percent by providing two years advance notice. WAPA has the further option to reduce Hastings' firm capacity allocation by 5.0 percent for new project use requirements by providing at least five years written notice.

Table 3-3 Firm Capacity Provided to the City of Hastings by WAPA (MW)	
Summer Seasons	11.360
Winter Seasons	6.189
Note: Summer months are defined as May through October.	

Seasonal energy guaranteed to be provided by WAPA under the contract is based on a defined portion of Hastings' system energy requirements. WAPA currently provides approximately 27,509 MWh in the summer season and 19,641 MWh in the winter season (total 47,150 MWh annually).

3.1.7 Historic and Projected Fuel Prices

Fuel prices for each of the existing stations for the past four years are summarized in Table 3-5. Coal fuel prices have steadily increased during this time period, primarily due to increases in rail transportation costs. Natural gas prices increased through 2014 but started decreasing in 2015 and have continued to decline into 2016. Since 2016 prices of natural gas have started moving upwards. According to the Energy Information Administration (EIA) the forecasted natural gas prices will continue to increase thru at least 2020.

Coal and natural gas delivered fuel price forecasts applied are illustrated on Figure 3-1, and detailed in Table 3-4. Hastings rail contract is currently a five year contract that will expire on 12/31/2018. Hastings coal contract currently is a two year contract that will expire on 12/31/18. The 2017 coal cost is lower than 2016 primarily because of favorable coal supply contracts that were obtained from suppliers due to the uncertainty that existed in the coal industry as a result of proposed EPA legislation by the prior political administration. Base coal price forecast according to the ”EIA 2017 Annual Energy Outlook” report is projecting that Western coal prices will increase an average of 0.5% through 2035.

The forecasted values for natural gas prices, shown in Figure 3-1 and Table 3-4, are annual values calculated as the average of projected monthly values. The average annual natural gas delivered price in 2017 is estimated to be about $2.99 per MMBtu.

Table 3-4
Forecasts of Coal and Natural Gas
As-Consumed Fuel Prices

Year	Coal*		Natural Gas**	
	$/MMBtu	Percent Increase	$/MMBtu	Percent Increase
2017	1.445		2.99	
2018	1.488	3.0%	3.40	13.7%
2019	1.515	1.8%	3.96	16.5%
2020	1.553	2.5%	4.50	13.6%
2021	1.582	1.8%	4.39	-2.4%
2022	1.618	2.3%	4.25	-3.2%
2023	1.648	1.9%	4.28	0.7%
2024	1.684	2.2%	4.41	3.0%
2025	1.715	1.9%	4.50	2.0%
2026	1.749	2.0%	4.59	2.0%
2027	1.783	1.9%	4.75	3.5%

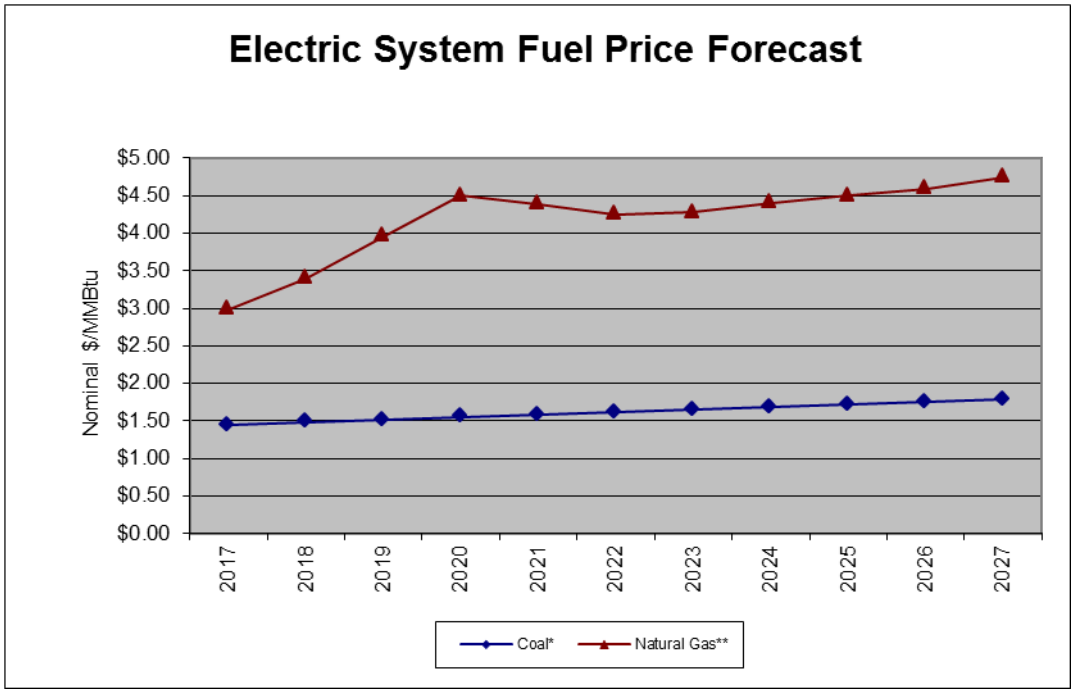
*2017 is based on actual prices through Oct; 2017 is based on coal & rail bids; 2018 - 2027 is using the existing 2017 price and increasing the coal cost by the EIA avg of 0.5% and rail costs by 2.5%
**EIA AEO 2017-2027 forecasted Henry Hub spot price

Table 3-5
Annual Fuel Cost of Hastings' Power Stations ($/MMBtu= $/$10^6$ Btu)

Station	**Year**			
	2013	**2014**	**2015**	**2016**
Whelan Energy Center (2 units)	1.59	1.58	1.56	1.55
North Denver Station (2 units)	3.62	4.54	3.77	3.38
Don Henry Power Center	3.53	4.71	3.96	3.32

Note: Fuel prices are based on higher heating value (HHV). Whelan Energy Center includes both WEC-1 and WEC-2.

Figure 3-1



3.1.8 Physical Assessment of the NDS Generating Units

Units 4 and 5 at NDS were installed in 1957 and 1967, respectively. Both generating units were operated in base-load mode until 1981, when the WEC 1 station became operational. Since that time, the units have been operated intermittently for peaking and replacement power. During this time, the generating units have typically operated several weeks each year. As a result, Units 4 and 5 have been operated the equivalent of approximately 25 and 15 years, respectively.

The general condition of the balance of station equipment for Unit 5 is better than that of Unit 4. This would be expected, as Unit 5 is newer and has fewer operating hours.

3.1.8. a Steam Turbine and Generator

Unit 4 turbine generator was overhauled in 1998. Unit 5 turbine generator was overhauled in 1999. Generator retaining rings were replaced on both units during the overhaul. Both units were found to be in good shape.

3.1.9 Regional Reliability Organizations

In 1996, Hastings became a member of the Mid-Continent Area Power Pool (MAPP). MAPP comprised a multi-state region in the north-central U.S., including the entire state of Nebraska. Membership in MAPP provided Hastings an interface with the larger power suppliers in the region.

The MAPP members operated a wholesale market for the voluntary purchase and sale of electricity at market-based rates, exchanged real-time system cost information, provided maintenance and emergency backup power to each other's power systems, and otherwise coordinated transactions and operation of the regional electric system.

In 2002, MAPP merged its operations with the Midwest Independent Transmission System Operator (MISO). MISO's primary role was to ensure equal access to the transmission systems for all participants and selling transmission service on those lines under FERC tariffs.

With the increasing emphasis on system reliability, MAPP created the Midwest Reliability Organization (MRO) to address those concerns. The MRO is a non-profit organization dedicated to ensuring the reliability of the bulk power system in the North Central part of North America. The primary focus of the MRO is ensuring compliance with regional reliability standards and criteria utilizing open, fair process in the public interest. On January 1, 2005 this organization became operational and replaced the MAPP Regional Reliability Council of the North American Electric Reliability Council (NERC). The MRO membership is comprised of municipal utilities, cooperatives, investor-owned utilities, and a federal power marketing agency, Canadian Corporations, and independent power producers.

Hastings sent written notice to withdraw from MAPP effective April 1, 2009 and Hastings became a transmission customer of the Southwest Power Pool (SPP). SPP is a Regional Transmission Organization (RTO), mandated by the Federal Energy Regulatory Commission (FERC) to ensure reliable supplies of power, adequate transmission infrastructure, and competitive wholesale prices of electricity. As a NERC Regional Entity, SPP oversees compliance enforcement and reliability standards development. The SPP Integrated Marketplace (IM), which went live in 2014, includes a Day-Ahead Market with Transmission Congestion Rights, a Reliability Unit Commitment process, a Real-Time

Balancing Market that replaced the Energy Imbalance Service Market, and the incorporation of price-based Operating Reserve procurement. SPP is currently the Consolidated Balancing Authority (CBA) and will balance supply and demand for the region, maintain frequency, and maintain electricity flows between adjacent BA's. SPP membership is comprised of cooperatives; independent power producers; independent transmission companies; investor-owned utilities; marketers; municipals; and state agencies. Hastings has contracted with a third party, Tenaska Power Services, to represent Hastings as its Market Participant (MP) in the IM.

3.2.0 HRC

3.2.1 WAPA Purchases

The vast majority of energy used at HRC is supplied through its WAPA purchase contract. The WAPA energy is delivered to the Hastings' interconnect with the Nebraska Public Power District (NPPD) and is "wheeled" over Hastings' system to HRC. The Contract Rate of Delivery (CROD) for firm power until October 31, 2015, under the WAPA contract was 790 kW during the Winter Season and 1,433 kW during the summer season. On November 1, 2015, HRC transferred a portion of its allocation to the Nebraska State Penitentiary in Lincoln, Nebraska. The HRC Winter CROD was reduced to 316 kW for the Winter Season and 737 kW for the Summer Season. This reduction in CROD's was adequate to supply peak period to date. The peak electrical demand at HRC during the past three years was in July, 2016, when a daily peak of 651 kW's occurred. The daily CROD totally satisfied this peak day requirement. Peak annual energy use during the past three years occurred during the period of January 2015 through December 2015 when over 2,437 MWH's of power was consumed. Of this amount, all was provided by WAPA.

3.2.2 Generation Facilities

A 750 kW steam powered turbine-driven generator is currently located at HRC. This generator has not been operated for over 25 years. With the major renovations scheduled to occur in the next few years, this steam powered turbine driven generator will be removed when renovations have been completed.

3.2.3 Supplemental Power Purchases

HRC currently has a Supplemental Purchase Power Agreement with Hastings in the event WAPA power delivered is inadequate to supply HRC's entire needs. Due to the direct interconnect with Hastings' system and the excess capacity/energy position of Hastings, supplemental power is readily available at an agreed upon rate if needed by HRC.

4.0 Environmental Considerations

4.1.0 Hastings

This section summarizes the impact of Title IV of the Clean Air Act on existing and future generating capacity owned by Hastings. Also summarized are related proposed regulations that are under consideration.

4.1.1 Title IV NO_x Requirements

Under Title IV of the Clean Air Act Amendments (CAAA) of 1990, all coal-fueled boilers are required to meet specific NO_x emission levels. Under the CAAA regulations, the boiler at WEC 1 qualifies as a "Phase II" boiler, required to meet a NO_x emissions limit of 0.38 lbs/MMBtu as of January 1, 2000. Hastings elected early participation in the Title IV NO_x program, resulting in an emission limit of 0.45 lbs/MMBtu applying until January 1, 2008. The required NO_x emission limit for WEC 1 reduced to 0.38 lbs/MMBtu on that date. WEC 1's NO_x emission rate is well below these requirements. The WEC 1 emission rate in 2016 was 0.173 lbs/MMBtu.

On July 6, 2011, EPA finalized the Cross State Air Pollution Rule (CSAPR) intended to reduce nitrous oxide (NOx) emissions from power plants like WEC 1. Prior to the implementation of CSAPR however, the United States Supreme Court issued a stay that delayed implementation of CSAPR pending additional legal proceedings. If implemented CSAPR would have provided for an annual allocation for NOx emissions for all qualifying generation units. Under CSAPR the WEC 1 allocation for NOx would have been 657.0 tons per year. In 2016 386.2 tons of NOx was emitted. Currently WEC1 is accumulating excess NOx CSAPR allocations in the event the courts determine to implement CSAPR at a future point in time.

4.1.2 Title IV SO_2 Requirements

Title IV of the CAAA includes an SO_2 cap-and-trading program with a goal of eventually reducing annual SO_2 emissions in the U.S. by 10 million tons per year. This is known as the Acid Rain Program. The WEC 1 station falls under Phase II of this program, which affects all generating units producing greater than 25 MW, except some pre-existing combustion turbine units. Beginning in the year 2000, affected units were required to achieve an SO_2 emissions cap based on historical fuel consumption. For each utility system, annual SO_2 emission tonnage allowances have been awarded. These allowances can be applied against the utility's SO_2 emissions; excess allowances can be sold at agreed prices; or banked for use in future years. The allowances awarded and purchased must cover the SO_2 emissions of all affected generating units on the utility's system in future years, including new units added in the future.

Hastings' annual SO_2 allowance for years 2010 and forward is 2,338 tons. As background information, Table 4-1 summarizes the tons of SO_2 and rate of emissions at WEC 1 in 2010 thru 2016.

On July 6, 2011, EPA finalized the Cross State Air Pollution Rule (CSAPR) intended to reduce sulfur dioxide (SO2) emissions from power plants like WEC 1. Prior to the implementation of CSAPR however, the United States Supreme Court issued a stay that delayed implementation of CSAPR pending additional legal proceedings. If implemented CSAPR would have provided for an annual allocation for SO2 emissions for all qualifying generation units. Under CSAPR the WEC 1 allocation for SO2 would have been 1783.0 Tons per year. In 2016 1511.4 tons of SO2 was emitted. Currently WEC1 is accumulating excess SO2 CSAPR allocations in the event the courts determine to implement CSAPR at a future point in time.

The No. 2 Diesel Fuel burned at the North Denver Station and Don Henry Power Center does not produce levels of SO_2 emissions that are significant in comparison to the Hastings system capacity. All No. 2 Diesel Fuel currently purchased by Hastings is Ultra Low Sulfur Diesel (Sulfur content of 0.005% or less).

Table 4-1 SO_2 Tons Emitted and Rate of Emission at WEC 1		
Year	**Annual Tons SO_2**	**Average lbs Per MMBtu**
2010	2300.7	0.809
2011	2419.5	0.856
2012	1586.8	0.697
2013	1439.1	0.550
2014	2301.5	0.800
2015	1494.5	0.716
2016	1579.3	0.706

4.1.3 Title V Requirements

The major provisions of Title V of the CAAA required that each state develop an EPA approved program to administer the provisions of the CAAA. Each utility subject to the CAAA is required to develop a compliance plan to address allowance allocations, permit conditions, continuous emission monitoring systems design and installation, and other requirements of the CAAA. Each utility is also required to operate in compliance with an EPA or state-issued permit. Provisions of this permit system require that each state program be self-supporting. Therefore, each utility is subject to an annual emission assessment.

Hastings is required to operate under a permit program regulated by the Nebraska Department of Environmental Quality (NDEQ). A WEC 1 Title V Operating Permit has been issued by NDEQ on September 12, 2010. This permit expired on September 12, 2015. A permit renewal application was prepared and sent to NDEQ January 13, 2015. The new permit is pending NDEQ approval. As of May 19, 2017 NDEQ is still processing the permit application.

Annual and Semi Annual Deviation reports are submitted to NDEQ to document compliance with all conditions of the Air Operating Permits.

4.1.4 Mercury and Air Toxics Standard Rule (MATS Rule)

The EPA has enacted the Mercury and Air Toxic Standard Rule (MATS Rule). This rule requires the control of Mercury and other metals deemed as Hazardous Air Pollutants (HAPS). The rule also requires the control of Dioxin and Furan compounds. Control of acid gases such as Hydrochloric and Hydrofluoric Acid (HCl and HF) is also required. Compliance was required by April, 2015. A one year extension was requested and approved by NDEQ. Compliance with the MATS Rule has been ongoing since April, 2016.

The compliance of the HAPS is accomplished by limiting the emissions of particulate matter (PM). Currently, the operation of WEC 1 utilizing the Electro-Static-Precipitator (ESP) meets the required limits for PM and thus HAPS. A PM Continuous Emission Monitor (PM CEM) was installed to document regulatory compliance. The PM CEM equipment has worked well.

The compliance for Mercury requires the injection of activated carbon. The activated carbon captures the mercury from within the gas stream. The activated carbon along with the mercury is removed from the gas stream by the ESP.

A Mercury Continuous Emission Monitor (Hg CEM) has been installed to document regulatory compliance. This Hg CEM equipment has worked well.

The ability to reuse the fly ash as a concrete additive or as soil stabilizer with the addition of the activated carbon and mercury has not had any detrimental effects. The fly ash produced by WEC1 continues to meet the required material specifications for beneficial reuse.

The compliance with Dioxin and Furan compounds is accomplished by insuring proper burning of the coal. The compliance requires periodic maintenance and tuning of the burners. Maintenance and inspections activities are documented to provide evidence of regulatory compliance.

With regards to the control of acid gases, the emission limits for HCl and HF are currently being met by WEC 1. This is due to the high calcium content of the Powder River Basin Coal. Monitoring of the HCl is required to insure that compliance is continuous. An HCl Continuous Emission Monitor (HCl CEM) has been installed and continues to function

well.

4.1.5 WEC 2 Environmental Controls

The Environmental Controls on WEC 2 are State-of-the-Art. WEC 2 used the Best Available Control Technology (BACT). It used a dry scrubber for Sulfur Dioxide (SO2) control, a Selective Catalytic Reduction for Nitrogen Oxide (NOX) control, Activated Carbon Injection (ACI) for mercury removal, a baghouse for particulate removal, and an ESP was installed for ash removal. WEC 2 continues to meet or exceed its air permit requirements. WEC2 has continuous emission monitors for SO2, NOx, CO, CO2, PM, Hg, and Opacity to document regulatory compliance.

4.2.0 HRC

HRC is not currently impacted by requirements of the Clean Air Act.

5.0 Conversion/Demand Side Management Programs

With the low cost of energy historically available in this geographical region and the excess generation currently available, conservation and/or Demand Side Management (DSM) programs have been limited because they are not currently cost effective. Even so, Hastings has actively promoted several low cost conservation and DSM options to reduce peak requirements, improve load factors and reduce costs to customers. It is anticipated that if load growth continues and excess capacity diminishes, additional methods of DSM will be employed. Following are the highlights of conservation and DSM options currently being utilized.

5.1.0 Hastings

5.1.1 LED Street Light Conversion

In 2015 Hastings started a program for LED street light conversion. To date Hastings has changed out over half of the 5,093 street light fixtures in our system. To date the electrical usage for street lights has dropped by 28%. The LED lights are projected to have a 20 year life in comparison to 5 years for high pressure sodium and mercury vapor street lights. The goal is to have all street light fixtures converted to LED by the end of 2018.

5.1.2 Excess Power Sales

Excess capacity on a local level has been actively marketed since shortly after WEC 1 began commercial operation in 1981, as the capacity of the plant exceeded Hastings' energy needs at the time of construction. Natural gas generation capacity that had been idled by the unavailability of natural gas as a boiler fuel as a result of the energy crisis again became available for use, resulting in additional capacity to be marketed. The improvements of the load factor and generating efficiencies in Hastings' overall system that have resulted have provided significant cost savings to the customers of Hastings. Wholesale energy sales over the years have increased from a level of 1,845 MWH's in 1987 to over 159,308 MWH's in 2001. Wholesale energy sales have since dropped off to 89,440 MWH's in 2016 as a result of the low energy prices in the SPP IM.

5.1.3 Public Information Programs

Hastings has an ongoing program of educating the general public in regard to energy conservation measures. A monthly newsletter is issued to all customers. The newsletter contains miscellaneous items of interest, including various methods of energy conservation and associated cost savings which may result. In addition, Hastings has on staff a full-time employee to answer customer inquiries and provide information in regard to conservation and other energy related issues.

Additionally, all fifth grade students within the Hastings' service area are provided a one month long in-class program "Be an Energy Detective." This program teaches both energy and water conservation with a tie-in to in home measures that the student shares with her/his parents. The "Energy Detective" program provides each student with a kit which includes LED light bulbs and other conservation items to discuss with parents and install within the residence. The program has been offered to an average of 400 students per year for the past eight years.

Commercial and industrial customers are contacted by utility staff to assist in analyzing consumption patterns and histories to determine potential areas of energy/cost savings. Hastings has load analysis equipment available for loan to these customers to help determine various operational changes that may be possible to improve load factors and reduce peak needs.

Hastings has available to customers a computer program capable of assisting customers in making decisions about energy efficient heating and cooling appliances. The program analyses the appliances efficiency ratings and performance capabilities to predict energy costs for a "typical" heating/cooling season.

Hastings also has available to all customers an infrared thermographic scanning camera. Residential customers can have their home evaluated for heat losses. Commercial and Industrial customers can have their business inspected to evaluate the mechanical integrity of their business. With this service the customer will receive a report showing heat losses and where there could be potential problems with equipment.

5.1.4 Customer Energy Incentive Plan

In 1994, Hastings implemented a Customer Energy Incentive Plan, which provides monetary payment to customers who install high efficiency heat pumps or other energy saving equipment in their homes. Payment levels to homeowners vary depending upon type of unit installed and various efficiency ratings. During the 23 years of the plan, Hastings has seen significant interest in the incentive plan and has improved its overall load factor as a result, by increasing its winter peak.

Hastings has also partnered with an Industrial Assessment Center (IAC) through the University of Nebraska at Lincoln school of engineering (and previously Iowa State University). The IAC group does extensive assessments of energy usage in mid to large size manufacturers in order to evaluate the facility's energy usage and recommend various energy savings measures to reduce overall energy consumption. The assessments are provided at no cost to the manufacturers. The program is funded by the Department of Energy.

5.1.5 Interruptible Irrigation Load

Hastings offers irrigation customers a financial incentive in the form of lower rates in return for their willingness to "interrupt" electrical service during peak load requirement periods. This rate restricts taking electric power for purposes of irrigation from Monday through Friday during the hours of 10:00 p.m. to 10:00 a.m. when the National Weather Service forecasts temperatures to reach 95 degrees and above.

5.1.6 Alternate Powering for Water Wells

Hastings currently has seventeen independent water wells in service to provide for all water needs of the community. Traditionally, electric motors were utilized as the primary power source for all wells. As the highest demand for water coincides with the hottest weather of the year and peak electrical needs, electric water well motors contribute to peak loads. Diesel back up has been installed on three of the wells. Hastings is currently reviewing the possibility of utilizing natural gas fuel as another alternative. Also, when new wells are constructed on the Hastings' system the viability of natural gas will be fully analyzed on a case by case basis as the primary fuel source.

5.1.7 Miscellaneous System Efficiency Enhancements

Hastings has a 115 kV "loop" which totally surrounds the city. This has significantly enhanced reliability for a number of the larger industrial customers in the community. In addition, Hastings is moving towards a direct step down from 115 kV to 13.8 kV. This direct step down avoids double transformation and saves energy. Hastings has finished its project to install capacitor banks for power factor correction on distribution feeders.

5.2.0 HRC

5.2.1 Energy Efficient Heat and Air Conditioning

One of the projects HRC has proposed is to install a new standalone heating and cooling system for the Administration Building and the Chapel. The Administration Building and Chapel are planned to be converted to an HVAC system utilizing geothermal wells. The new HVAC systems of the three new buildings are also planned to be heated and cooled by geothermal wells.

5.2.2 Water supply

The HRC will be connected to the Hastings water system within the next year. This will reduce the energy needed to supply water to the campus by reducing the use of the well pumps. The existing wells will no longer provide potable water to the buildings but may be used for watering the green spaces in the future.

6.0 Recent and Projected Load Growth

This section discusses historical and projected retail customer energy sales and peak demand growth on the Hastings and HRC electric system. A mid-range peak demand forecast was provided by Hastings. A range of system peak demand growth was then applied along with an associated range of system retail sales growth.

6.1.0 Historical Retail Sales and Peak Demand - Hastings

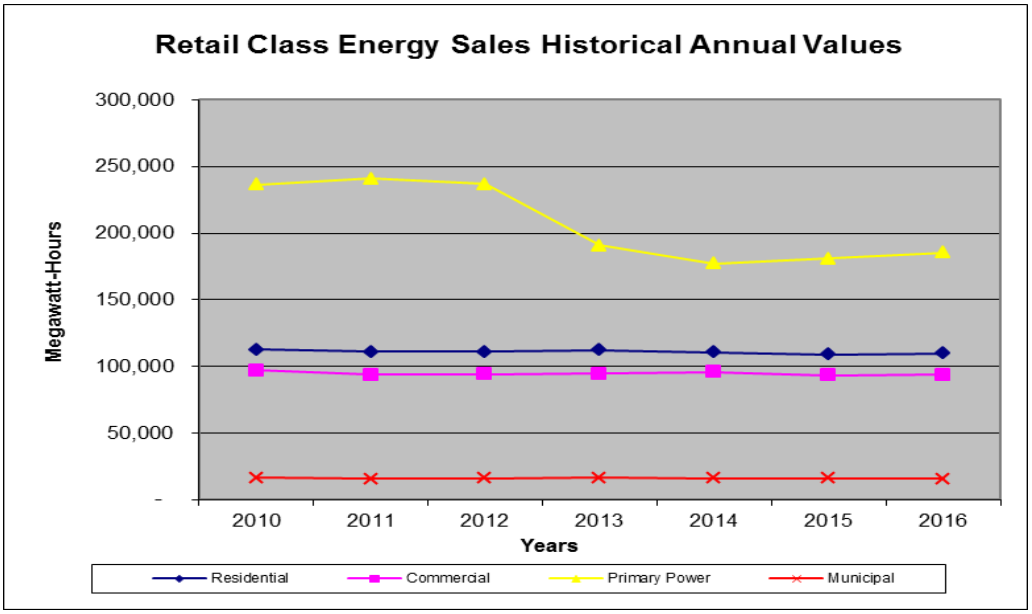
Annual retail sales of each primary customer class are illustrated for the past seven years in Figure 6-1. Based on the average of the last two years, the breakout of total sales by customer classes is as follows:

- Residential: 27 percent
- Commercial: 23 percent
- Primary Power: 46 percent*
- Municipal: 4 percent**

*Includes Primary Power and Irrigation customer classes

**Includes Street Lighting, Traffic, Public Authorities, and Interdepartmental

Figure 6-1



Historical annual peak demands are shown for years 2009 through August 2016 in

Since 2011 the growth rates for all customer classes have actually declined in most classes until 2016 which shows a small growth in the total system. Growth rates for each customer class and for the overall electric system are summarized in Table 6-1. Also shown for comparison are winter season peak demands for the past five calendar years. The demand growth rates are summarized in Table 6-2.

Figure 6-2

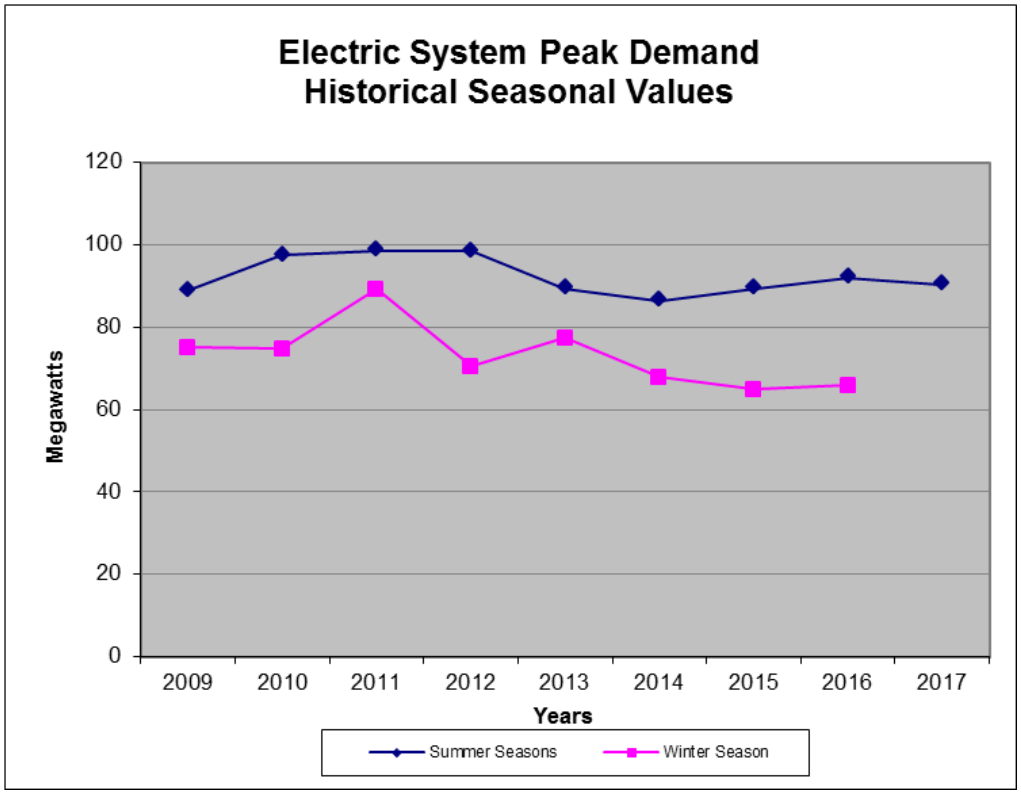


Figure 6-2. The annual peak demands consistently occur in the summer months.

Table 6-1
Summary of Recent Class and System Energy Sales Growth

Years	Annual Growth Rate (Percent)				
	Residential	**Commercial**	**Primary Power**	**Municipal**	**System**
2011-14	-0.4	-0.9	-6.6	-0.3	-3.5
2015	-1.5	-2.8	2.1	-1.1	-0.2
2016	0.9	0.4	2.6	-1.8	1.4

Table 6-2
Summary of Recent System Peak Demand Growth

Years	Annual Growth Rate (Percent)	
	Summer (Annual)	**Winter**
2011-2014	-2.9 avg.	-1.0 avg.
2015	3.4	-4.6
2016	3.0	1.7

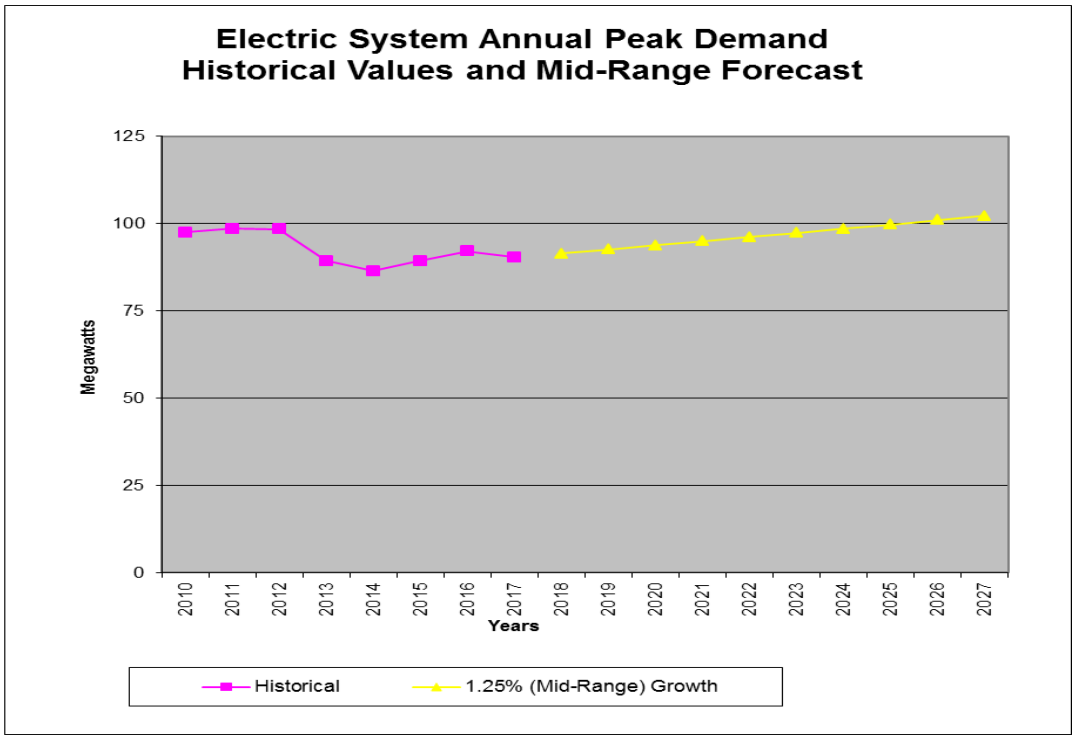
Note: Winter growth rates based on calendar year data.

Peak demand from 2011 to 2016 has fluctuated by year but overall has decreased by approximately 1.0 percent per year. Comparing information in Tables 6-1 and 6-2, we see that peak demand has declined until 2015 which shows for the first time in four years that the peak demand grew slightly.

6.1.1 Forecasts of Peak Demand Growth

Hastings uses a 1.25 percent annual peak demand growth rate for the Hastings electric system. Annual forecast values resulting by applying this growth rate to the actual 2016 peak demand of 92.0 MW are illustrated in Figure 6-3, along with the historical values. These demand growth values are applied as the Mid-Range growth forecast in this Study.

Figure 6-3



6.1.2 Forecasts of Retail Energy Sales

A mid-range forecast of energy sales was derived from the mid-range peak demand forecast and recent system load characteristics. This methodology implies that the customer classes would grow at similar rates in future years.

The following equation details the electric system parameters applied to develop forecasts of energy forecasts:

- Annual Energy Requirements = Peak Demand x Annual Hours x Load Factor

- Annual Energy Sales = Energy Requirements x (100 - Percent System Losses)/100

From the above equations, the direct relationship between peak demand and energy sales can be expressed as follows:

- Annual Energy Sales = Peak Demand x Annual Hours x Load Factor x (100 - Percent Losses)/100

Load factor and system energy losses on the Hastings electric system were evaluated to discern trends over the past several years. Historical values for these parameters on the Hastings system in 2011 through 2016 are summarized in Table 6-4.

The average percentage energy losses for the Hastings transmission and distribution system over the six year period has been 3.2 percent. This is a relatively low percentage for an electric system, and reflects the fact that generation is located close to the load centers on the Hastings electric system.

Annual system load factors for the five year period are also shown in Table 6-3. The average load factor from 2011 through 2016 is 53.6 percent.

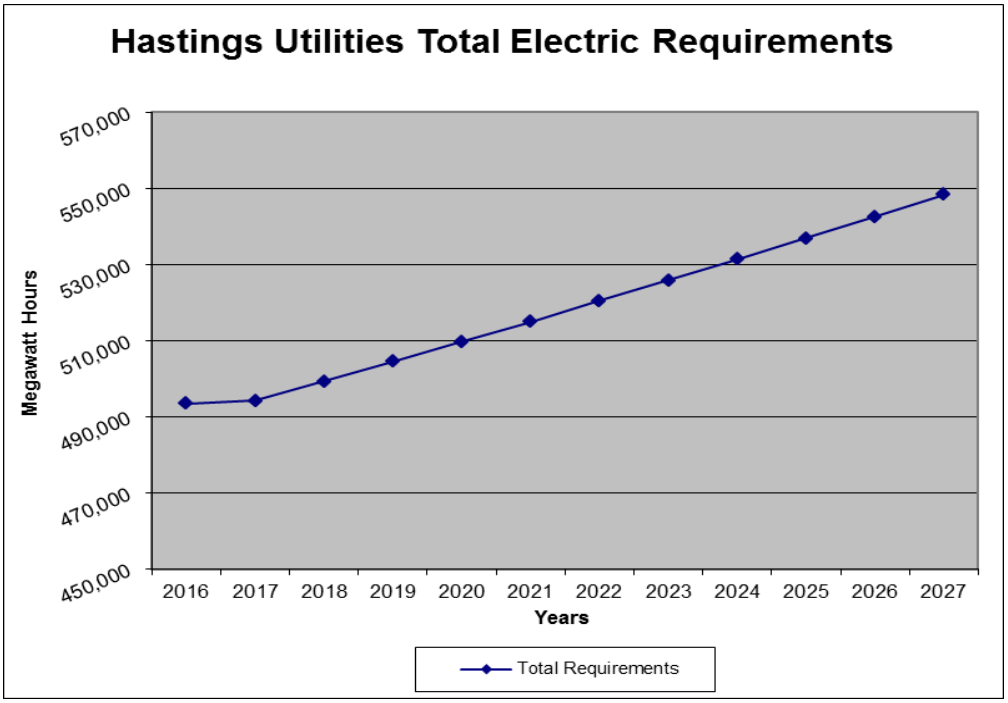
Table 6-3
Recent Electric System Energy Losses and Load Factor

Fiscal Year	Energy Losses Percent	Load Factor Percent
2011	3.2	55.2
2012	3.3	54.7
2013	3.3	54.7
2014	3.5	54.6
2015	3.2	52.6
2016	2.9	51.5
Average	3.2	53.6

When applying this methodology, load factor is assumed to remain constant in future years, and energy sales are assumed to grow at the same rate as the peak demand after 2016. Table 6-4 shows these forecasted energy sales. Figure 6-4 summarizes the energy forecasts.

Table 6-4			
Forecast Range of System Energy Sales Growth			
Annual Energy Sales w/1.25% growth			
Year	Residential sales Mwh's	Wholesale Sales Mwh's	Total Requirements Mwh's
2016	404,174	89,440	493,614
2017	409,226	85,000	494,226
2018	414,342	85,000	499,342
2019	419,521	85,000	504,521
2020	424,765	85,000	509,765
2021	430,074	85,000	515,074
2022	435,450	85,000	520,450
2023	440,893	85,000	525,893
2024	446,405	85,000	531,405
2025	451,985	85,000	536,985
2026	457,634	85,000	542,634
2027	463,355	85,000	548,355

Figure 6-4



6.2.0 Historical Peak Demand - HRC

The peak demand of HRC has been relatively flat during the past three years. Currently, the WAPA summer/winter CROD is more than adequate to handle all electrical needs of HRC.

Electrical usage data for the past three years is as follows:

Peak Electrical Demand	651 KW in July, 2016
Peak Annual Energy Use	2,437,953 KWH (Jan. 2016 – Dec. 2016)
Monthly Energy Use Varied From	142,236 KWH (October, 2015) 295,256 KWH (July, 2015)

6.2.1 Projected Peak Demand – HRC

	TOTAL ANNUAL REQUIREMENT		WAPA - FURNISHED REQUIREMENTS	
YEAR	PEAK DEMAND -KW	TOTAL ENERGY - KWH	PEAK DEMAND -KW	TOTAL ENERGY - KWH
2016	651	2,383,378	727	2,682,000
2017	538	2,105,772	727	2,682,000
2018	550	2,100,000	727	2,682,000
2019	550	2,100,000	727	2,682,000
2020	550	2,100,000	727	2,682,000
2021	550	2,100,000	727	2,682,000
2022	550	2,100,000	727	2,682,000
2023	550	2,100,000	727	2,682,000
2024	550	2,100,000	727	2,682,000
2025	550	2,100,000	727	2,682,000
2026	550	2,100,000	727	2,682,000
2027	550	2,100,000	727	2,682,000

NOTES:
1. All Demand Peaks occur during the “Summer” allocation Season.
2. Current WAPA CROD’s are Winter – 316 kW, Summer – 737 kW.
3. It is expected that Peak Demand and annual energy usage at HRC will declined after the 2019 when the construction project is completed.

7.0 Capacity and Energy Situation

These sections summarize the need for additional capacity on the Hastings electric system, and the sources and uses of energy on the system. The range of capacity need is based on the load growth forecasts discussed in Section 6, and other scenario parameters.

7.1.0 Scenarios of Need for Capacity

7.1.1 Base Case Scenario

The Base Case scenario of capacity need assumes the mid-range peak demand forecast, existing WAPA power purchase agreement, and operation of all existing generating units through 2020. The available capacity of the existing supply system under this scenario in future years is detailed in Table 7-1. Table 7-1 also shows the total capacity requirement compared to available capacity at a growth factor of 1.25% plus the addition of 35 MW's from the 220 MW WEC 2 Unit that was put into service in 2011.

The total capacity requirement for Hastings includes the retail peak demand, reserves and wholesale sales. Reserves are calculated as 12.0 percent of the retail peak demand less firm purchases from WAPA.

Figure 7-1 illustrates the amount of existing capacity available to the system in comparison to capacity needs in future years as well as the actual values for 2017. With the addition of the 35 MW's in 2011, Hastings will have excess capacity beyond 2027.

Table 7-1

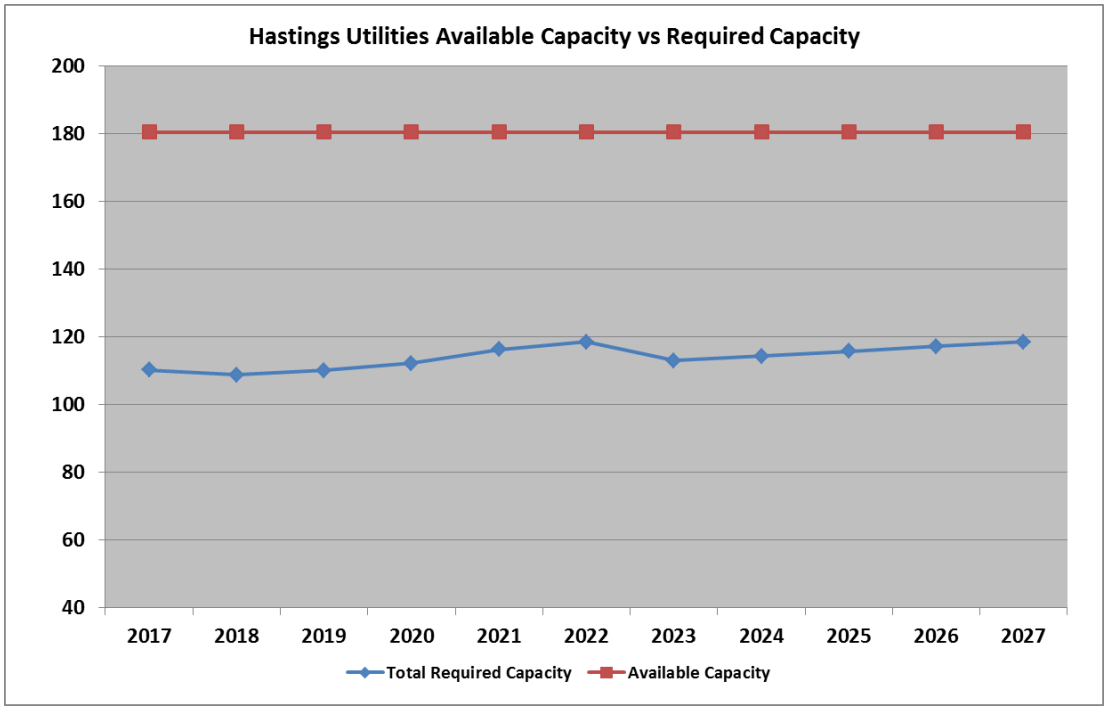
Year	Peak Demand	12.0% Reserve	MEAN	Assign WEC 2	City of Superior Capacity	Total Required	Available Capacity	Excess (Deficit) Capacity
2017	90.3	9.5	5.3	5.0		110.1	180.4	70.3
2018	91.4	9.6	5.3	0.0	2.3	108.6	180.4	71.8
2019	92.6	9.7	5.3	0.0	2.4	110.0	180.4	70.4
2020	93.7	9.9	5.3	0.0	3.2	112.1	180.4	68.3
2021	94.9	10.0	5.3	0.0	6.0	116.2	180.4	64.2
2022	96.1	10.2	5.3	0.0	6.8	118.3	180.4	62.1
2023	97.3	10.3	5.3	0.0		112.9	180.4	67.5
2024	98.5	10.5	5.3	0.0		114.3	180.4	66.1
2025	99.7	10.6	5.3	0.0		115.6	180.4	64.8
2026	101.0	10.7	5.3	0.0		117.0	180.4	63.4
2027	102.2	10.9	5.3	0.0		118.4	180.4	62.0

Notes:

1. Reserves calculated as 12.0% of Peak Demand less WAPA firm Capacity (11.4 MW)
2. Available capacity based on following values:

WAPA	11.4	MW
WEC-1	76.0	MW
NDS	40.0	MW
DHPC	18.0	MW
WEC-2	35.0	MW

Figure 7-1



7.2 Energy Sources and Uses

Sources of energy for the Hastings electric system in years 2015 and 2016 are summarized in Figure 7-2. Hastings produces the bulk of system energy from its own generating facilities, representing roughly 65 percent of the total need each of these years. Approximately 9 percent of energy is currently provided by the WAPA capacity purchase, and 25.0 percent is provided by SPP IM purchases. Hastings has purchased more from the SPP IM in 2015 and 2016 because of the low market prices.

The uses of energy on the Hastings electric system in years 2015 and 2016 are summarized in Figure 7-3. Retail energy sales accounted for 65 percent of total system energy in 2016.

Figure 7-2

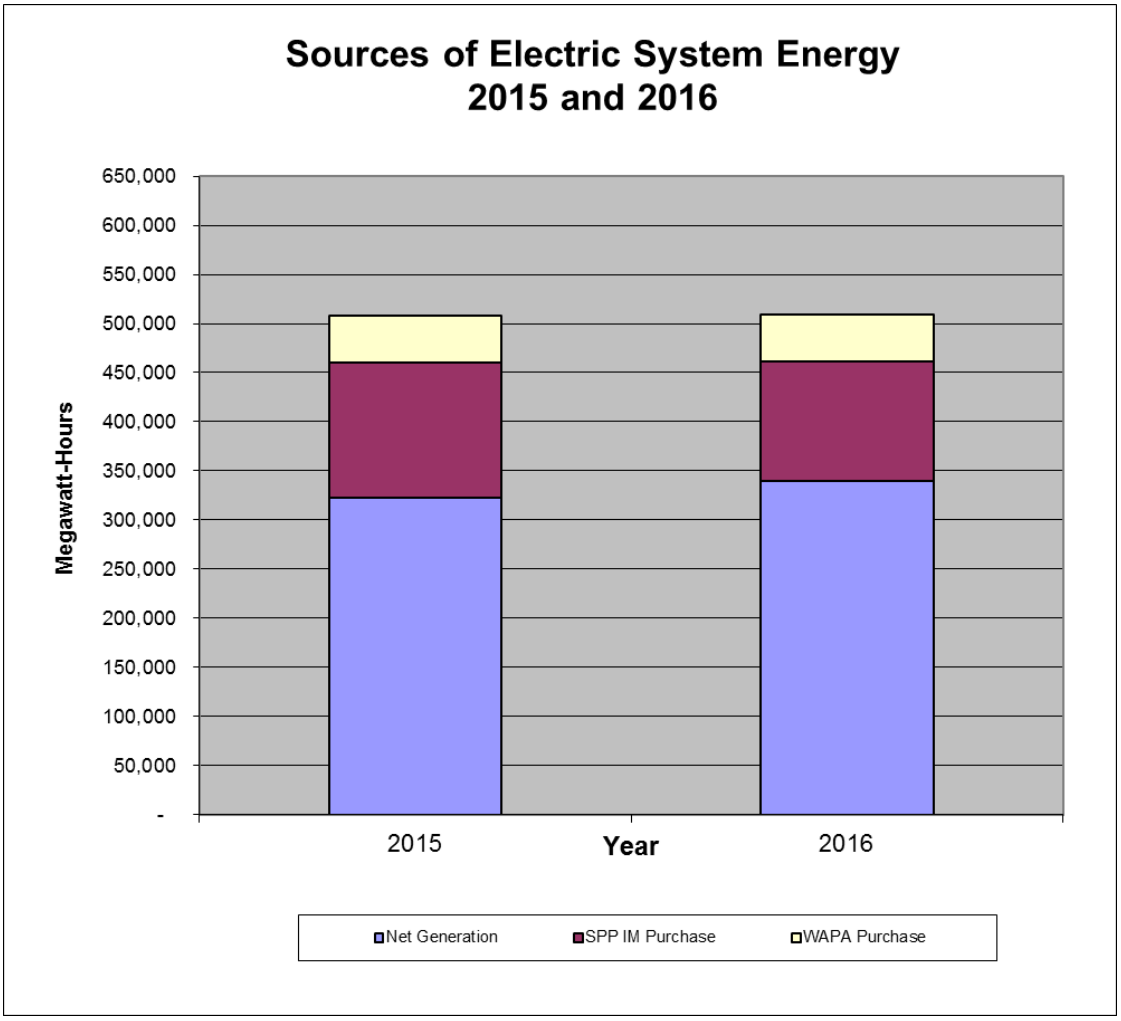
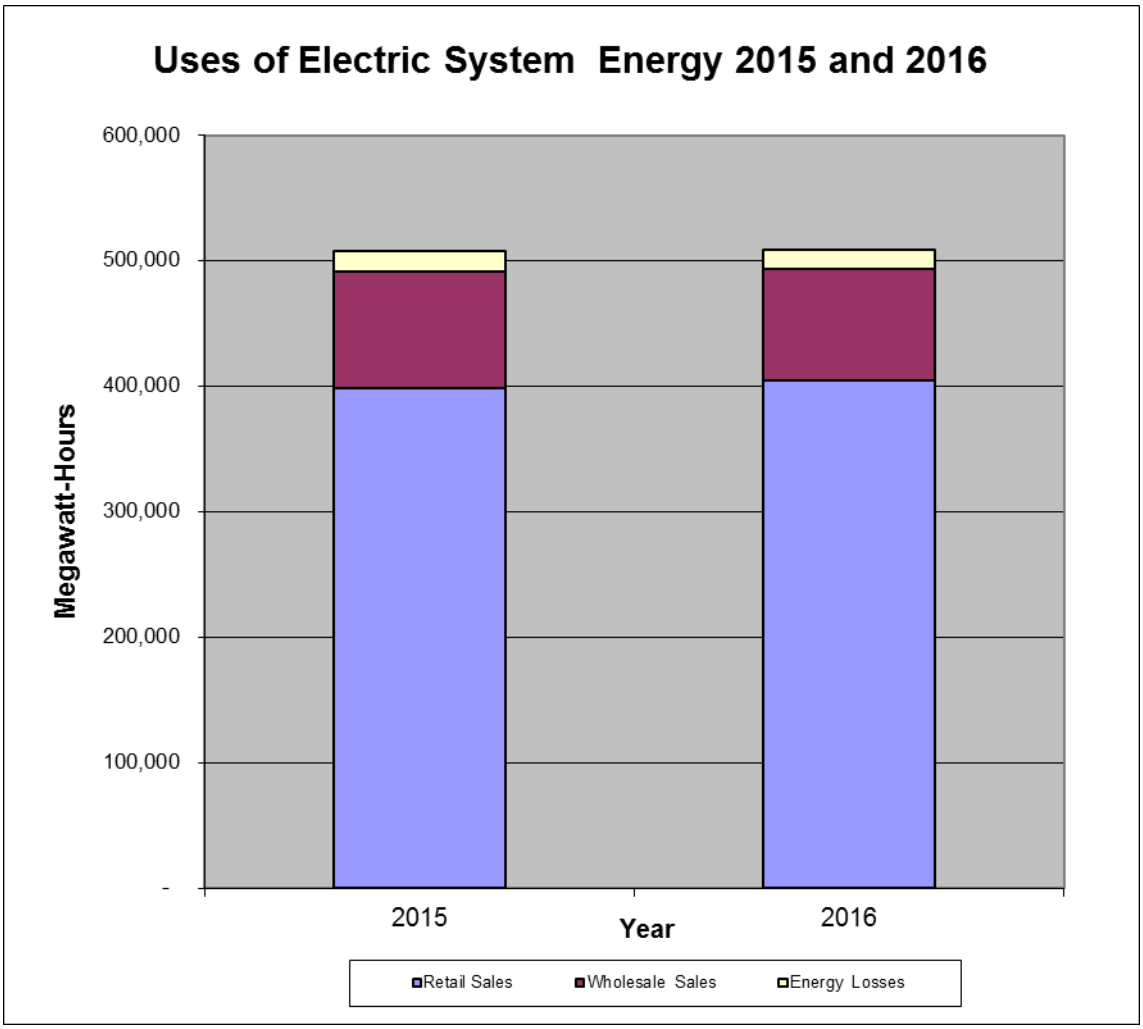


Figure 7-3



8.0 Nebraska Power Association - Statewide Plan

According to the 2012 Nebraska Power Association (NPA) Statewide Coordinated Long Range Power Supply Plan, the current generation capacity is expected to be in an excess capacity until 2024. Statewide annual energy requirements continue to grow at a 1.3 percent growth rate.

9.0 Public Participation Process

9.1 Hastings

Part of the Cooperative Integrated Resource Plan (IRP) implementation process involves public participation. Hastings has a Utility Board (Board) that serves an advisory function to the Hastings City Council (Council) and meets under the Open Meeting Laws of the State of Nebraska. The Open Meeting Laws require all meetings of the Board to be advertised prior to the meeting date and to provide for open attendance of all interested members of the general public. Notice of the pending Board meeting was advertised in the Hastings Tribune, a local newspaper. The agenda was published and distributed to media outlets prior to the meeting and the opportunity for public input was provided for at the December 14, 2017 Board meeting. There were no comments received by the public and the Board took action to unanimously recommend approval of the IRP by the Council at its next regularly scheduled meeting on January 8, 2018.

The Council also meets under the Open Meeting Laws of the State of Nebraska. Notice of the January 8, 2018 Council meeting was advertised in the Hastings Tribune. The agenda, including the proposed IRP action item was published and distributed to media outlets and posted on the City website prior to the meeting, plus an opportunity for public input was provided for at the January 8, 2018 Council meeting. There were no public comments received and through Resolution No. 2018-02, the IRP was formally approved for submittal to WAPA by a unanimous vote of the Council on January 8, 2018 (attachment 11-1).

In addition, Hastings has been active in providing information of interest to customers via a monthly newsletter. Information has included rate comparisons, pending federal legislation that may impact utility operations, operational considerations and concerns including future power supply needs along with many other topics. Hastings has also surveyed its customers twice in the past several years to determine their desires and satisfaction level with Hastings' service and operations.

As a locally owned municipally utility, Hastings makes great efforts to operate in a transparent manner and as such, comes under the scrutiny of the press and general public. Major operational decisions receive full public disclosure prior to being implemented. As Hastings moves closer towards the need to make a decision in regard to

future power supply resources, the general public will be kept apprised and provided the opportunity to submit input along the way.

9.2 HRC

HRC is a State Governmental Agency that does not purchase for resale. As such, the public participation requirement is satisfied by review and concurrence of a top management official with resource acquisition responsibility. Please see attachment 11-2.

10.0 Renewable Energy Options

10.1 Hastings Wind Energy

On August 31, 2016, Hastings entered into a Power Purchase Agreement with Omaha, Nebraska based Bluestem Energy Solutions (Bluestem) to purchase 100% of the output from a 1.7 MW General Electric wind turbine. The single commercial scale wind turbine interconnects directly into the Hastings distribution system with all energy produced being used locally. The project was facilitated by Hastings and Central Community College (CCC) and will be owned and operated by Bluestem. The turbine is located just south of the CCC Hastings' campus on property owned by CCC and began commercial operation on December 29, 2016.

Hastings also entered into a Wind Power Purchase Agreement with CCC, which allows CCC the ability to purchase up to 100% of its annual energy needs at the Hastings' campus from a renewable energy resource. CCC also has an agreement in place with Bluestem that will allow CCC students access to the GE turbine for training and instructional purposes for CCC's wind tech program which it will be expanding in the near future.

Hastings views this partnership as a "win-win" for all involved. Hastings is participating in a local renewable energy project with high visibility, CCC will be in better position to achieve its goal of 100% green energy plus it gains the ability to expand curriculum for students in a "hands on" learning environment, and Bluestem constructed

the facility and has developed a positive business relationship with both Hastings and CCC going forward.

11.0 Implementation Plan

11.1 Hastings

With the addition of the 35 MW's from the joint PPGA owned coal-fired plant that began commercial operation in May, 2011, Hastings will be in the excess generation position well beyond 2031. Hastings has the luxury of monitoring market developments to determine the optimum energy source for anticipated load growth. To accomplish this goal, the following tasks will be completed in the next two to five years:

1. Hastings will continue to market excess capacity as opportunities become available.
2. Hastings will continue to utilize load conservation measures and improve system efficiency as outlined in Section 5 to minimize the impact of anticipated growth levels on existing capacity.
3. Hastings will continue to monitor customer needs for more renewable energy.

11.2 HRC

HRC currently has adequate supplies of energy available to satisfy all anticipated load swings during the next fifteen years. No increase in energy needs are anticipated to be needed in the near term, HRC will continue to enhance its current system efficiency in the following manner:

1. HRC will continue all load conservation and DSM programs as outlined in Section 5.
2. HRC will communicate closely with Hastings as to its load status to ensure the availability of supplemental power supplies from Hastings.

Attachment 11-1

RESOLUTION NO. 2018-02

WHEREAS, the City of Hastings, Nebraska (Hastings) has a long-term firm power resource commitment (Allocation) with the Western Area Power Administration (WAPA) to supply the Allocation to Hastings; and

WHEREAS, as required by the Energy Policy Act of 1992 and WAPA's adoption of the Energy Planning and Management Program, Hastings is required to prepare and submit an Integrated Resource Plan (IRP) to WAPA every five years to maintain the Allocation; and

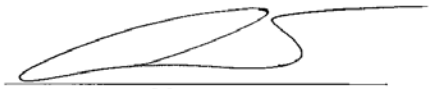
WHEREAS, in 1996 Hastings received authorization from WAPA to submit a Cooperative IRP that included the Hastings Regional Center (HRC) facilities as HRC also holds a WAPA Allocation that Hastings oversees administratively, including the delivery of the Allocation to the HRC facility, and

WHEREAS, the City Council of Hastings has reviewed and approves of the IRP prepared for Hastings and HRC.

NOW, THEREFORE, BE IT RESOLVED in consideration of the foregoing recitals, and the recommendation of the Hastings Utility Board, the Mayor and City Council of the City of Hastings, Nebraska, hereby adopt the following resolution:

> BE IT RESOLVED that the Integrated Resource Plan (IRP) for the City of Hastings and the Hastings Regional Center be and the same is hereby adopted and the City Clerk is directed to submit the same to the attention of the Regional Manager of the Billings, Montana area office of the Western Area Power Administration prior to January 30, 2018.

PASSED AND APPROVED this 8th day of January, 2018.



Mayor

ATTEST:

City Clerk

(S E A L)

Approved as to form:

City Attorney

STATE OF NEBRASKA)
) ss.
COUNTY OF ADAMS)

I, KIMBERLY JACOBITZ, City Clerk of the City of Hastings, do hereby certify that the foregoing Resolution was adopted by the Hastings City Council of the City of Hastings on the 8th day of January, 2018.

Kimberly Jacobitz
Hastings City Clerk
Hastings, Nebraska

SUBSCRIBED AND SWORN to before me this 8th day of January, 2018.

State of Nebraska - General Notary
CARLA SCHEIERMAN
My Commission Expires
July 21, 2021

Notary Public

Attachment 11-2

NEBRASKA
Good Life. Great Service.
DEPT. OF ADMINISTRATIVE SERVICES

Pete Ricketts, Governor

December 22, 2017

James DeTour
1228 N Denver Ave
Hastings, NE 68901

RE: Hastings Regional Center Cooperative Integrated Resource Plan

Dear Mr. DeTour:

Thank you for your collaborative preparation of the Hastings Regional Center Cooperative Integrated Resource Plan for the Western Area Power Administration dated December 2017. The Hastings Regional Center Cooperative Integrated Resource Plan accurately details the future changes proposed for the campus.

The State Building Division will provide energy consumption data as we monitor the impacts of the proposed improvements to the campus.

Sincerely,

Caleb S. Strate

Caleb S. Strate, P.E.
Engineer III | State Building Division
Nebraska Department of Administrative Services

Amber Brannigan, Building Administrator
Department of Administrative Services | STATE BUILDING DIVISION
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