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Southern Power District Energy Park Development Report 2018

Grand Island, Nebraska

Southern Power District



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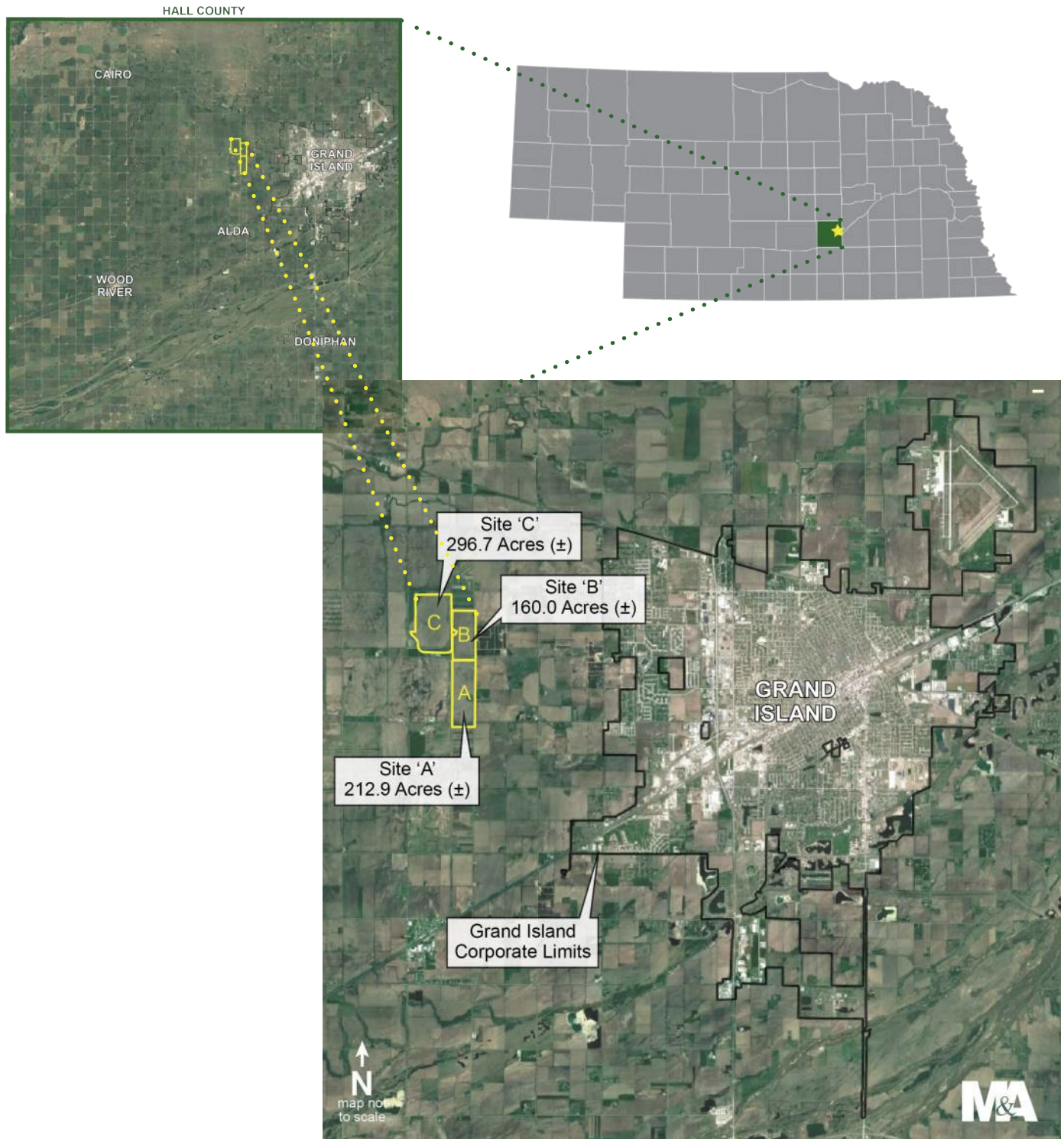
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INTRODUCTION

The following report demonstrates key indicators used to outline the feasibility of new development on land owned by Southern Power District (SPD). Southern Power District contracted Miller & Associates Consulting Engineers, P.C. to complete master planning for a 670-acre site owned by SPD. The site is located two miles west of the City of Grand Island, in Hall County. The project site is broken into three primary parcels and is bordered on the south by Old Potash Highway, east by County Road 22, north by Capital Avenue and west by County Road 24. All three tracts of land were purchased by SPD, from the United States Secretary of Army, in the summer of 2003. This 670-acre site, along with other adjacent land, was primarily used as the Cornhusker Army Ammunition Plant and therefore has a long and unique history.



Project Location Map



Southern Power District Board members understand the value and importance of long-term master planning for this 670-acre site. The project site is a viable location for commercial and industrial growth; therefore, SPD wants to maximize the use of the land while promoting commercial and industrial development in conjunction with electrical power demand growth. Detailed information about the Energy Park can be found on LOIS (Location One Information System), using this [link](#).

To help further understand the site's potential and assist SPD Board members with marketing the commercial/industrial lots, demographic and economic data analysis, soils analysis, and infrastructure feasibility determination was needed for the project site. The following report evaluates the development potential and for this specific project area. There are several benefits to developing this area of land. Access to existing electrical and water infrastructure and economic development incentives, like Tax Increment Financing (TIF) are a few of the existing benefits. Details regarding public infrastructure and development incentives are outlined in this report.

SPD's vision, mission, and values statements can be found below. These statements speak to the culture SPD as built and continues to foster.

VISION STATEMENT

Powering a new and brighter future for our customers and communities while supporting public power in the State of Nebraska.

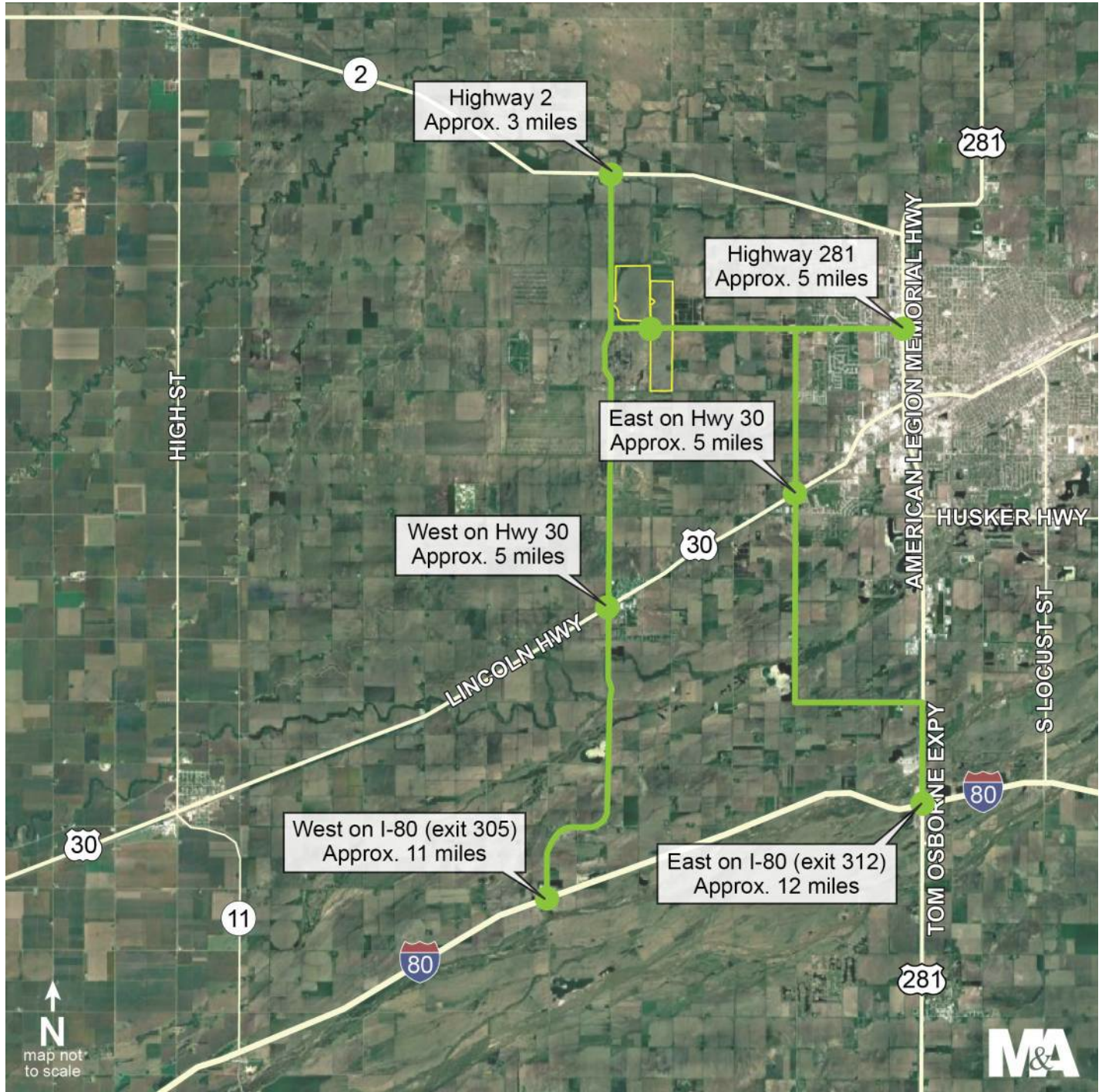
MISSION STATEMENT

To safely provide our customers with highly reliable and competitively priced electricity, superior customer service, and innovative energy solutions.

VALUES STATEMENT

We will value our employee and customer opinions. We will work together to support, trust, and respect each other. We will conduct business in a safe and honest manner. We will do what is right, treat others the way we want to be treated, and lead by example. We will strive for excellence.

The project site has quick and easy access to the larger transportation network, including Highway 2, Highway 30, and Interstate-80. The Access to Major Roads Map, below, shows the approximate distances from the SPD Energy Park to the various arterial roads that will provide access to the region.



Access to Major Roads Map

DEVELOPMENT INCENTIVES

There are several development incentives available to eligible businesses. Below is an outline of different local and State incentives available within the SPD Energy Park. More detailed information and eligibility requirements can be found using the links provided for each funding option.

Local Incentives

NPPD's Economic Development Incentive Rate

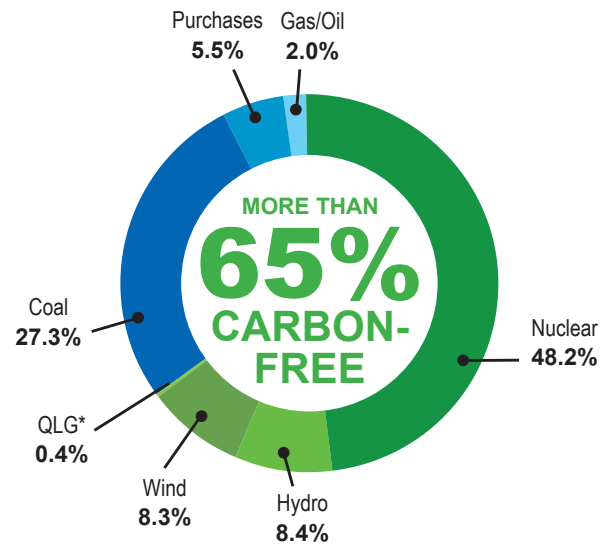
NPPD's economic development electric rate gives eligible customers discounted energy prices for up to five years. The Economic Development Rate could fall in the range of 3.7 to 5.0 cents per kilowatt hour. Businesses must have: new or additional load of 1 megawatt or greater with a monthly load factor of 60% or greater; entered into a written agreement with the State of any political subdivision to provide an economic development project pursuant to State or local law; wholesale customer and end-user customer have entered into a written service agreement with NPPD. Contact Brian Vasa, NPPD Economic Development Consultant at 308-289-0382 or by email at bkvasa@nppd.com for assistance in understanding the benefits of these programs and to help guide you through the process. The full Economic Development Electric Incentive Rate brochure can be found in the appendix.

Tax Increment Financing (TIF)

The SPD Energy Park is within Blight & Substandard Area 25, as declared by the City of Grand Island. With this declaration, TIF is available for eligible development including, but not limited to, public infrastructure, landscaping, lighting, and site preparation. More specifics regarding Blight & Substandard Area 25 can be found on the City of Grand Island's website (<http://www.grand-island.com/home/showdocument?id=18446>).

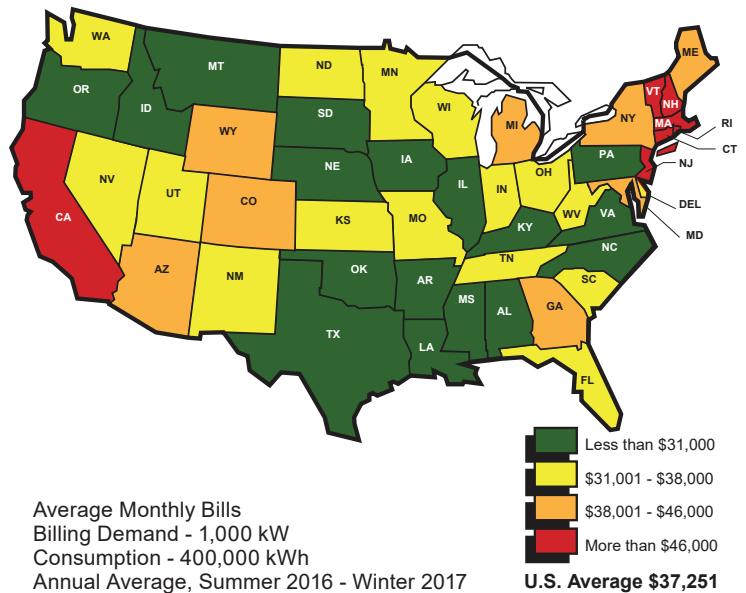
LB840

Local Option (LB840) is the primary incentive offered by the Grand Island Area Economic Development Corporation (GIAEDC). LB840 is a cash payment made directly to your company based on job creation and training needs for your employees. A structured payment system is established between expanding businesses and the GIAEDC. Training incentives can be paid up front to jumpstart your business, while job creation incentives are an annual payment delivered over a three-year period of time. We are also capable of structuring a low interest and/or forgivable loan to meet your business's needs.



NPPD Energy Generation Resources - 2017
(Nebraska Customers)

Source: NPPD



Electric Costs for Industrial Service Summer 2016 - Winter 2017

Source: NPPD, Edison Electric Institute, "Typical Bills and Average Rates Report," July 1, 2016 and January 1, 2017. State averages are weighted using eight months of July 2016 data and four months of January 2017 data. Nebraska data represents the average for Omaha Public Power District, Lincoln Electric System, and Nebraska Public Power District using the same weighting.

State Incentives

Nebraska Advantage

The Nebraska Advantage package was designed to create a business climate that makes Nebraska the preferred location for starting and growing your business. The Nebraska Advantage rewards businesses that invest in the state and hire Nebraskans. In this progressive, pro-business tax climate, corporate income and sales taxes are reduced or virtually eliminated.

(<http://neded.org/why-nebraska/incentives/>)

The Nebraska Advantage package benefits businesses with:

- Investment credits
- Wage credits
- Sales tax refund
- Customized job training
- State and local sales tax exemptions for purchases of manufacturing machinery, equipment, and related services
- Research and development tax credits
- Microenterprise tax credits
- Inventory tax exemptions

Site & Building Development Fund

The Site and Building Development Fund (SBDF) provides financial assistance to eligible local governments and Nebraska non-profit organization to prepare parcels of land and building for future industrial growth and development. The following are eligible activities:

- Land and building acquisition.
- Building construction or rehabilitation.
- Site preparation.
- Infrastructure development and improvements.
- Engineering and design costs.
- Technical assistance and planning.
- Pre-approved costs necessary for the development of industrial-ready sites and buildings.

More information about the SBDF is available on Nebraska Department of Economic Development's website. (<https://opportunity.nebraska.gov/program/site-and-building-development-fund-sbdf/>)

Microenterprise Tax Credit

Provides a 20% refundable tax credit to microbusinesses on increased compensation for employees or increased investment in targeted communities. Applicants may qualify for a maximum of \$10,000 throughout the life of the program. The credit is limited to companies with five or fewer employees at the time the application is filed, including start-ups. Credits are approved on a first-in-first-out basis through an application process with the Nebraska Department of Revenue. The credits are earned on increased expenditures for wages, buildings, certain expenses, and non-vehicle depreciable personal property.

Nebraska Enterprise Fund

Nebraska Enterprise Fund supports micro and small businesses by providing capital, training, and technical assistance. Their business resources include loans, training, and mentoring for start-up businesses. More information about their business resources can be found on their website. (<http://nebbiz.org/business-resources>)

REAP (Rural Enterprise Assistance Project)

This program was created by the Center for Rural Affairs as a rural micro-enterprise lending organization. REAP provides counseling, technical assistance, and training for small business owners as well as offers low interest loans to small businesses with five employees or less. REAP and the Center for Rural Affairs offers business start-up assistance as well as a variety of small business loan programs. More information about REAP can be found on their website. (<https://www.cfra.org/reap>)

Innovation Programs

The Nebraska Innovation Fund is designed to enhance momentum in Nebraska's fastest growing industries, maintain and building on its world-class workforce, and leverage private sector innovation. The following grant and investment programs are available under the Nebraska Innovation Fund:

- *Prototype Grant Program*

The Prototype Grant is a matching grant that provides financial assistance for product development to businesses operating in Nebraska.

(<https://opportunity.nebraska.gov/program/prototype-grant/>)

- *Intern Nebraska*

The Intern Nebraska Grant Program (InternNE) provides financial assistance to businesses who create new internships.

(<https://opportunity.nebraska.gov/program/intern-nebraska/>)

- *Academic R&D Grant Program*

This program offers businesses a matching competitive grant for research and development activities done in conjunction with a Nebraska college or university. It should be directed toward the following: commercialization of new projects; modification of existing products that lead to substantially improved marketability; or improvement of existing processes that may provide a new source of revenue to Nebraska businesses.

(<https://opportunity.nebraska.gov/program/nebraska-academic-research-and-development-grant/>)

- *SBIR/STTR Grant Program*

The Nebraska Small Business Innovation Research/Small Business Technology Transfer Initiative (SBIR/STTR) is a matching grant that provides financial assistance to Nebraska businesses that have received a Federal SBIR or STTR grant. This program provides funding during two phases of the Federal SBIR/STTR process. In Phase 0, funds are available to assist Nebraska small businesses during the federal application process. In phases 1 and 2, matching grants from the Nebraska Initiative are available for successful federal applications to support research and commercialization.

(<https://opportunity.nebraska.gov/program/nebraska-small-business-innovation-research-small-business-tech-transfer-sbirsttr-grant-program/>)

- *Angel Investment Tax Credit*

The Nebraska Angel Investment Tax Credit (AIRC) program provides refundable state income tax credits to suitable investors who invest in early-stage companies. The AIRC program is focused on high-tech business in the State of Nebraska. Qualified small businesses must be Nebraska-based with more than 51% of their employees in Nebraska and have fewer than 25 employees at the time of the investment.

(<http://www.neded.org/program/angel-investment-tax-credit/>)

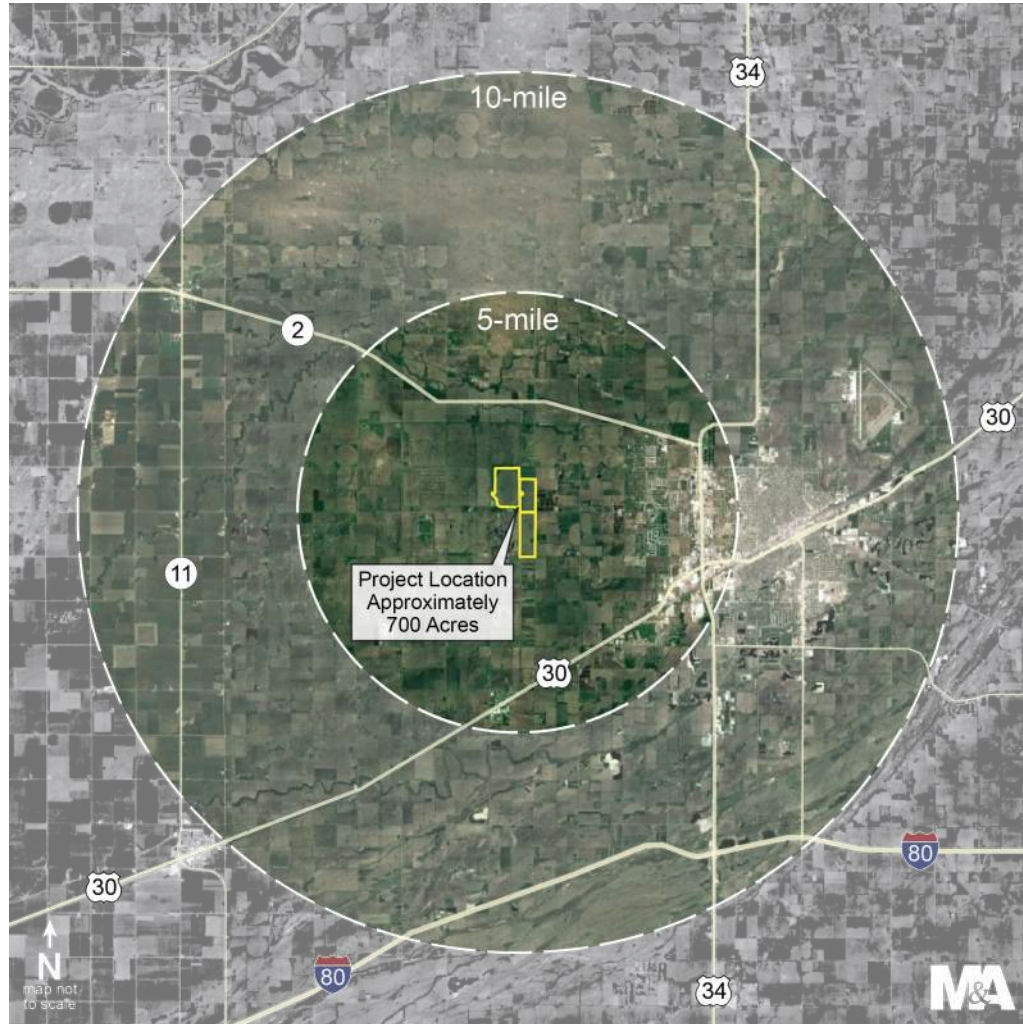
- *SEED Investment Program*

The program, through a private partner, can invest up to \$500,000 in a Nebraska business for commercialization of a product or process. Think of it this way—our investment acts much like an angel investment for companies at the seed stage of the financing continuum.

(<https://opportunity.nebraska.gov/program/nebraska-seed-investment-program/>)

DATA SOURCES

Demographic and economic data analysis helps highlight the feasibility and opportunity for industrial growth in the Grand Island area. In order to determine applicable data, a 5-mile radius and 10-mile radius was drawn around the project site. Data comparisons include the two radii and the corporate limits of Grand Island. Several Federal data sources were used to gather relevant demographic and economic information. The data sources utilized in this report are outlined below in alphabetical order by their abbreviation:



5- and 10-mile Radius Map

ACS

U.S. Census Bureau. 2012-2016 American Community Survey (ACS) 5-Year Estimates. ACS 5-year estimates become available in December of the year following the calendar year of the data. ACS (2012-2016) 5-year estimates were released December 7, 2017. <https://www.census.gov/programs-surveys/acs/>

BLS

U.S. Department of Commerce - Bureau of Labor Statistics. Local Area Unemployment Statistics. 2007-2016. Published November 2017. <https://www.bls.gov/lau>

The BLS Local Area Unemployment Statistics (LAU) program publishes monthly updates on labor force activity in the United States. The program is a cooperative effort between the Department of Commerce and state governments. The LAU program produces estimates on employment and unemployment using models that draw from the Current Population Survey (CPS), the Current Employment Statistics (CES) survey, state unemployment insurance (UI) systems and other US Census products. Employment is defined as having worked at least one hour as a paid employee during the survey week of reference (includes persons on vacation or extended leaves of absence).

DC Timeseries

Time series are a collation of Census products spanning almost thirty years and include projections for future years. Time series consist of 1990, 2000, 2010 Decennial Census counts, 2007-2011 ACS 5-year estimates, and 2012-2016 ACS 5-year estimates. Census 1990 and 2000 data have been harmonized to 2010 Census geographies to be rendered comparable with data from later years. For more information on sources and methodology, see the help documents on historical Census data (<http://help.mysidewalk.com/maps-and-charts/historical-census-data-in-mysidewalk>) and mySidewalk Census projections (<http://help.mysidewalk.com/maps-and-charts/census-data-projections-in-mysidewalk>). This dataset contains the estimated number of employed persons 16 and over in a given geography.

LEHD

U.S. Environmental Protection Agency (EPA). Smart Location Database (SLD), Version 2.0. Published July 2013. (<https://www.epa.gov/smartgrowth/smart-location-mapping>)

The EPA's Smart Location Database (SLD) contains variables summarizing demographic, employment, and environmental conditions for every Census block group in the United States. The EPA developed the database to provide researchers with tools for comparing location efficiency across the country. The database includes concepts such as residential and employment density, land use diversity, design of the built environment, access to destinations, and distance to transit. The EPA generated the variables from the following data sources: 2010 Census, ACS 2006-2010 Five Year Estimates, 2010 Longitudinal Employer-Household Dynamics, InfoUSA 2011, NAVTEQ 2011, PAD-US version 1.3, 2011 TOD Database, and 2012 and 2013 GTFS data.

This dataset contains the number of workers by wage stratification in a given geography (by workplace location). High wage workers earn \$3333/month or more. Medium wage workers earn more than \$1250/month but less than \$3333/month. Low wage workers are defined as workers earning \$1250/month or less.

LEHD, LODES, QCEW

US Census. Center for Economic Studies. LEHD Origin-Destination Employment Statistics (LODES) Workplace Area Characteristic Files. Version 7.3. 2002-2015. Published September 25, 2017. (<https://lehd.ces.census.gov/data/loDES/LODES7/>)

The Longitudinal Employer-Household Dynamics (LEHD) program produces new, cost effective, public-use information combining federal, state and Census Bureau data on employers and employees under the Local Employment Dynamics (LED) Partnership. Under the LED Partnership, states agree to share Unemployment Insurance earnings data and the Quarterly Census of Employment and Wages (QCEW) data with the Census Bureau. The LEHD program combines these administrative data, additional administrative data and data from censuses and surveys to produce a number of different data products for analyzing employment, earnings, and job flows in the United States.

The LEHD Origin-Destination Employment Statistics (LODES) provide data on the distribution of job / worker-residence locations by industry across the United States. The LODES Workplace Area Characteristic files provide census block-level job counts by workplace location for the entire country from 2002 - 2015. This dataset contains the percent change in total number of jobs in a given geography between 2005 and 2015.

DEMOGRAPHIC AND ECONOMIC DATA ANALYSIS

The following information details demographic and economic data within the City of Grand Island and a 5-mile and 10-mile radius around the project site. Based on the demographic and economic data analysis, Grand Island and the surrounding region has experienced growth with job opportunities and is projected to see continued growth in the working age population (those over 16 years old). Approximately one-third of the employed population within the SPD 10-mile radius is employed within blue-collar occupations. The project area is attractive for industrial growth which may include blue-collar job opportunities. Additional business and employment growth would benefit Grand Island and the surrounding region; however, participation in the labor force will also need to increase in order to fill additional jobs.

Employment

From 2013 to 2016, Grand Island's employed persons has slightly decreased from 25,952 to 25,107. This relates to the annual average number of employed persons within Grand Island, Nebraska. The employment rate shows what percent of the working age population (18-64) is employed. The national average employment rate is 71.16% according to the 2012-2016 ACS 5-year estimates. Grand Island's employment rate is much higher than the national average at 80.53%.

Employment Rate

Grand Island, NE

80.53%

Nebraska

80.01%

↓ 0.65%

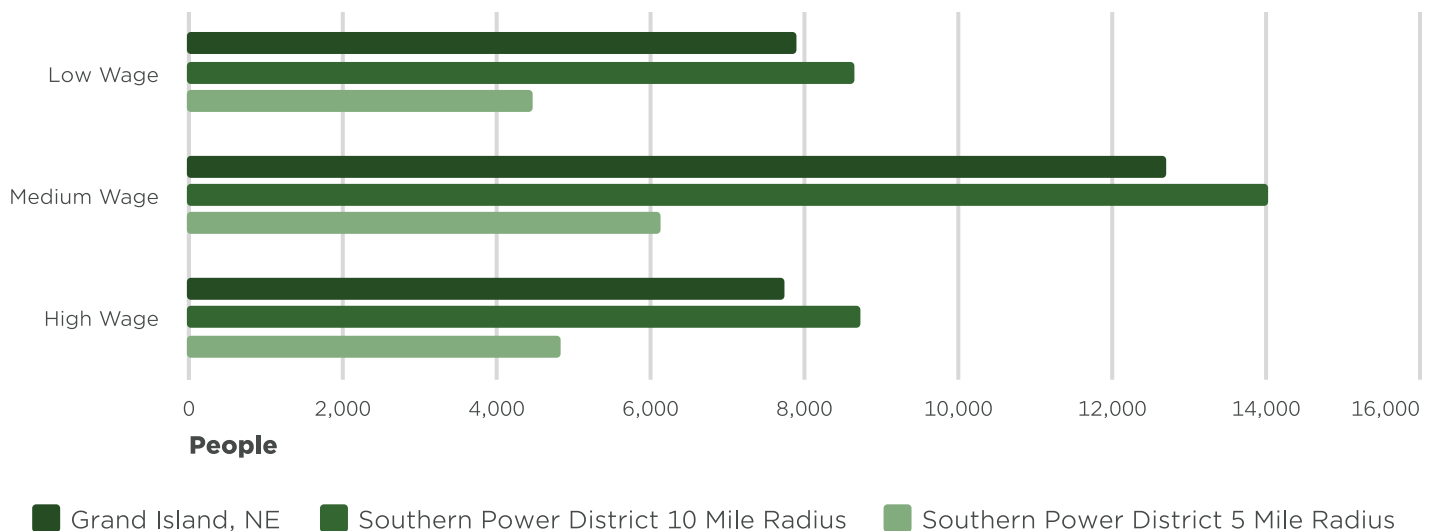
**% Difference shows the percentage increase or decrease as compared to the original geography.*

Sources: US Census 2012-2016 ACS

Wages & Payroll

The chart below demonstrates the amount of money workers take home from local jobs. High wage workers earn \$3,333/month or more. Medium wage workers earn more than \$1,250/month but less than \$3,333/month. Low wage workers are defined as workers earning \$1,250/month or less. The chart compares the 5-mile radius, 10-mile radius, and corporate limits of Grand Island for high, medium, and low wage earners. Medium wage workers make up the largest percentages for SPD 10-mile radius and Grand Island. High wage and low wage workers are similar for all three geographies.

Wage of Workers

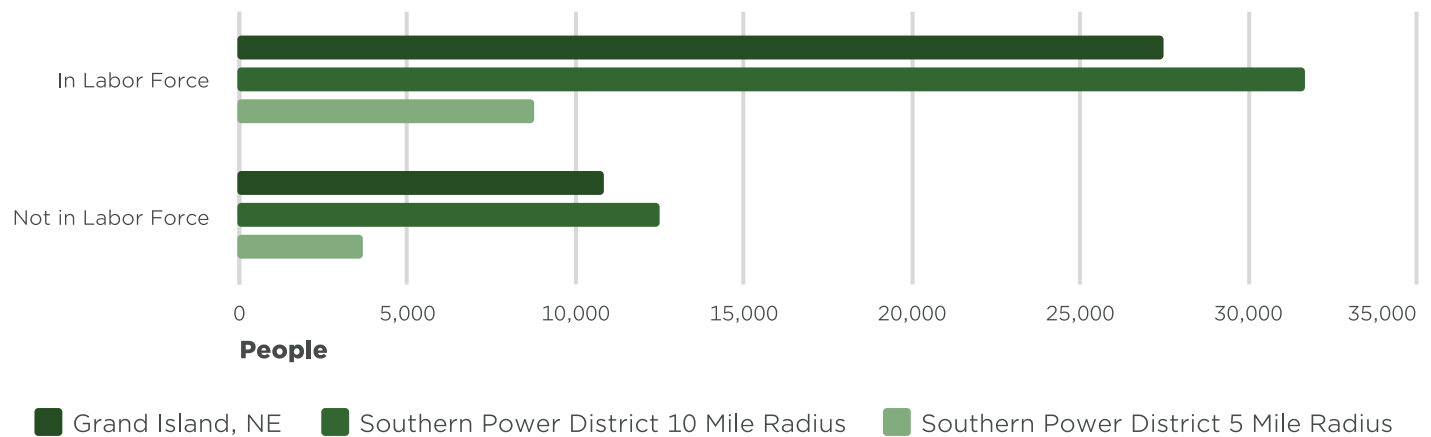


Sources: US Census 2010, LEHD, etc.

Participation in Labor Force

Labor force participation displays the number of residents over 16 who are either employed or unemployed and have been actively looking for a job in the past 4 weeks at the time of the survey. Residents classified as 'Not in Labor Force' are those residents over the age of 16 that are neither employed or officially classified as unemployed and may include retirees, people who have never entered the workforce, full-time students, stay-at-home parents, persons unable to work due to disability, etc. This metric measures if there are adequate employment opportunities for residents within the specific geographic regions. Over 31,000 people are in the labor force within the SPD 10-mile radius, more than 27,500 people are in the labor force within the City of Grand Island.

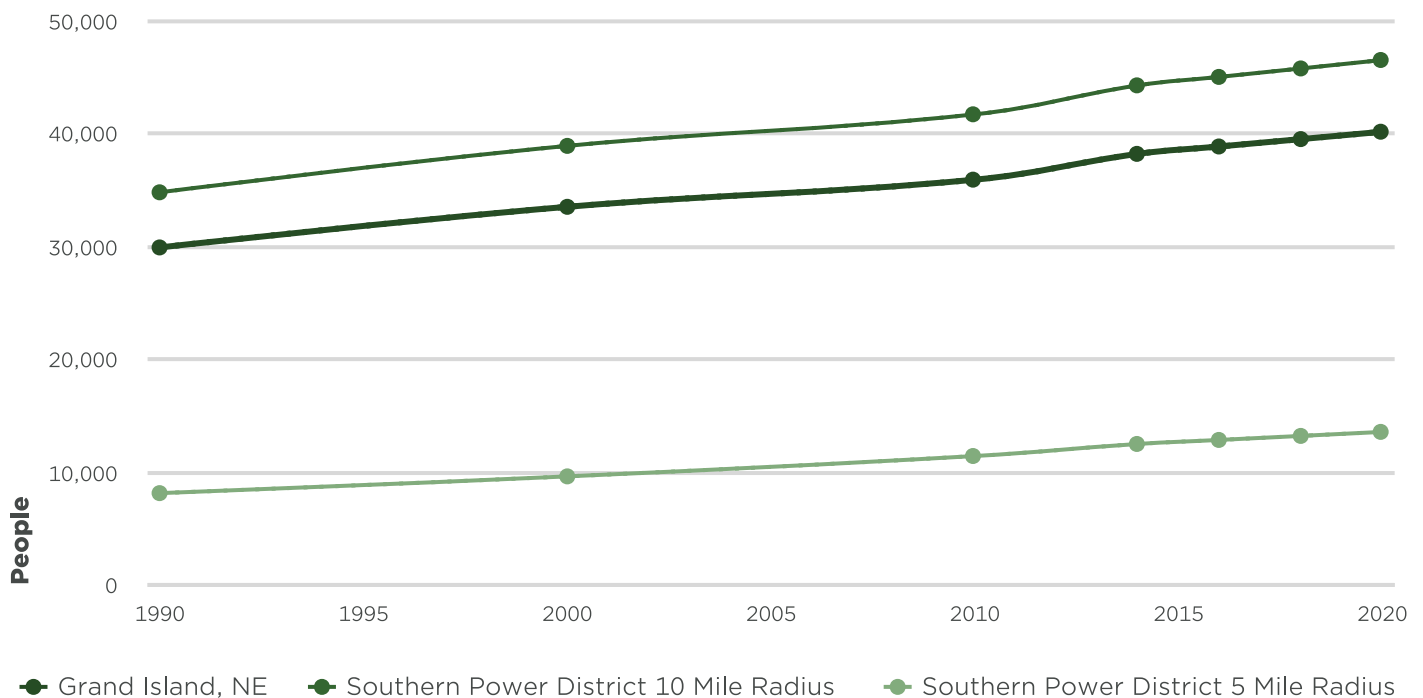
Participation in Labor Force



Sources: US Census 2012-2016 ACS

Using linear projections, the working population 16 and over will continue to grow through 2020. The line graph below shows historic data for the three geographies from 1990 to 2015, with projections shown from 2015 to 2020. In 2015, Grand Island had an estimated 38,245 people of working age by 2020 the City is projected to have 40,210 working age residents.

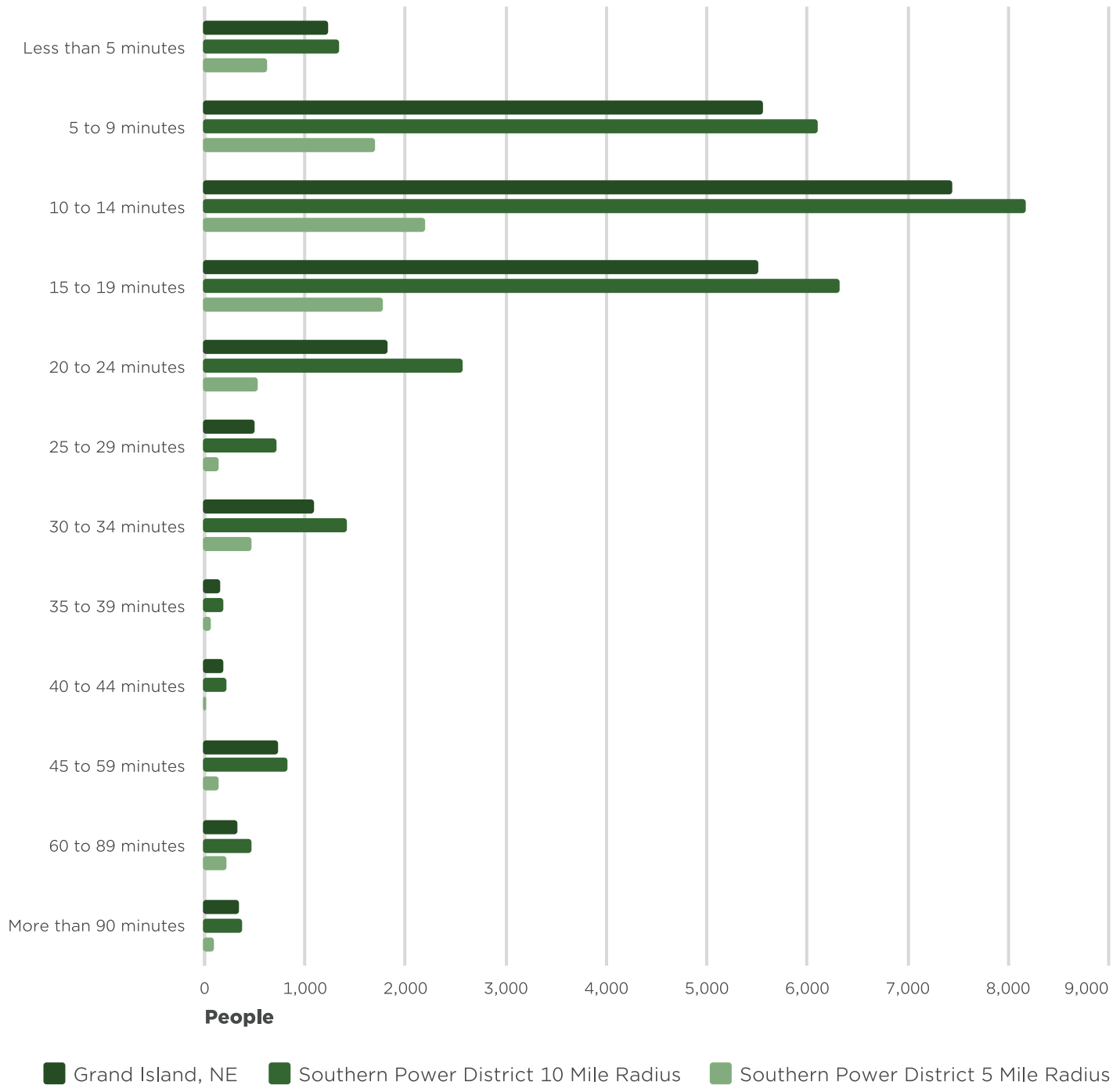
Time Series: Working Population 16 and Over



Sources: DC 1990, 2000, 2010, ACS 2015

Another key factor analyzed for employees is the average commute time to work. The bar chart below outlines commute time to work for employees within the three geographic areas of analysis. The majority of employees commute 10-14 minutes to and from work each day, with some employees commuting longer than 90 minutes. Commute time can affect the quality of life for employees, impacting time spent at home with family and friends as well as influencing available time to work on home improvements, shop, cook, work on hobbies, etc.

Commute Time to Work



Sources: US Census 2012-2016 ACS

Types of Occupations

Employment is classified into 25 occupational categories, as defined by the U.S. Census Bureau (categories are listed in the table to the right). Identified different occupations within the region helps highlight the types of skills employees have for said region. Of the 25 categories, production is the largest employment sector for SPD 10-mile radius and the City of Grand Island. Office and Administrative Support and Sales are the next two largest occupational categories for those two geographic regions. For SPD 5-mile radius, Office and Administrative Support is the largest civilian employment occupation. This data is found in ACS 2012-2016 estimates.

Blue-collar employment, defined as working age residents in “blue collar” occupations, including: natural resources, construction, maintenance, production, transportation, and material moving jobs. ACS 2012-2016 estimates show Grand Island has 9,126, SPD 10-mile radius has 10,393, and SPD 5-mile radius has 2,019 employees within blue-collar occupations.

Change in the Number of Jobs

This data shows the percent change in the number of jobs from 2005 to 2015. The percent change in the number of jobs captures long-term employment dynamics. Grand Island has experienced a 13.49% growth in job opportunities from 2005 to 2015. The State of Nebraska also experienced job increases; however, at a smaller rate of 10.79% for the same time period.

Management
Business and Finance
Computer and Mathematical
Architecture and Engineering
Life, Physical, and Social Science
Community and Social Service
Legal
Education, Training and Library
Arts, Design, Entertainment, Sports and Media
Health Diagnosis and Treating Practitioners
Health Technologist and Technicians
Healthcare Support
Fire Fighting and Prevention
Law Enforcement
Food Preparation and Serving
Building, Grounds Cleaning, and Maintenance
Personal Care and Service
Sales
Office and Administrative Support
Farming, Fishing and Forestry
Construction and Extraction
Installation, Maintenance, and Repair
Production
Transportation
Material Moving

Percent Change - Number of Jobs 2005 to 2015

Grand Island, NE

13.49%

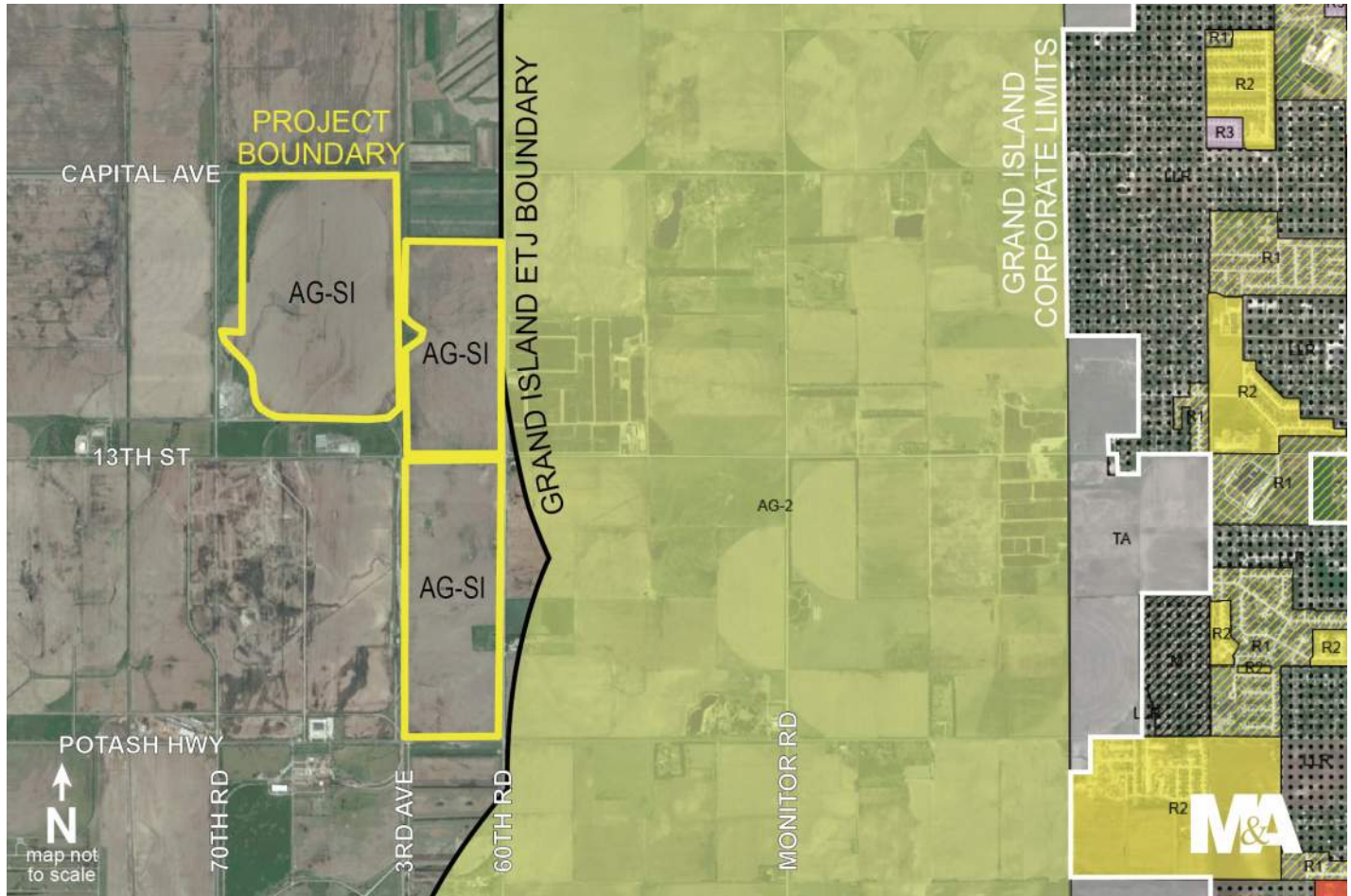
Sources: US Census LEHD, LODES, QCEW

SITE DEVELOPMENT PARAMETERS

Evaluation of site development parameters, including: zoning, public infrastructure, soils, and site layout possibilities were all included in the master planning process for the project area. In the paragraphs and pages below, summary analysis is provided for the site development parameters.

Zoning

The existing zoning for the project area is “AG-SI” Special Agriculture/Industrial Zone. The project area is adjacent to the two-mile ETJ (Extra-Territorial Jurisdiction) for the City of Grand Island. Hall County has zoning jurisdiction for the project area. The intent of the special use district is to maintain lands in a predominately agricultural use, yet allow for limited, low impact recreational uses. For some types of commercial and industrial development, zoning district changes may be required.



Zoning Map

Soils Analysis

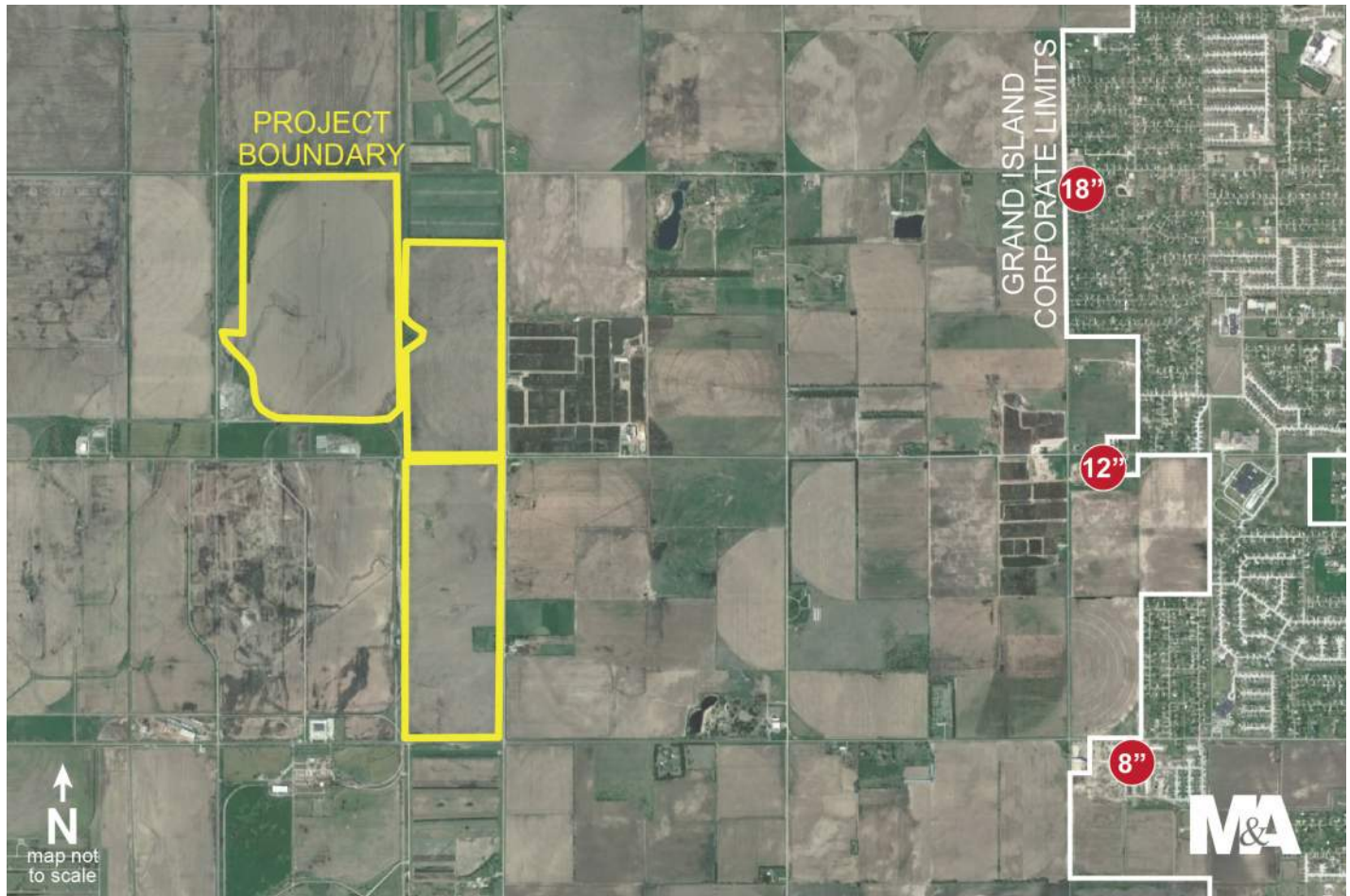
Soils data utilized for the soils analysis is comprised from the United State Department of Agriculture’s Natural Resources Conservation Service (USDA-NRCS). Soils data is reported by County; therefore, the custom report for the Area of Interest (AOI) - Southern Power District is based on Hall County data. The full Custom Soil Resource Report can be found in the Appendix. Present soils within the project area include Jansen fine sandy loam (63.5% of AOI); Hall silt loam, sandy substratum (28.9% of AOI); Hord silt loam (2.8% of AOI); Wood River silt loam (3.4% of AOI); and Wood River-Silver Creek silt loams (1.3% of AOI).

Public Infrastructure

Below is a summary assessment of existing public infrastructure and possibilities for serving the project area.

Sanitary Sewer

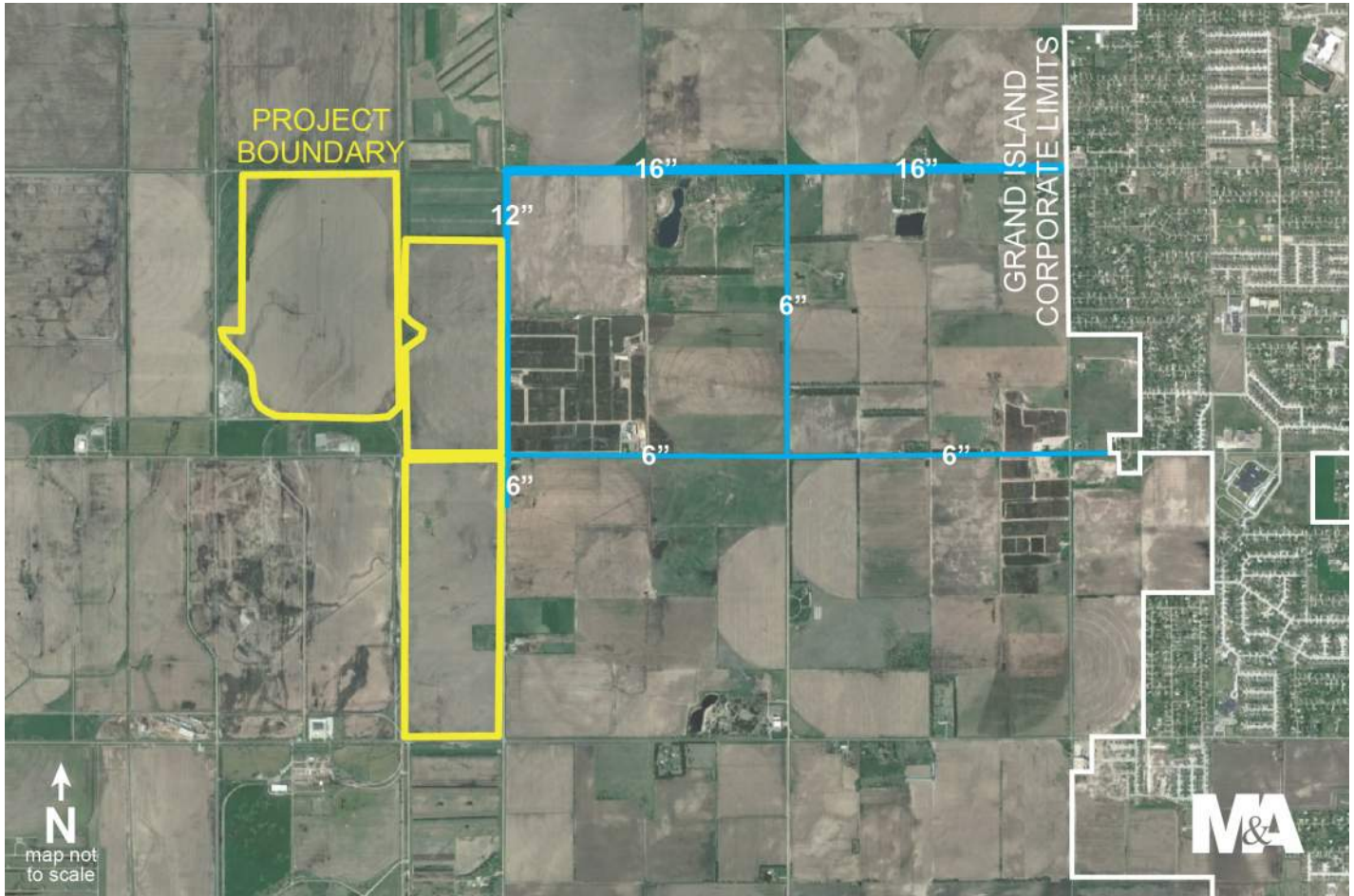
Existing sanitary sewer is located at the boundary of the corporate limits of the City of Grand Island, approximately two miles east of the project area. Existing sanitary sewer includes an 18-inch line located along Capital Avenue; a 12-inch line along 13th Street; and an 8-inch line located along Potash Highway. Future City of Grand Island sanitary sewer may be extended westerly to this project area. However, this site would allow a variety of sewerage options such as septic tanks and leach fields, lagoons, and lift stations / force mains systems. These diverse options will depend on the size and waste stream needs of the development.



Sanitary Sewer Map

Water

Existing water is located adjacent to the north portion of the project area, along 60th Road. A 16-inch water main runs west along Capital Avenue from the City of Grand Island and is looped to a 6-inch main along 13th Street via a 12-inch main on 60th Road and 6-inch main on Monitor Road. The potable water will want to utilize the existing onsite City of Grand water system. In addition to potable water needs, this site although nearly two miles outside the corporate limits also provides fire protection through the means of redundant water main and fire hydrants. Wells may be a consideration for irrigation purposes of landscape and typical green spaces within developed lots.



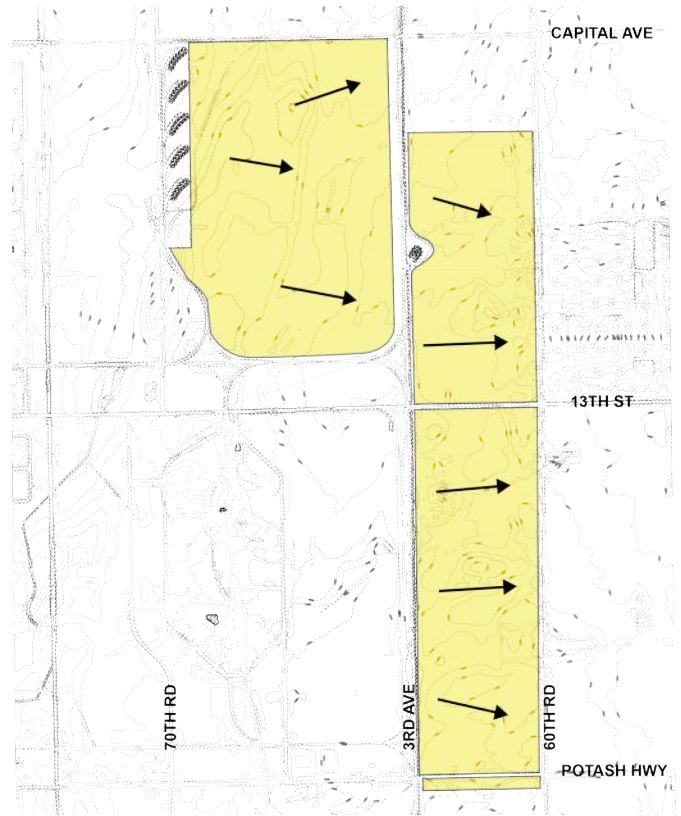
Water Map

Drainage

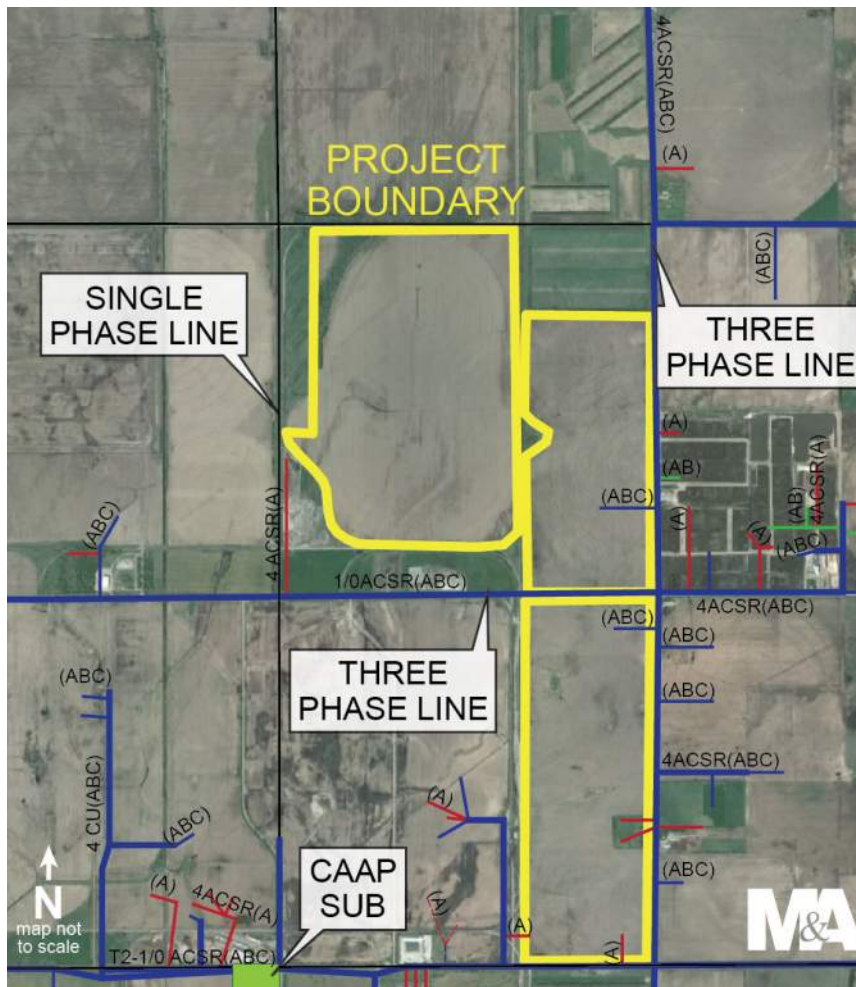
Drainage patterns on the project site are from the west to the east following the contours of the land. The map to the right shows the contours and depicts the flow of drainage for each of the three parcels. As this project area develops storm water detention will be required to detain the increased runoff difference between pre-development and post-development for the impervious areas such as buildings, parking lots, pavement and sidewalks. Depending on the individual needs and sizes of lots, either individual or regional detention cell may be utilized. The size is fairly flat and will likely utilize proposed roads and drainage ditches to convey the storm water runoff through and off the site.

Electrical

Southern Power District has a unique role in this site. They are both the owner and electrical service provider for this development site. The electrical services available to the site are primarily located on the exterior boundaries of the property. As this property develops, the electrical service will be extended throughout Sites A, B, and C.



Contour Map



Electrical Map

SITE LAYOUT OPTIONS

When analyzing the SPD Energy Park, access to public utilities and arterial roads was an important factor in determining how the project area could be developed. Because the area includes 670-acres, SPD Board members knew development would happen in phases.

Site 'A'

The first phase of development will be on the southern-most parcel, Site 'A', due to availability of public infrastructure and access to the public right-of-way as well as existing interest, from a business wanting to relocate in the southeastern corner of the site. The interested business is looking for a 10-acre lot along Potash Highway and could serve as the "anchor tenant" for the SPD Energy Park. The "Proposed Development Plan Site 'A'" on page 18 depicts a possible lot layout for the southern most 213 acres. Within this 213-acres, development will also take place in phases to allow for growth as it is needed. This site development option is hinged on the first possible tenant's desires of a 10-acre lot located in the southeast corner. Lot sizes throughout the 213-acres varies from 3.75-acres to 12.71-acres. This option also allows for lots to be combined or split, to fit the needs of the interested parties.

Site 'B'

Site B is approximately 160 acres having primary access to 60th Road. The existing land use surrounding this parcel consists of agricultural crop and livestock confinement. It could be envisioned that this parcel would be mixed-use and have development consistent with these adjacent land uses. The "Existing Site Plan Site 'B'" on page 19 shows the existing contours and property boundary over an aerial image.

Site 'C'

This 297-acre site has primary access off of Capital Avenue. The west, south, and east sides of this parcel are encompassed by existing railroad spurs which only allows for access to the north. It currently contains irrigated crop, with two-pivot irrigation. With limited access, continued agricultural crop production or related agricultural services would be located on this parcel. Similar to Site 'B' and Site 'A', this parcel could be subdivided into smaller lots to accommodate desired development. The "Existing Site Plan Site 'C'" on page 20 shows the existing contours and property boundary over an aerial image.



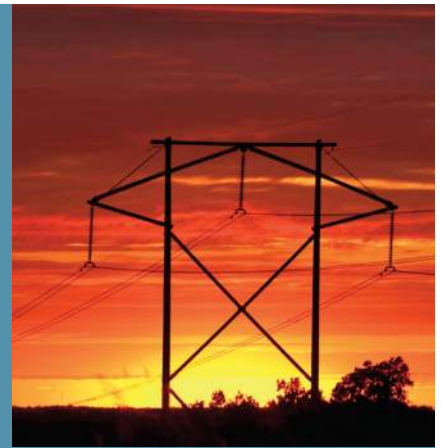




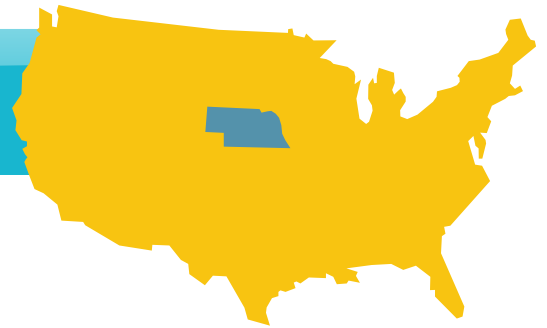
Appendix A

Nebraska Public Power District's

Economic Development Incentive Rate



Powerful Incentive



NPPD's economic development electric rate gives eligible customers discounted energy prices for up to five years. Economic Development Rate could fall in the range of 3.7 to 5.0 cents per kilowatt hour. Must have:

- new or additional load of 1 megawatt or greater with a monthly load factor of 60 percent or greater.
- have entered into a written agreement with the state or any political subdivision to provide an economic development project pursuant to state or local law.
- wholesale customer and end-use customer have entered into a written service agreement with NPPD.

“NPPD's wholesale economic development rate offers new or expanding businesses an energy solution to grow and prosper in Nebraska.”

Patrick L. Pope, President & CEO
Nebraska Public Power District

Need Help?

Contact **Brian Vasa**, NPPD Economic Development Consultant at
(308) 289-0382
or by email at
bkvasa@nppd.com
for assistance in understanding the benefits of these programs and to help guide you through the process.



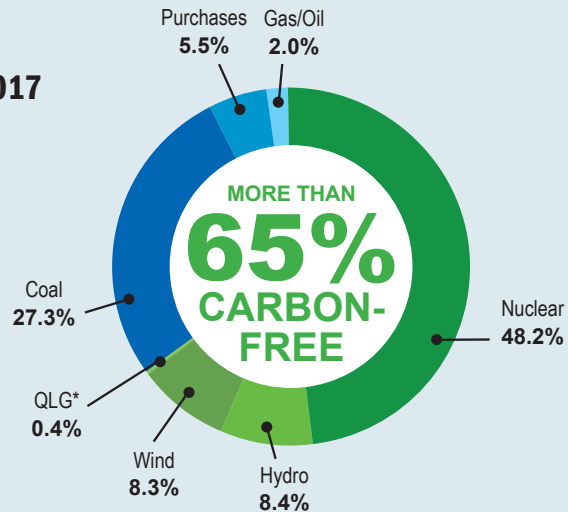
Nebraska Public Power District
Always there when you need us

0AE11917

Appendix A

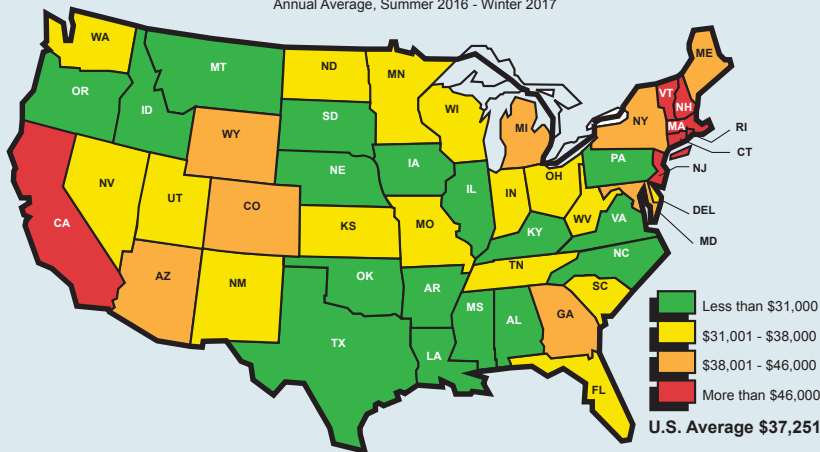
NPPD ENERGY GENERATION RESOURCES - 2017 (Nebraska Customers)

*Qualifying Local Generation (QLG) includes renewable energy facilities installed by our wholesale customers and in NPPD retail communities.



Electric Costs for Industrial Service, Summer 2016 - Winter 2017

Average Monthly Bills
Billing Demand - 1,000 kW
Consumption - 400,000 kWh
Annual Average, Summer 2016 - Winter 2017



SOURCE:

Edison Electric Institute, "Typical Bills and Average Rates Report," July 1, 2016 and January 1, 2017. State averages are weighted using eight months of July 2016 data and four months of January 2017 data. Nebraska data represent the average for Omaha Public Power District, Lincoln Electric System, and Nebraska Public Power District using the same seasonal weighting.

Nebraska Ranks Among the Best!

2017 Governor's Cup (most qualifying new and expanding facilities per capita) Site Selection - 2nd consecutive year

Best in U.S. - Power Grid Reliability, U.S. News & World Report, 2018

2nd State Fiscal Solvency, George Mason University, 2016

4th Best States for Business, Forbes, 2017

4th Regulatory Environment, Forbes, 2017

6th Quality of Life, Forbes, 2017

7th Business Costs, Forbes, 2017

Top 15 States for Cost of Living and Doing Business, CNBC, 2016

Nebraska

Good Life. Great Location.

Appendix B



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for **Hall County, Nebraska**

Southern Power District



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hall County, Nebraska
Survey Area Data: Version 18, Oct 5, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 18, 2015—Feb 3, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

Other

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3182	Jansen fine sandy loam, overblown, leveled	121.1	63.5%
8845	Hall silt loam, sandy substratum, 0 to 1 percent slopes	55.1	28.9%
8874	Hord silt loam, sandy substratum, 0 to 1 percent slopes	5.3	2.8%
8960	Wood River silt loam, 0 to 1 percent slopes	6.6	3.4%
8963	Wood River-Silver Creek silt loams, 0 to 1 percent slopes	2.6	1.3%
Totals for Area of Interest		190.7	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it

was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Hall County, Nebraska

3182—Jansen fine sandy loam, overblown, leveled

Map Unit Setting

National map unit symbol: 1v24q
Elevation: 1,000 to 3,000 feet
Mean annual precipitation: 24 to 26 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 150 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Jansen, overblown, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Jansen, Overblown

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy eolian deposits over loamy alluvium over sandy and gravelly alluvium

Typical profile

A1 - 0 to 7 inches: fine sandy loam
A2 - 7 to 13 inches: fine sandy loam
Ab - 13 to 17 inches: loam
Btb1 - 17 to 27 inches: clay loam
Btb2 - 27 to 32 inches: clay loam
BCb - 32 to 38 inches: coarse sandy loam
2Cb - 38 to 80 inches: stratified gravelly coarse sand to coarse sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Available water storage in profile: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: Sandy Medium P.Z. 17-22 P. Z. Provisional (R065XY032NE)
Other vegetative classification: Sandy 17-22" P.Z. (065XY032NE_2)

Hydric soil rating: No

Minor Components

Boelus, sandy substratum

Percent of map unit: 10 percent
Landform: Sand sheets on stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Ortello, loamy substratum

Percent of map unit: 8 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Sandy (R071XY054NE)
Hydric soil rating: No

Hall, sandy substratum

Percent of map unit: 2 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Silty Lowland - Veg. zone 3 (071XY050NE_2)
Hydric soil rating: No

8845—Hall silt loam, sandy substratum, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 1v240
Elevation: 1,000 to 3,500 feet
Mean annual precipitation: 24 to 26 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 150 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Hall, sandy substratum, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hall, Sandy Substratum

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear

Custom Soil Resource Report

Across-slope shape: Linear

Parent material: Fine-silty loess over sandy alluvium

Typical profile

Ap - 0 to 7 inches: silt loam

A - 7 to 18 inches: silt loam

Bt1 - 18 to 30 inches: silty clay loam

Bt2 - 30 to 47 inches: silty clay loam

2C1 - 47 to 60 inches: very fine sandy loam

2C2 - 60 to 80 inches: stratified fine sand to coarse sand to sand

Properties and qualities

Slope: 0 to 1 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 5 percent

Available water storage in profile: High (about 11.6 inches)

Interpretive groups

Land capability classification (irrigated): 1

Land capability classification (nonirrigated): 2c

Hydrologic Soil Group: C

Ecological site: Loamy Terrace (R075XY050NE)

Other vegetative classification: Silty Lowland - Veg. zone 3 (071XY050NE_2)

Hydric soil rating: No

Minor Components

Brocksburg

Percent of map unit: 5 percent

Landform: Stream terraces

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Loamy Upland (R071XY036NE)

Other vegetative classification: Silty - Veg. zone 3 (071XY058NE_2)

Hydric soil rating: No

8874—Hord silt loam, sandy substratum, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2tmky

Elevation: 1,300 to 3,180 feet

Mean annual precipitation: 21 to 27 inches

Mean annual air temperature: 48 to 52 degrees F

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Frost-free period: 137 to 167 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Hord, sandy substratum, and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hord, Sandy Substratum

Setting

Landform: Stream terraces

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Side slope, tread

Down-slope shape: Linear, concave

Across-slope shape: Linear

Parent material: Loamy alluvium over sandy and gravelly alluvium

Typical profile

Ap - 0 to 20 inches: silt loam

Bw - 20 to 36 inches: silt loam

C - 36 to 46 inches: silt loam

2C - 46 to 79 inches: gravelly coarse sand

Properties and qualities

Slope: 0 to 1 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 6 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 1

Land capability classification (nonirrigated): 2c

Hydrologic Soil Group: B

Ecological site: Loamy Lowland (R071XY028NE)

Hydric soil rating: No

Minor Components

Hall, sandy substratum

Percent of map unit: 5 percent

Landform: Stream terraces

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Loamy Lowland (R071XY028NE)

Hydric soil rating: No

Brocksburg

Percent of map unit: 5 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Loamy Lowland (R071XY028NE)
Hydric soil rating: No

Detroit, sandy substratum

Percent of map unit: 4 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Loamy Lowland (R071XY028NE)
Hydric soil rating: No

Aquolls, occasionally ponded

Percent of map unit: 1 percent
Landform: Depressions on stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: Wet Land (R071XY044NE)
Hydric soil rating: Yes

8960—Wood River silt loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 1v260
Elevation: 1,000 to 3,000 feet
Mean annual precipitation: 24 to 26 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 150 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Wood river and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wood River

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty alluvium

Typical profile

Ap - 0 to 7 inches: silt loam
A - 7 to 13 inches: silt loam
Bt1 - 13 to 19 inches: silty clay loam
Bt2 - 19 to 29 inches: silty clay loam
Btkn - 29 to 36 inches: silty clay loam
Bck - 36 to 56 inches: clay loam
2C - 56 to 80 inches: stratified coarse sand to gravelly coarse sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 99.0
Available water storage in profile: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: C
Ecological site: Saline Subirrigated (R071XY052NE)
Hydric soil rating: No

Minor Components

Hall, sandy substratum

Percent of map unit: 8 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Silty Lowland - Veg. zone 3 (071XY050NE_2)
Hydric soil rating: No

Silver creek

Percent of map unit: 5 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Microfeatures of landform position: Swales
Down-slope shape: Linear, concave
Across-slope shape: Linear
Ecological site: Saline Subirrigated (R071XY052NE)
Other vegetative classification: Saline Subirrigated - Veg. zone 3 (071XY047NE_1)
Hydric soil rating: No

Lamo, sand substratum, rarely flood

Percent of map unit: 2 percent

Landform: Flood plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Wet Subirrigated (R071XY045NE)

Other vegetative classification: Wet Subirrigated - Veg. zone 3 (075XY065NE_1)

Hydric soil rating: Yes

8963—Wood River-Silver Creek silt loams, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 1v262

Elevation: 1,000 to 3,000 feet

Mean annual precipitation: 24 to 26 inches

Mean annual air temperature: 50 to 54 degrees F

Frost-free period: 150 to 170 days

Farmland classification: Not prime farmland

Map Unit Composition

Wood river and similar soils: 55 percent

Silver creek and similar soils: 40 percent

Minor components: 5 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wood River

Setting

Landform: Stream terraces

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Silty alluvium

Typical profile

Ap - 0 to 6 inches: silt loam

BA - 6 to 12 inches: silty clay loam

Bt - 12 to 20 inches: silty clay loam

Btk - 20 to 36 inches: silty clay loam

Btkn - 36 to 50 inches: silty clay loam

BCK - 50 to 60 inches: clay loam

2C - 60 to 80 inches: coarse sand

Properties and qualities

Slope: 0 to 1 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

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Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 99.0
Available water storage in profile: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: Saline Subirrigated (R071XY052NE)
Hydric soil rating: No

Description of Silver Creek

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Microfeatures of landform position: Swales
Down-slope shape: Linear, concave
Across-slope shape: Linear
Parent material: Silty alluvium

Typical profile

Ap - 0 to 8 inches: silt loam
BAk - 8 to 14 inches: silty clay loam
Btkn1 - 14 to 18 inches: silty clay
Btkn2 - 18 to 30 inches: silty clay
Btkn3 - 30 to 41 inches: silty clay
Ab - 41 to 48 inches: silty clay
Bwb - 48 to 59 inches: clay loam
2Cb - 59 to 64 inches: stratified fine sandy loam to loamy sand to loam
3Cgb - 64 to 80 inches: gravelly coarse sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 48 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 30 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Very slightly saline to strongly saline (2.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 20.0
Available water storage in profile: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 4s

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Hydrologic Soil Group: D

Ecological site: Saline Subirrigated (R071XY052NE)

Other vegetative classification: Saline Subirrigated - Veg. zone 3
(071XY047NE_1)

Hydric soil rating: No

Minor Components

Hall, sandy substratum

Percent of map unit: 5 percent

Landform: Stream terraces

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Other vegetative classification: Silty Lowland - Veg. zone 3 (071XY050NE_2)

Hydric soil rating: No

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Appendix C

