



**City of Beulah North Dakota**



**2038 comprehensive plan**



Adopted on: \_\_\_\_\_

## ACKNOWLEDGEMENTS

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**City of Beulah | North Dakota**  
**Comprehensive Plan 2038**



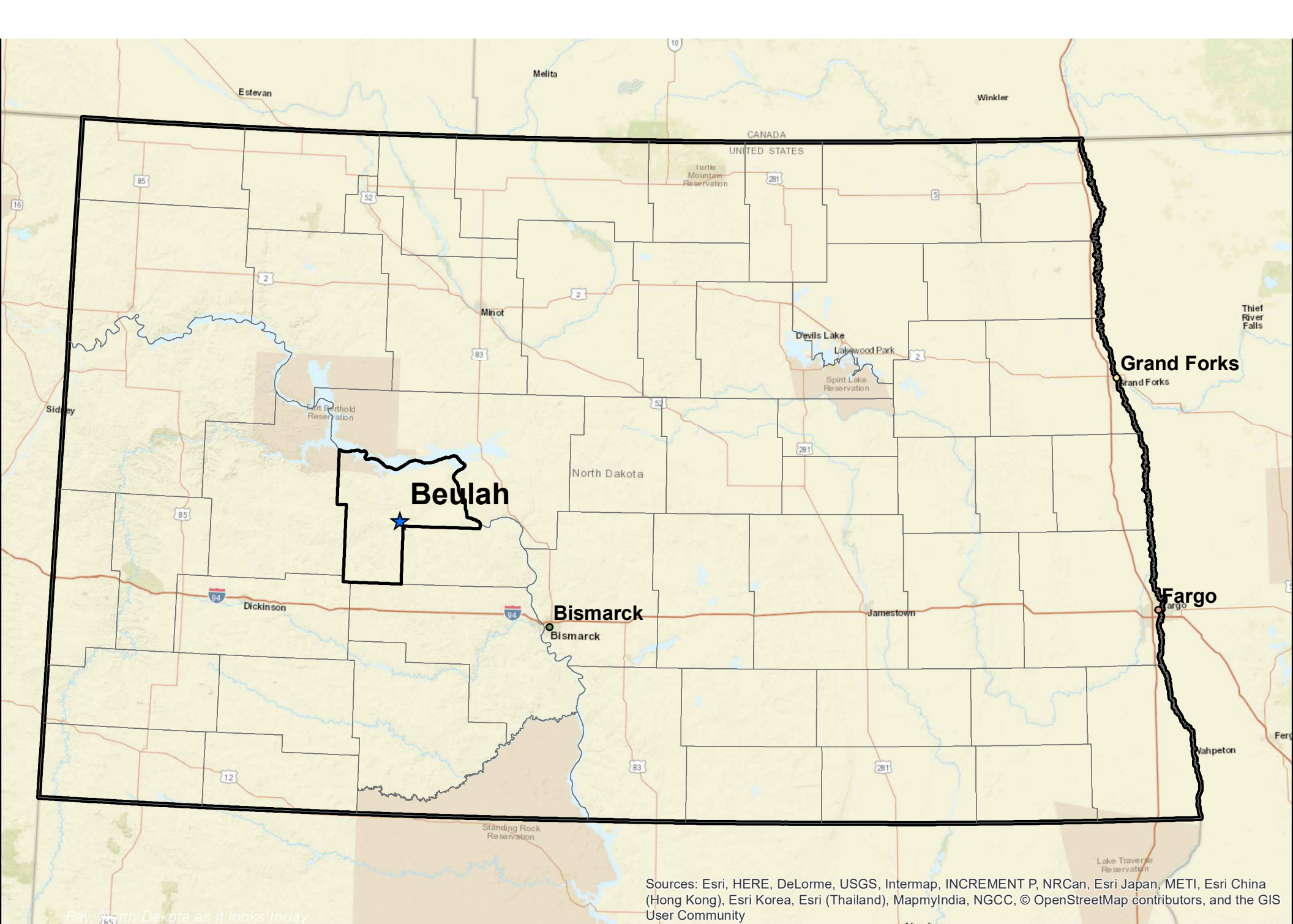
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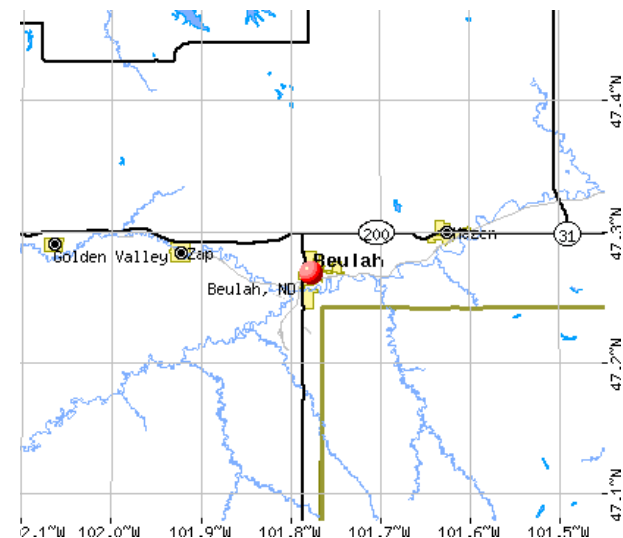
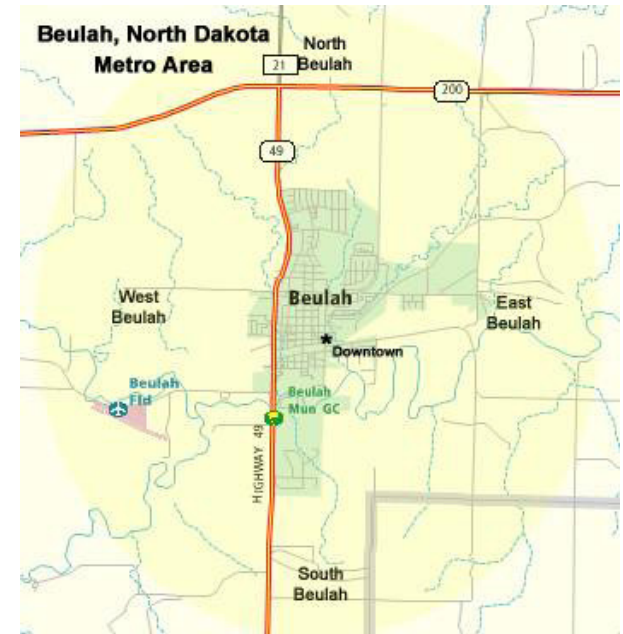


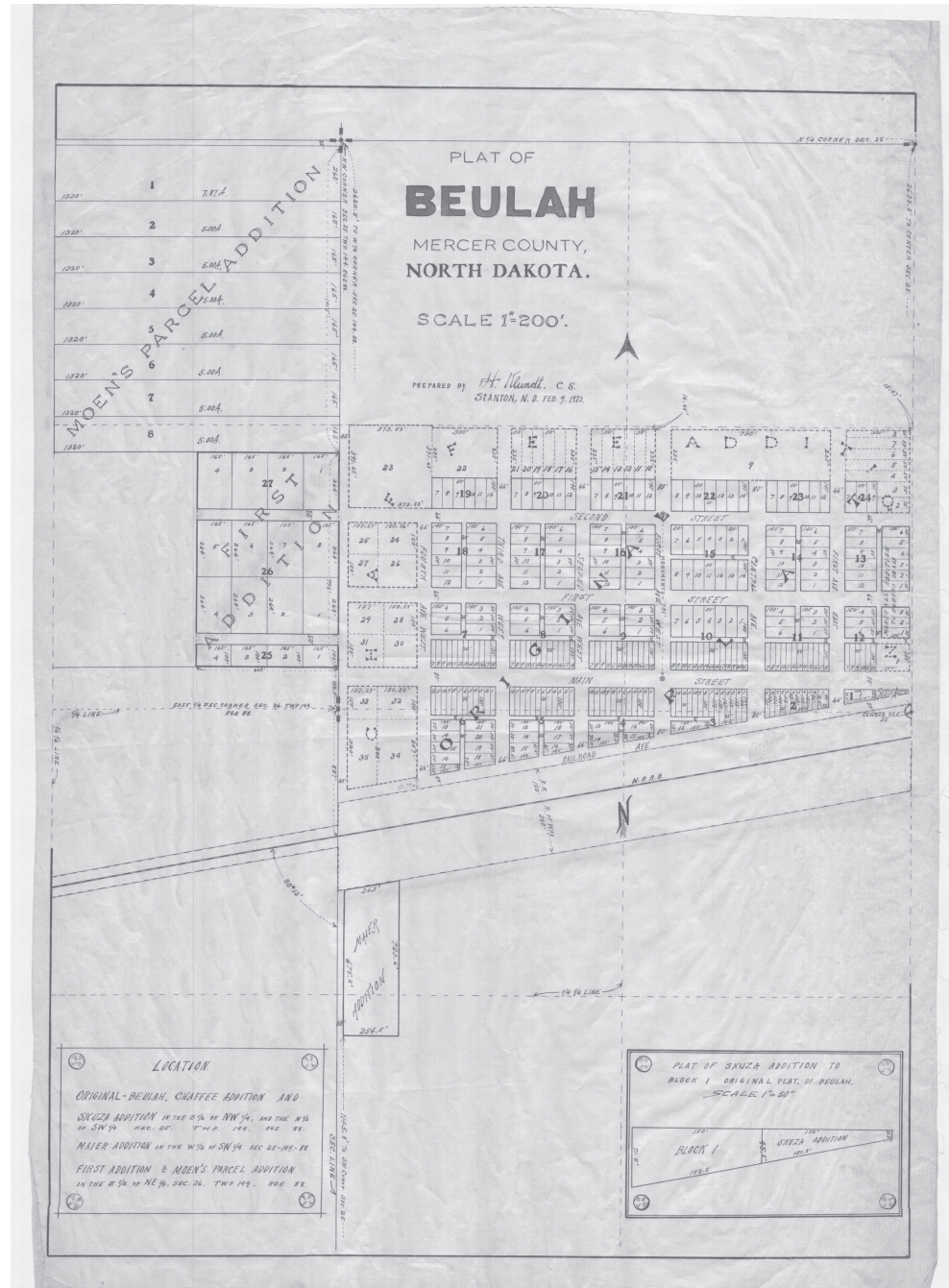
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# INTRODUCTION

The City of Beulah is the largest city in Mercer County, ND, and is located in the west central part of the State of North Dakota. The City recognized the need to update the existing plan, which was adopted in 2004, in order to ensure it encapsulated the present and future needs into their growth policy decisions. This document serves to provide decision makers guidance regarding land-use, economic development, and investments in infrastructure. It also identifies several priorities identified through the public engagement process.





## **Comprehensive Planning Process**

Why Plan? A comprehensive plan allows a city, county, or township to encapsulate how it would like to change over time. This is typically done by identifying issues that are presently affecting the area that are undesirable and coming up with a strategy to make incremental changes through land-use and other policy decisions that bring the municipality closer to where it would like to be in several decades. It is long-range, forward thinking, which allows a city to have large scale goals too complicated or expensive to tackle in a short time frame. Comprehensive plans commonly look forward approximately 20-30 years and may delineate shorter-terms goals in the interim. This plan looks forward 20 years to the year 2038.





# DEMOGRAPHIC & SOCIOECONOMIC DATA

## Employment (Mercer County)

Beulah is inherently tied to energy and related extraction industries. In Mercer County, employment is heavily concentrated in these two sectors, with a concentration more than 65 times what would be expected to be found in

a similarly sized economy. While the industry provides higher than normal wages and certainly bolsters the income of many residents, the lack of diversity within the economy has its drawbacks. Being overly dependent on one facet of the economy creates risk of disproportionate consequences in the event of an industry-

specific downturn. This is something Beulah has faced historically in the last several decades, with population and investment in the area booming and subsequently constraining as the world energy market fluctuated significantly in the 70s and 80s.

Table 1: Mercer County Employment, 3rd Quarter 2017<sup>1</sup>

NAICS Sector	September Employment	Average Weekly Wage
NAICS 11 Agriculture, forestry, fishing and hunting	8	\$ 1,289
NAICS 21 Mining, quarrying, and oil and gas extraction	568	\$ 2,151
NAICS 22 Utilities	1298	\$ 1,813
NAICS 23 Construction	1013	\$ 1,733
NAICS 31-33 Manufacturing	17	\$ 380
NAICS 42 Wholesale trade	92	\$ 960
NAICS 44-45 Retail trade	382	\$ 511
NAICS 48-49 Transportation and warehousing	34	\$ 1,132
NAICS 51 Information	87	\$ 1,253
NAICS 52 Finance and insurance	113	\$ 774
NAICS 53 Real estate and rental and leasing	6	\$ 282
NAICS 54 Professional and technical services	58	\$ 976
NAICS 56 Administrative and waste services	49	\$ 742
NAICS 71 Arts, entertainment, and recreation	32	\$ 212
NAICS 72 Accommodation and food services	267	\$ 272
NAICS 81 Other services, except public administration	71	\$ 458

1. Bureau of Labor Statistics Quarterly Census of Employment and Wages (QCEW) program, 3rd Quarter 2017

## Population

The City of Beulah has gone through substantial population shifts in the last 50-60 years, more than doubling in population between 1970 and 1980 directly related to growth in the energy and extraction industries. In contrast, a contraction in these same industries saw population decline slightly between 1990 and 2010. Since

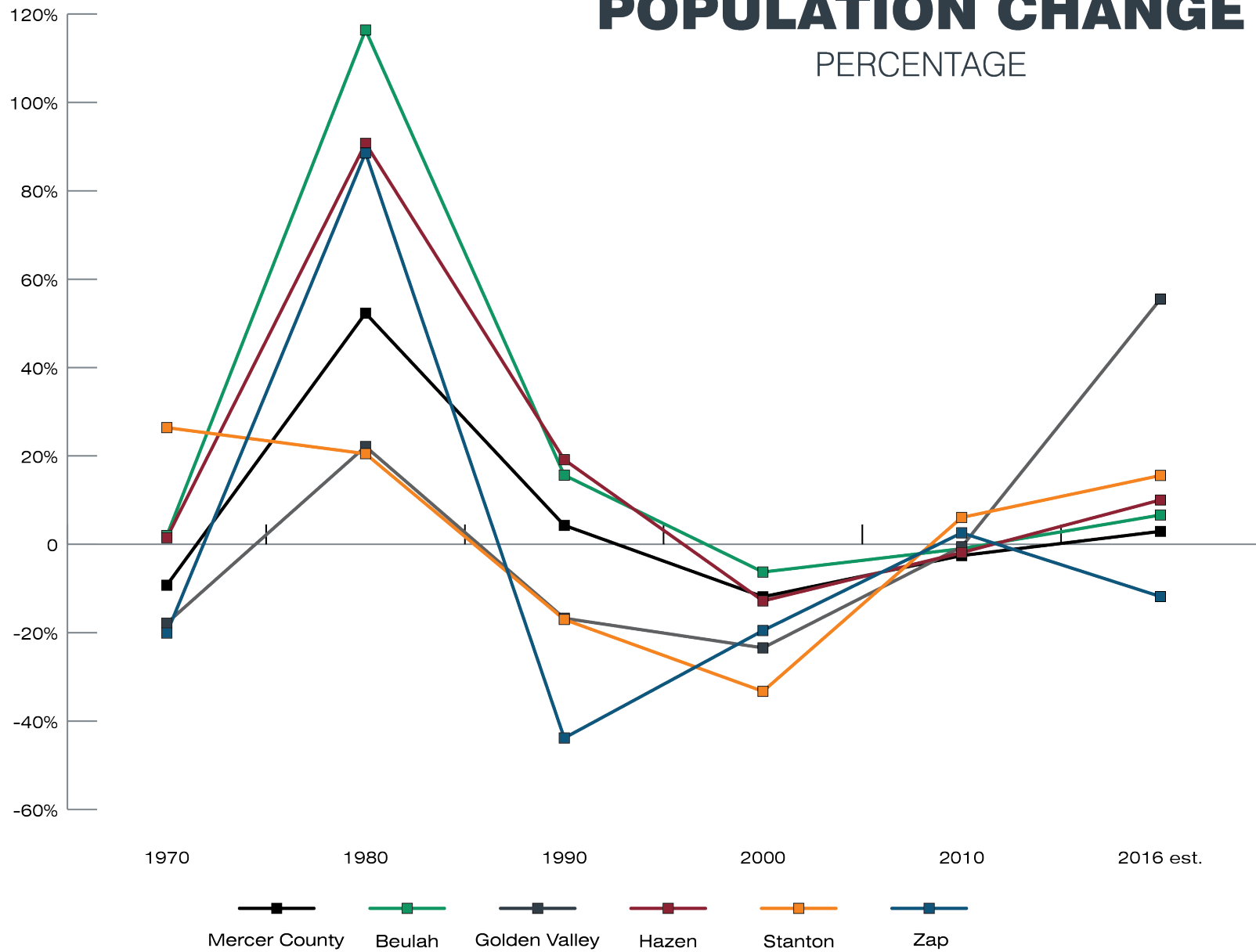
that time, the City of Beulah has experienced another growth in population tied to market shifts. The City of Beulah has continually grown to secure a larger concentration of the entire population of Mercer County. In 1960, the City of Beulah accounted for slightly more than 19 percent of the population and as of 2016 had twice the concentration at 38 percent.

	1960	1970	1980	1990	2000	2010	2016 est.
Mercer County	6805	6175	9404	9808	8644	8424	8671
City of Beulah	1318	1344	2908	3363	3152	3121	3328
City of Golden Valley	286	235	287	239	183	182	283
City of Hazen	1222	1240	2365	2818	2457	2411	2653
City of Stanton	409	517	623	517	345	366	423
City of Zap	339	271	511	287	231	237	209
<b>Beulah as Percentage of Total</b>	19.36%	21.77%	30.92%	34.29%	36.46%	37.05%	38.38%
<b>Hazen as Percentage of Total</b>	17.96%	20.09%	25.15%	28.73%	28.42%	28.62%	30.60%



# POPULATION CHANGE

## PERCENTAGE



## Age

The City of Beulah maintains a higher median age than many other cities in Mercer County at 44.9. The only two cities that maintain higher median ages are the City of Stanton and City of Zap at 48.6 and 52.8 respectively. The median age is also much higher than the State of North

Dakota's at 35.2. The largest concentration of the population reside in the 45-59 age range, accounting for approximately 27% of the population.

### MEDIAN AGE

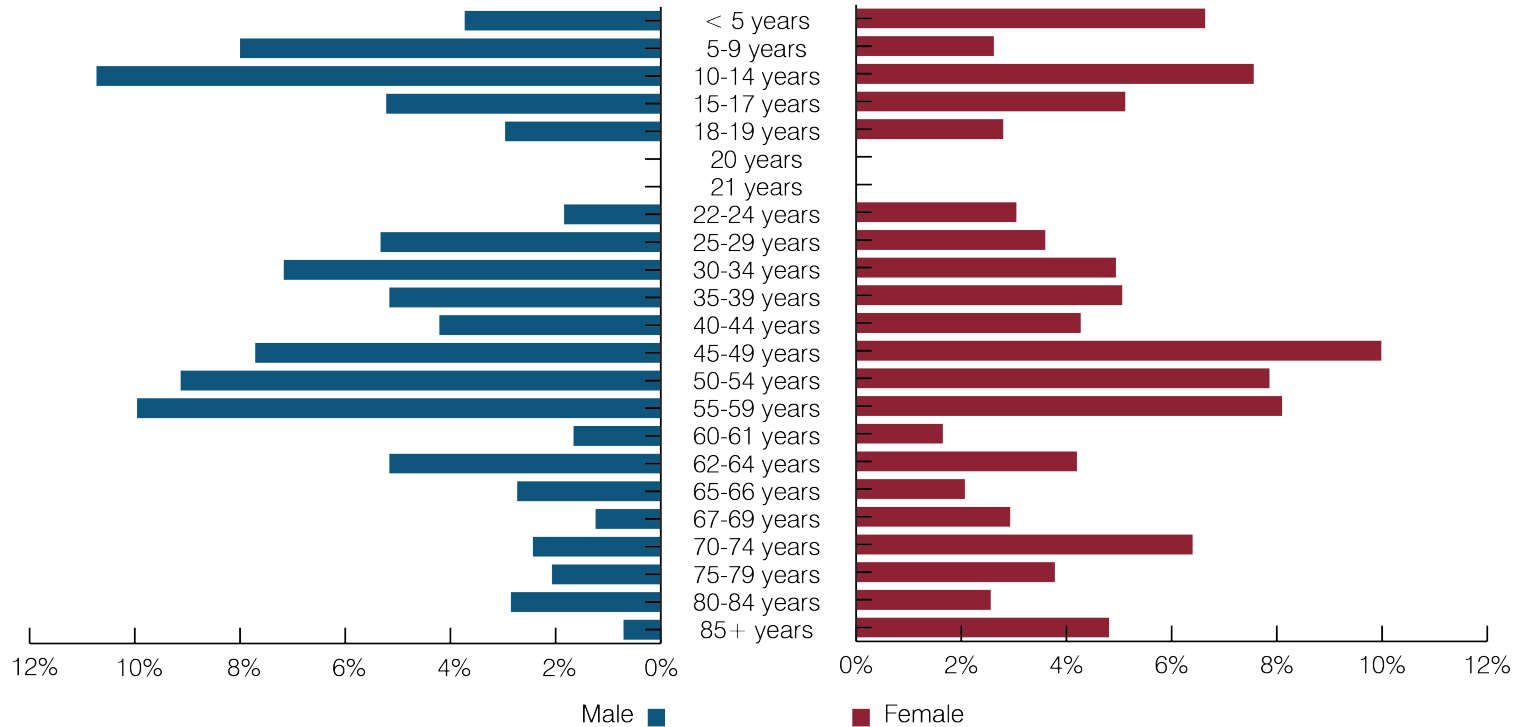
# 44.9

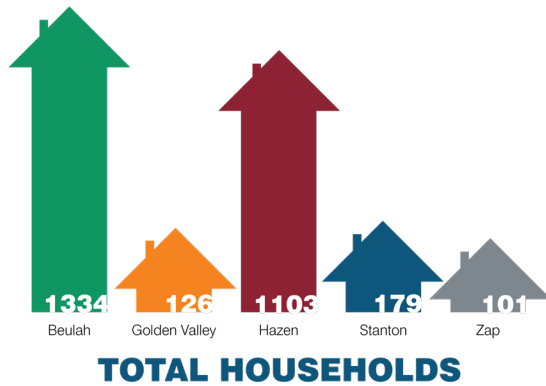
City of Beulah

<b>44.5</b>	Mercer County
<b>43.4</b>	City of Golden Valley
<b>35.8</b>	City of Hazen
<b>48.6</b>	City of Stanton
<b>52.8</b>	City of Zap
<b>35.2</b>	North Dakota

## Beulah Population

Age & Gender

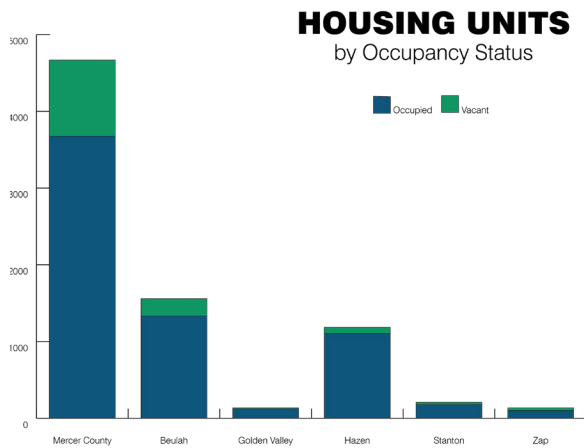




### Household

As with population, the City of Beulah has the most households in Mercer County at 1,334. This accounts for 85% of the number of housing units in Beulah, where 225 units remain vacant. Median housing values in the City of Beulah are the highest in the region at \$157,500, but still well below the \$183,900 for the State as a whole. Approximately 50 residential permits have been issued over the past five years.

	Total	Occupied	Vacant	Occupied %	Vacant %
Mercer County	4667	3675	992	78.74%	21.26%
City of Beulah	1559	1334	225	85.57%	14.43%
City of Golden Valley	136	126	10	92.65%	7.35%
City of Hazen	1188	1103	85	92.85%	7.15%
City of Stanton	210	179	31	85.24%	14.76%
City of Zap	136	101	35	74.26%	25.74%



### MEDIAN HOUSING VALUE

**\$157,500**  
City of Beulah

- \$152,200** Mercer County
- \$85,000** City of Golden Valley
- \$146,700** City of Hazen
- \$90,700** City of Stanton
- \$97,000** City of Zap



## Income

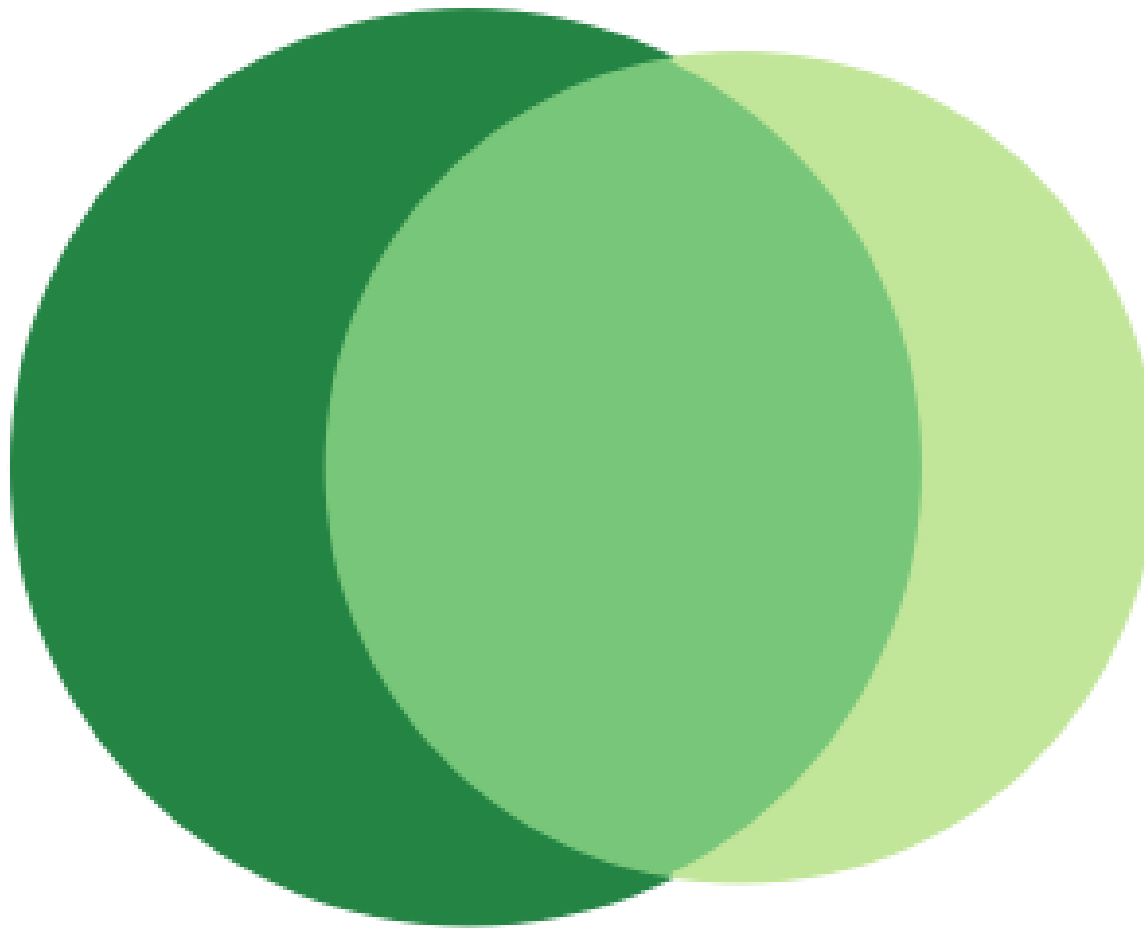
Median household income in the City of Beulah is \$76,042, approximately \$17,000 more than the State's at \$59,114. Wages are substantially higher for workers in the surrounding energy and extraction facilities compared with other sectors of the local economy.

MEDIAN INCOME  
**\$76,042**  
City of Beulah

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<b>\$73,801</b>	Mercer County
<b>\$75,500</b>	City of Golden Valley
<b>\$77,275</b>	City of Hazen
<b>\$62,917</b>	City of Stanton
<b>\$39,375</b>	City of Zap

## Inflow/Outflow Job Counts in 2015 Workers Earning More than \$3,333 per month



### Commuting Patterns

Nearly half of workers with higher paying jobs commute into Mercer County from outside the area. In discussion with area residents and city staff, it is known that many employees working in the energy and extraction industries reside in the Bismarck-Mandan area approximately one hour away to take advantage of area amenities or because spouses have a difficult time obtaining a position of similar quality and pay in Beulah. As of 2015, more than 760 workers from the Bismarck-Mandan area work in or around Beulah.

<span style="display:inline-block; width:15px; height:15px; background-color:#1a7850; border:1px solid black;"></span>	1,332 - Employed in Selection Area, Live Outside
<span style="display:inline-block; width:15px; height:15px; background-color:#c8e6c9; border:1px solid black;"></span>	820 - Live in Selection Area, Employed Outside
<span style="display:inline-block; width:15px; height:15px; background-color:#81c784; border:1px solid black;"></span>	1,524 - Employed and Live in Selection Area

# PUBLIC ENGAGEMENT

Public engagement was a substantial component of the creation of this plan. Focus groups and public meetings were held to identify key issues within the city and establish goals, objectives, and policies to address these concerns incrementally through land-use and economic development policy decisions.

## Public Meetings

Two public meetings were held to allow residents to express their praises and concerns for the City of Beulah. At the first meeting, residents were asked to write down their response to several questions and encouraged to mark areas on an oversized map of the city where they felt certain types of development were more appropriate. The questions asked of residents were:

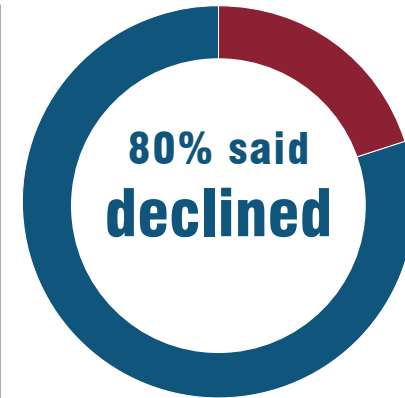


Town Hall Meeting, March 2018

## Quality of Life

Over the past five years, how do you believe Beulah's quality of life has changed?

- 0% Improved
- 20% Stayed the Same
- 80% Declined



## Top 3 Critical Issues

What do you see as the top 3 critical issues facing Beulah?

- 1 Taxes**
- 2 Building Improvements Vacancies**
- 3 Economic Diversity**



What do you love about Beulah?

1. Safety
2. Quietness
3. Low Traffic
4. Friendly People

## Beulah Needs...

What would make the community even better?

1. Activities for All Ages
2. Community Events
  - Crazy Days
  - Street Dances
3. Places to Eat
4. Indoor Play
  - Playground
  - Swimming Pool
5. Reopen Grandview
6. Reopen Bowling Alley

Perspective on change in quality of life over the last five years was largely negative, with 80 percent of respondents indicating that it had declined. Taxes and the state of some buildings and corresponding vacancies topped the list of critical issues. The lack of economic diversity was a recurring theme in both focus group and public input meeting discussions. The community recognizes the importance of the energy and extraction industries and that diversification is a strategy that should be pursued to create a more robust economy overall.

The condition of downtown was a topic that was discussed at length by several attendees and there was agreement that it should receive special focus moving forward. Residents strongly desire more entertainment within the city itself. Additional restaurants, indoor play areas or pools, and events are all things that residents are eager to experience.

The school system and sense of community were strong sources of pride for Beulah residents. The safe, quiet, and friendly people are why residents care so much about their town.

## Memorable & Unique

What makes Beulah memorable and unique and why?

1. Sense of Community
2. School System

## Improvements & Changes

What could be changed and where?

1. Dilapidated Building Concerns
2. Walking/Bike Paths
3. Main Street Focus
  - Downtown Life
  - Shops
  - Places to Eat

## Make Beulah Stand Out

How can we make our community a place of interest moving forward?

1. More Things To Do
  - Community Eve
  - Places to Go
2. Expanded Store Hours

## March 20 Updated Information

Residents were provided with the results from the questions asked of them at the previous meetings and asked to amend or add to what was already identified. In addition, the preliminary DRAFT future land use map was on display and discussions with residents on areas they felt were accurately/inaccurately depicting uses was key. On the map, changes were made by shading or redrawing new boundaries and these adjustments were made, where necessary, to create the FINAL land use map included in this plan.



## Focus Groups

Five focus groups were held to ensure certain economic and social areas received special focus. These were the Beulah Chamber, which represented business interests in general, parks, schools, and the medical and finance industries.

Each of the focus groups participated in a SWOT analysis, which identifies the area strengths, weaknesses, opportunities, and threats. From this information, the group identifies priorities that are listed in the order of most importance.

The City of Beulah may not be able to directly accomplish all of the priorities listed, although it is in a position to help motivate and facilitate agencies, organizations, and residents better positioned to tackle the problem.

## Chamber

Local business owners and representatives comprised the make-up of the Beulah Chamber focus group. The amount of locally owned businesses was deemed the areas greatest strength, with the group also touting the school system as a substantial asset to the community.

In contrast, the Beulah Chamber noted that existing economic development efforts were constrained by differing views and an overall lack of communication. The relationship



between the Chamber and City of Beulah was noted as both an opportunity and threat to business/economic development.

### Priorities

1. Rebuilding relationship with city
  - Liaison of Chamber for city – ex-officio member on various committees / commissions
2. Chamber-based encouragement of citizen involvement in civil service (office)
3. Utilize modern mediums to communicate Chamber information
  - Create app that provides everything that's going on in Beulah
4. Economic development – focus on retail, food service, trades



## Finance

The finance focus group was composed of several individuals from a number of lending institutions in the area. The greatest strength noted was the tight-knit relationships between each of the lending firms, with the ability to partner with each other and provide more options to area residents and business owners.

The relative cost of housing to available amenities and dependence on the extraction and energy industries were determined to be the greatest threats to area long-term stability. The in-migration of the working population from outside the area was identified as the greatest weakness. A lack of mid-level jobs and overall entertainment within the city were other aspects that require work.

## Priorities

1. Working with Bank of North Dakota and others to solicit value-added Ag. Services to help insulate from dependency on coal – diversification
2. Working together to work with potential daycare (Duplicate Hazen model)
3. 250 days of fun / activity per year
4. Lower taxes
5. Utilizing all financial resources available

## School

The Beulah School District is composed of an elementary, middle, and high school. The school focus group noted that supportive staff and small class sizes has allowed the school district to be a tremendous amenity for the community. Enrollment has recently been steady and provides predictability for teaching and administrative staff. With that, approximately 52% of students are tied to the energy and extraction industries through parent employment providing some threat to this stability should the market shift downward. Also, recruitment of school staff to Beulah has been difficult.

There is an overwhelming concern for the state of the high school and limitations on gym space, which is in high demand from many

non-academic organizations. Another concern is for non-academic/post-curricular activities afforded to students. Some of this concern may be addressed, in part, by the near-completion of the recreation center just south of the high school. This facility is likely to provide some activities for youth outside the school system.

*Priorities*

6. Continue working on HS repair/replacement plan.
7. Recruit/retain school staff.
8. Provide entrepreneurship/grow-your-own classes, job shadows, partnering with businesses.
  - Mimic Northern Cass model.
9. Work with recreation center to repair relationship and establish partnership.
10. Provide entertainment opportunities for students/young adults.

## Medical

The medical focus group indicated one of the greatest strengths within the area is the amount of collaboration that takes place with strong, dedicated leadership, and the overall stability of the industry as a whole. The payment structure in healthcare is a threat to this stability and the area is struggling with issues related to drug and alcohol abuse.

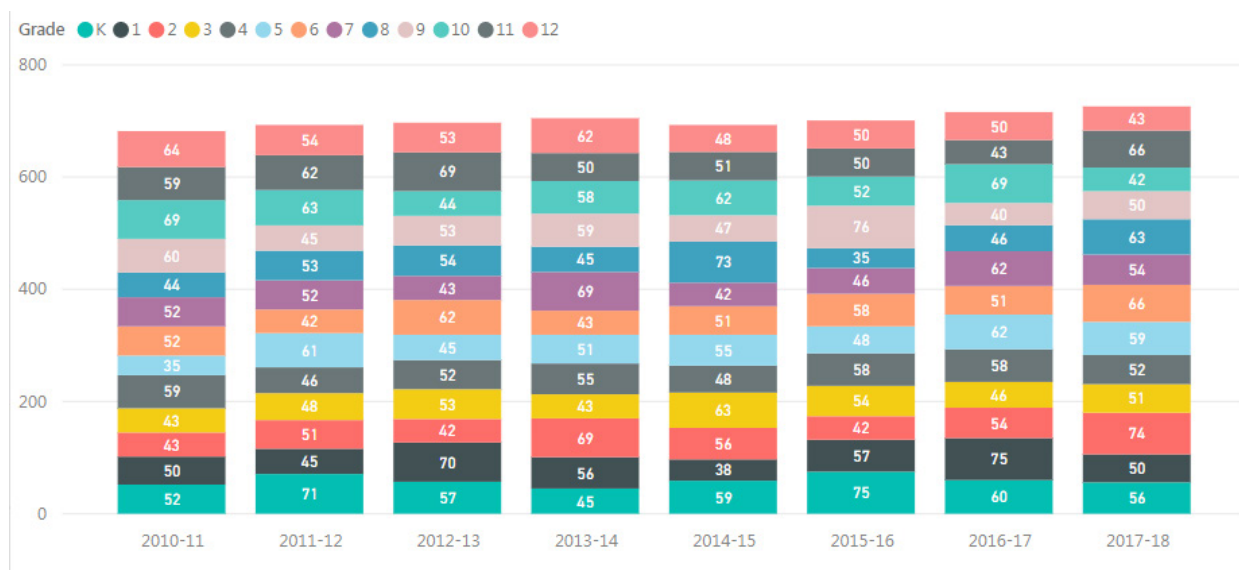


Figure 2: Enrollment by Academic Year and Grade

Retrieved from [mainstreetnd.com](http://mainstreetnd.com)

As with education, securing talent has been difficult and a lack of an assisted living facility means a gap in the continuum of care that may be provided in the area. A reliance on Bismarck or other areas for this type of care is necessary at this time.

*Priorities*

1. Establish a daycare to ease employee ability to work and draw new workforce to the area.
2. Establish an Assisted Living facility in the area to serve the regions elder care needs.
3. Continuation of workforce – sustainability

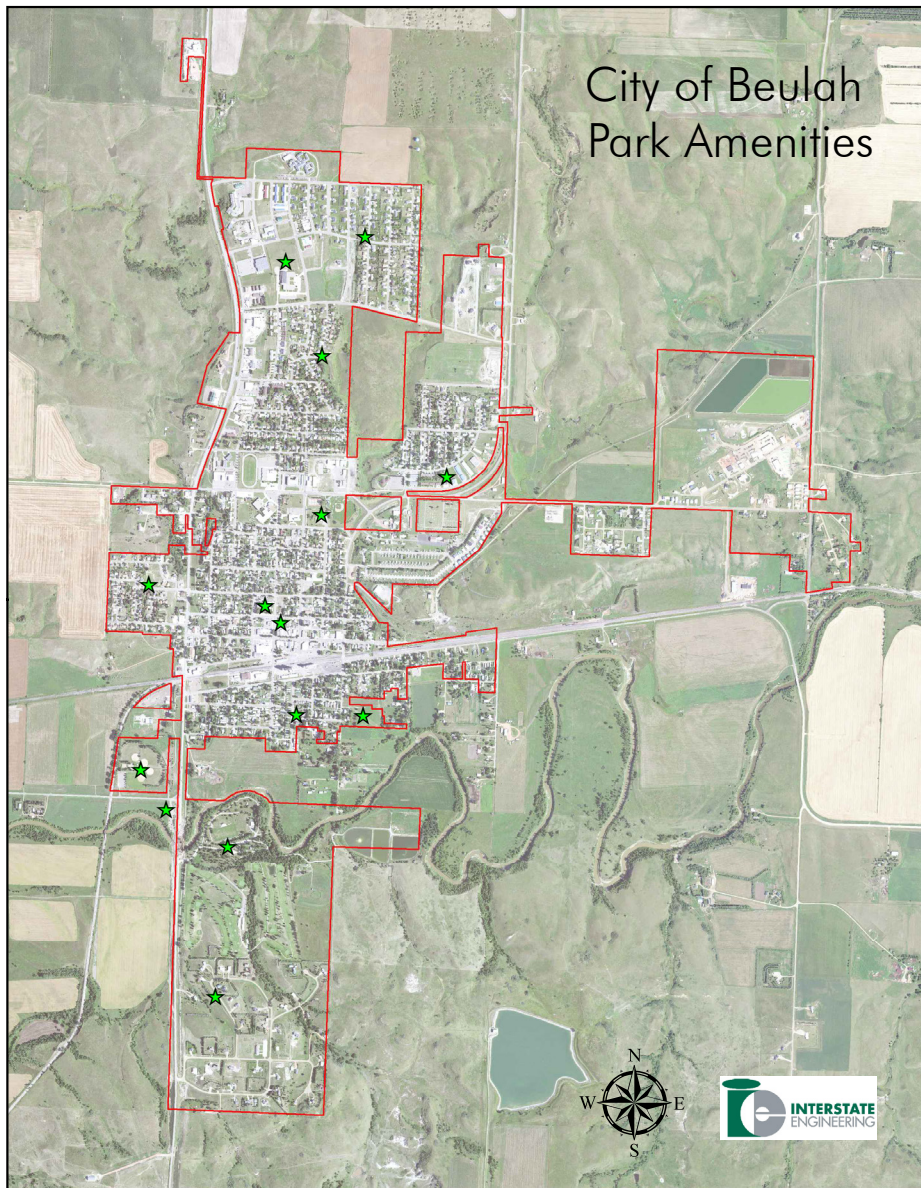
and new focus

4. Create a subcommittee of the Population Health Committee, such as an opioid task force.
5. Partnership with education / Expanding school wellness through pilot project
  - Providing behavioral health within school and later expanding to general population.

## Parks

The Beulah Parks District maintains multiple facilities throughout their district, the newest being the Energy Wellness Center nearing





completion just south of Beulah High School. The 30,000 sq. ft. facility is scheduled to open in April 2018 and was noted by focus group participants as a new area strength with regard to public recreation facilities. Its stability and sustainability will be directly attributed to resident and organizational participation.

In contrast, while many facilities have been improved the focus group indicated that there was still much to be done. Similar to the school focus group, parks indicated a need to coordinate with the school district and other agencies/organizations moving forward, which could create opportunities to provide diversity in activities to area residents.

#### *Priorities*

1. Ensure success of the new Wellness Center
  - Market/advertise on Facebook and social media
2. Improve communication with agencies (city/school) and organizations (booster)
  - Attend more meetings/be involved
3. Update and maintain parks through regular budget and grant opportunities
4. Maintain community support through special meetings/projects
5. Creative revenue generation
  - Diversification from county-only funding



# LAND USE & ECONOMIC DEVELOPMENT

The following chapter summarizes the wealth of information obtained from the public engagement process through the lens of land-use and economic development. Goals, objectives, and policies are provided to guide decision makers moving forward. Goals are broad and longer range in nature, with objectives being measurable milestones toward the achievement of the goal. Finally, policies provide guidance in decision-making that assist with the accomplishment of objectives.

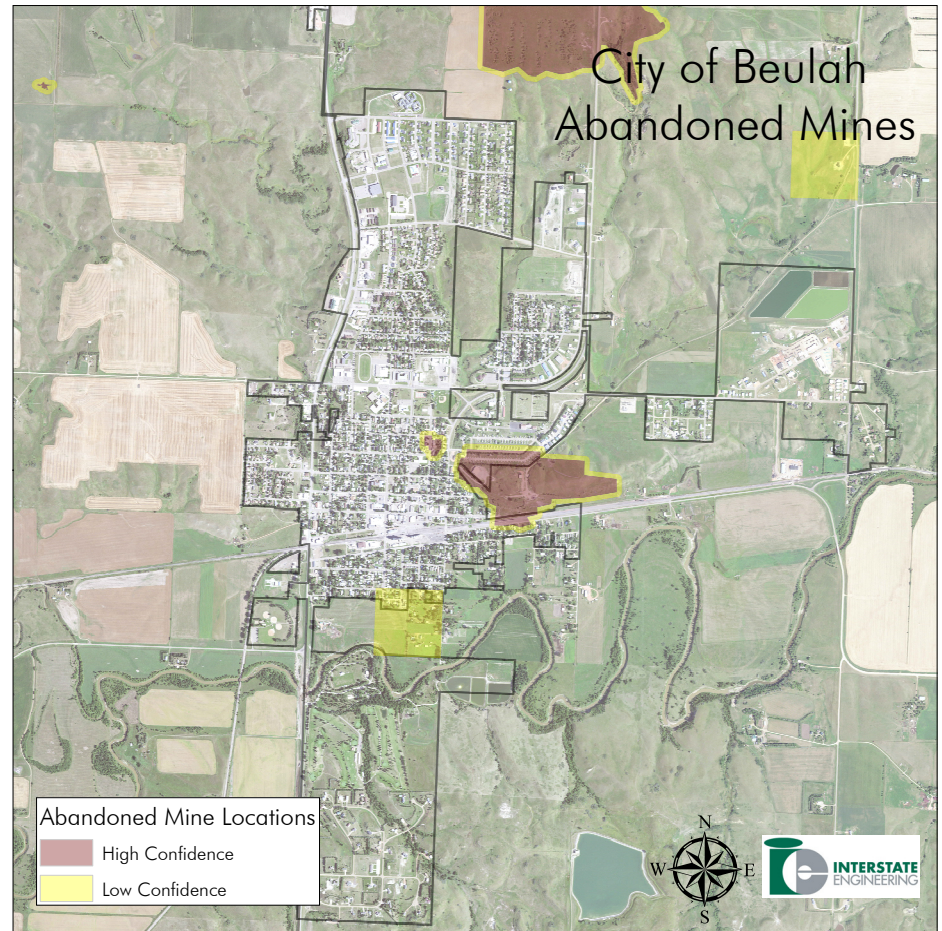
A future land use map is part of this comprehensive plan to guide development in certain areas of the city. In addition, a crosswalk provides a future land use designation that corresponds to each of the zoning districts.

As land use applications are received, the comprehensive plan is referenced to determine if the application aligns with the future land use map and goals, objectives, and policies. Through this process, the city can ensure that it moves towards its goals incrementally with each application.

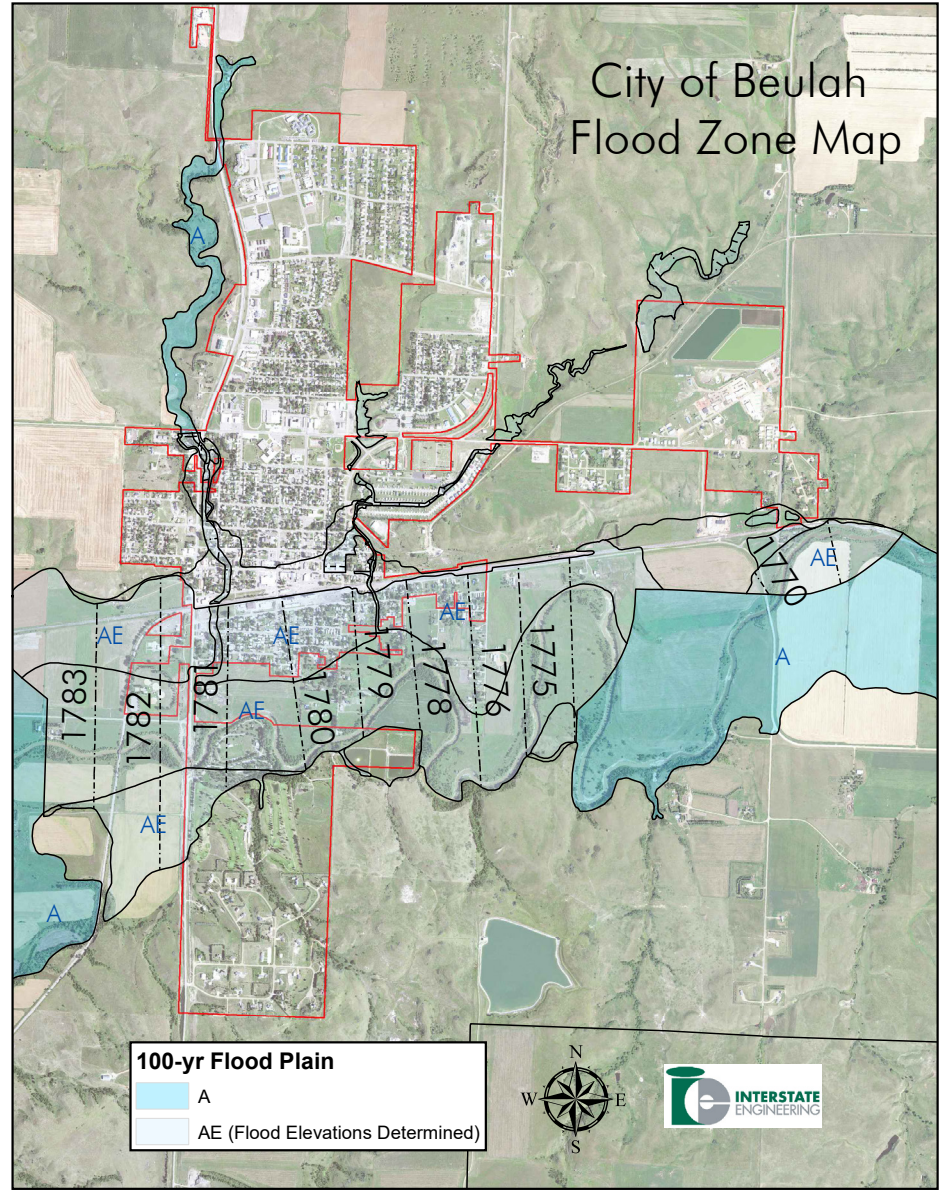
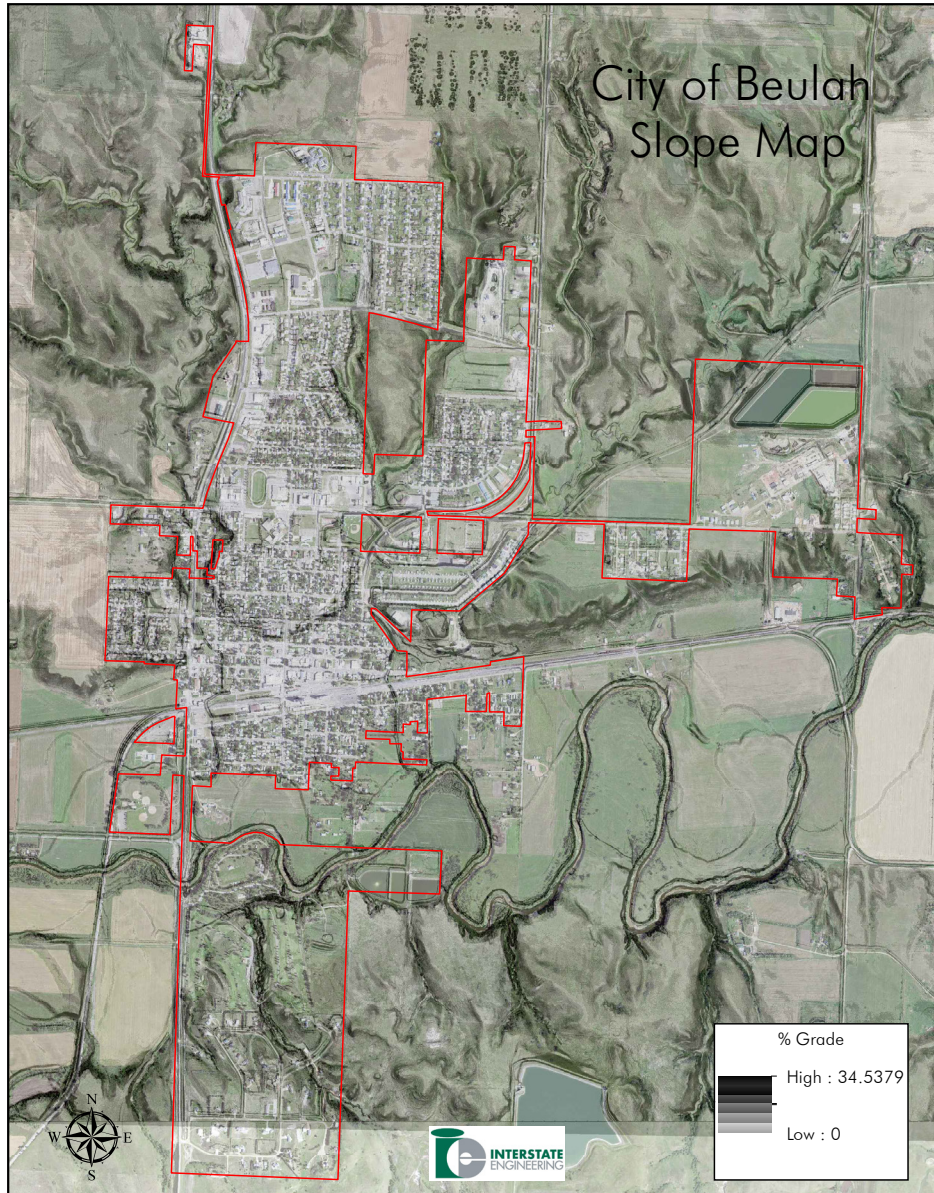
## Growth Pattern

Much of Beulah has grown without issues stemming from “leapfrog” development, or development with large expanses of open land between neighborhoods. There are a few exceptions, but these can primarily be explained by three major development hurdles:

- Historical mine locations
- The floodplain stemming from natural drainage and the Knife River
- Topography









When each of these development hurdles is reviewed, it is clear that outside of the residential development to the east, the city is fairly clustered.

There are only a few open lots peppered throughout the city that do not require expanded city infrastructure. These lots may be the by-product of the desire for an additional buffer between an existing home and the nearest neighbor and are not necessarily indicative of a lot intended to be improved. Regardless, there are select opportunities for infill that could be readily had and land use policies may restrict perpetuation of this activity moving forward.

### **Downtown**

Beulah residents and business owners alike share a passion for the current state of downtown. Dilapidated buildings, vacancies, and a lack of overall atmosphere/sense of place leave much to be accomplished over the next 20 years.

However, Beulah also has a unique opportunity to become an urban respite for the recreational enthusiasts that pass through on their way toward Lake Sakakawea which is approximately a 20 minute drive to the north.

Eateries, retail, and activities in downtown Beulah are relatively limited. Activities such as Crazy Days and Street Dancing have been cut

due to a lack of attendance and participation. However, these community events are very much desired by residents and business owners looking to see energy infused into their city. Whether special events or traditional dining and retail, there is demand for more avenues of entertainment throughout the year.

The City of Beulah is actively evaluating methods of downtown revitalization, specifically through application of Governor Burgum's Main Street Initiative. In 2013, the City of Beulah funded a study that evaluated methods to stimulate and revitalize the city's downtown. The study, Metamorphosis, presented several project opportunities and approaches to help facilitate a more active and vibrant downtown. Where possible, these policies have been incorporated

into the goals, objectives, and policies related to economic development.

The success of invigorating downtown Beulah will be the responsibility of multiple parties. Cities can only provide organization and funding of special activities if the related costs are supported by taxpayers and the events are adequately attended. It will require grassroots and top-down approaches to infuse life into downtown Beulah and make it a regional attraction on multiple fronts.

### **Goals, Objectives, and Policies**

In order to ensure the City of Beulah continues to remain clustered and attains vibrancy and resiliency, the following goals, objectives, and policies are provided:



## Land Use/Economic Development Goal #1:

To diversify the local economy, insulating the City of Beulah from the effects of world energy market fluctuations, while simultaneously supporting the energy and extraction industries.

### Objective A

Continue an active dialogue with primary representatives of the energy and extraction industries to identify methods the City of Beulah can implement to better facilitate and support the energy industry.

### Objective B

Market Beulah as a gateway to recreational activities and the premier urbanized respite for area tourists.

### Objective C

The city should work closely with the Chamber and CVB in identifying opportunities to support existing business expansion.

### Objective D

The Chamber and CVB should work closely with the City of Beulah to establish a holistic and cohesive approach to economic development related decision making.

#### Policy A

Economic development initiatives should focus on diversification and target non-energy industries that will allow Beulah to broaden its economic industry composition. Focal industries include food services, retail, and trades.

#### Policy B

The City of Beulah should identify areas where it can be supportive of the energy and extraction industries. For example, day-to-day processes at the city level that may delay opportunities for these industries should be identified and resolved, where possible.



## Land Use/Economic Development Goal #2:

To revitalize downtown Beulah, creating a sense of place and activity unique to the region.

### Objective A

Increase the number of days of activity in downtown Beulah to 250 per calendar year. Activities may be business, city, resident, or organizationally initiated. Scale will vary from a business-specific activity such as a contest to a large parade or festival.

### Objective B

Establish and uphold design guidelines to preserve the historic façade of existing buildings and to create minimum standards that increase the attractiveness and assessed value of downtown.

### Objective C

Establish a Renaissance Zone and identify other programs to provide private investment incentives for new/expanding businesses in downtown Beulah.

### Objective D

Establish outdoor seating area(s) in downtown that promote visible activity to passers-by.

### Objective E

Create a formal strategic downtown plan that drives decision making for downtown Beulah related to transportation, economic development, and land use.

### Objective F

A pathway system should be constructed that provides pedestrian and bike access to downtown.

### Policy A

Downtown should be recognized as the focal point for community events and retail and food service commercial activity in the City of Beulah.

### Policy B

Decisions related to downtown revitalization should incorporate area business input and strategies.

### Policy C

The City of Beulah, Chamber, and CVB will work together in identifying priorities for the revitalization of downtown.

### Policy D

The city should work with organizations, businesses, and the public to facilitate grassroots events and continually evaluate permitting or other processes that encumber the establishment of special activities by those interested in their creation.

### Policy E

The revitalization of downtown should be the responsibility of the community, including the city, businesses, residents, and organizations.

### Policy F

Eateries, fuel stations, and other tourism-related commercial developments should be opposed at the intersection of Hwy 49 and Hwy 200 to the north of the City of Beulah.

### Policy G

The city should continually take inventory of dilapidated structures and actively communicate with property owners toward remediation.

### Policy H

Diversity in signage should be encouraged that adds to a sense of place and simultaneously preserves the history of downtown Beulah.

## Land Use/Economic Development Goal #3:

The number of infill lots in the City of Beulah will be reduced.

### Objective A

Identify and take inventory of available infill opportunities throughout the City of Beulah.

### Objective B

Establish a dynamic 5-year Primary Development Area boundary that will direct development to remain closer to the existing city core and existing infrastructure.

### Objective C

Identify unique opportunities for those areas that maintain development-related hurdles, such as mines, floodplains, and steep topography.

### Objective D

Establish outdoor seating area(s) in downtown that promote visible activity to passers-by.

### Policy A

Developments outside the immediate periphery currently served by existing city infrastructure should be avoided.

### Policy B

To discourage sprawl, growth should be encouraged within the 5-year Prime Development Areas. The prime development areas should be updated every 1-2 years or as needed.

### Policy C

The Planned Unit Development (PUD) overlay district should be considered for infill opportunities. Any PUD applied to an infill lot should be generally supported or not opposed by neighboring property owners.

### Policy D

Prime Development Areas are those where services including power, water, sanitary sewer, storm sewer, and roads are readily available and city-specific investment either upfront or through post-construction maintenance is limited.

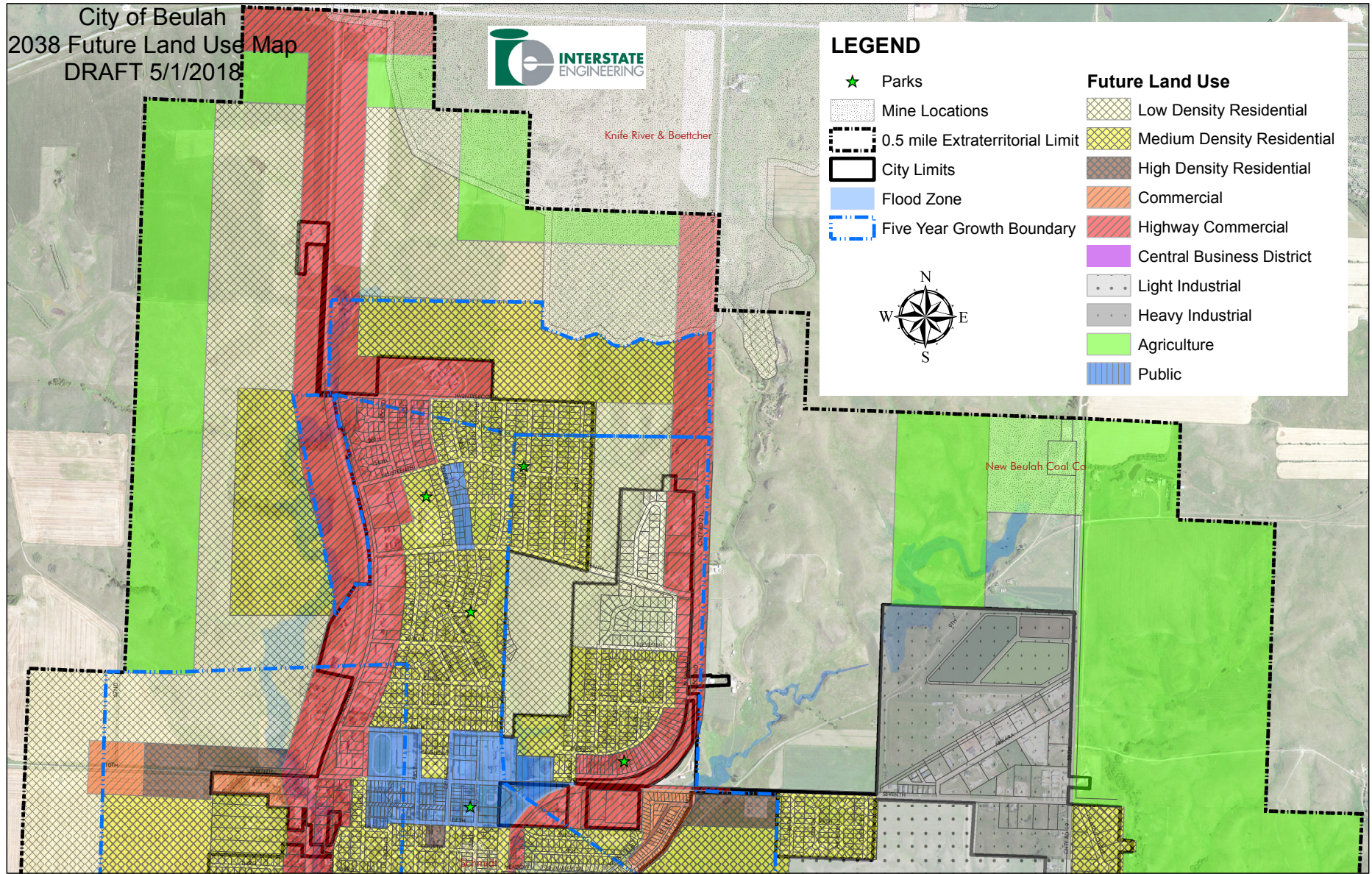


City of Beulah  
2038 Future Land Use Map  
DRAFT 5/1/2018



Knife River & Boetcher

New Beulah Coal Co

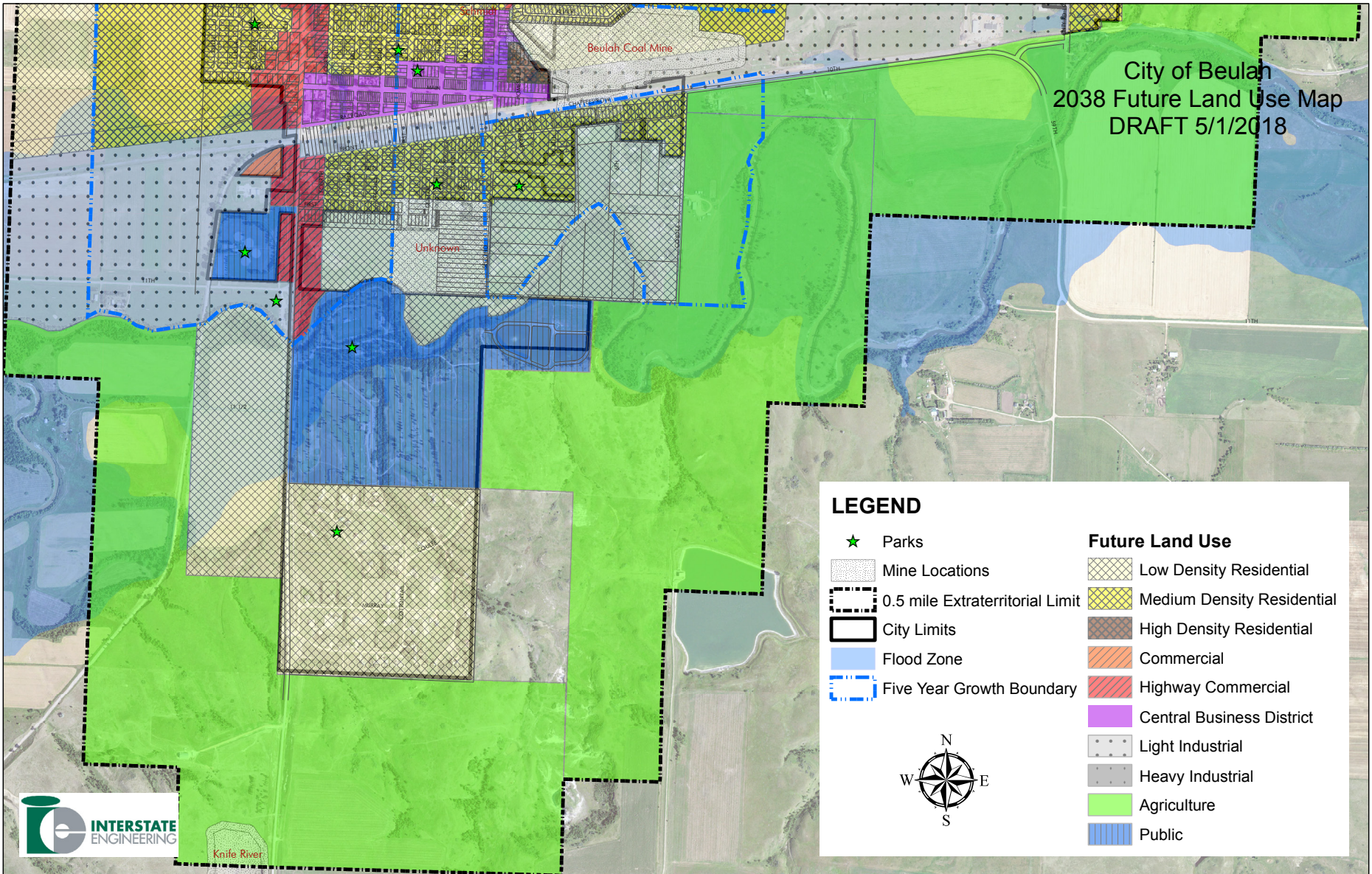


**LEGEND**

- ★ Parks
- Mine Locations
- 0.5 mile Extraterritorial Limit
- City Limits
- Flood Zone
- Five Year Growth Boundary
- N  
W E  
S
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Commercial
- Highway Commercial
- Central Business District
- Light Industrial
- Heavy Industrial
- Agriculture
- Public



City of Beulah  
2038 Future Land Use Map  
DRAFT 5/1/2018



**LEGEND**

★ Parks	<b>Future Land Use</b>
▨ Mine Locations	▨ Low Density Residential
⋯ 0.5 mile Extraterritorial Limit	▨ Medium Density Residential
▭ City Limits	▨ High Density Residential
▭ Flood Zone	▨ Commercial
▭ Five Year Growth Boundary	▨ Highway Commercial
	▨ Central Business District
	▨ Light Industrial
	▨ Heavy Industrial
	▨ Agriculture
	▨ Public



## Residential

<i>Zoning</i>	<i>Zoning Description</i>	<i>Future Land Use</i>	<i>Future Land Use Description</i>
R-1 Single Family, Detached	The R-1 Single Family, Detached district is intended to provide a low-density suburban environment with single family detached dwellings. Residences will be compatible with, and served by, parks, civic uses, institutional uses, public services.	Low Density Residential	The Low-Density Residential designation provides for residential developments establishing single family dwellings in densities between 1 and 3.8 units per acre.
R-2 Low Density Multi-Family	The R-2, Low Density Multi Family district is intended to allow for a mix of twin homes, duplexes, and single family detached dwellings in a suburban setting, including larger setbacks and easy vehicle access. Residences will be compatible with, and served by, parks, civic uses, institutional uses, public services, and utilities.	Medium-Density Residential	The Medium-Density Residential designation provides for residential developments establishing single family dwellings, duplexes, twin homes, manufactured homes in densities between 3.9 and 10.4 units per acre.
R-3 High Density Multi-Family	The R-3, High Density Multi Family district is intended to provide higher density residential development in a suburban setting, including larger setbacks and easy vehicle access. Appropriate development can include apartment buildings, attached dwellings, modular homes, and small single family detached homes. Residences will be compatible with, and served by, parks, civic uses, institutional uses, public services, and utilities.	High-Density Residential	The High-Density Residential designation provides for residential developments establishing single family dwellings, duplexes, twin homes, manufactured homes in densities up to 16 units per acre.
R-4 Manufactured Home	The R-4, Manufactured Home district is intended to allow for manufactured homes arranged together in a subdivision or park. However, single family detached dwellings are permitted. This development type is intended to be located in a suburban setting with parks, civic uses, institutional uses, public services, and utilities to serve residents. A manufactured home park offers spaces for the placement of manufactured home units on a lease or rental basis. Manufactured home subdivisions include individually platted lots, for sale within the subdivision, for the placement of manufactured home units.	Medium-Density Residential	The Medium-Density Residential designation provides for residential developments establishing single family dwellings, duplexes, twin homes, manufactured homes in densities between 3.9 and 10.4 units per acre.



<i>Zoning</i>	<i>Zoning Description</i>	<i>Future Land Use</i>	<i>Future Land Use Description</i>
R-5 Reserved for Future Use		N/A	
R-6 Rural Residential	The R-6, Rural Residential, district is the lowest density residential district. It provides for a semirural environment of low-density, single family detached dwellings along with parks, civic uses, institutional uses, public services, and utilities to serve residents. The intent of the district is to allow for individual sewage treatment systems on large lots with room for sewage treatment.	Low Density Residential	The Low-Density Residential designation provides for residential developments establishing single family dwellings in densities between 1 and 3.8 units per acre.
R-7 Urban Multi-Family	The R-7, Urban Multi Family Residential, district is intended to accommodate higher density residential development in a compact urban setting with a focus on pedestrian access to the street. The district should be situated adjacent to downtown commercial areas to maximize pedestrian access. Appropriate development will include apartment buildings and attached dwellings with parks, civic uses, institutional uses, public services, and utilities to serve residents.	Central Business District	The Central Business District designation is intended to incorporate the variety of uses that accompany downtown-oriented development and encourage both day and night-time populations. Traditional mixed use centers around first floor retail coupled with second floor and above living quarters.

## Commercial

<i>Zoning</i>	<i>Zoning Description</i>	<i>Future Land Use</i>	<i>Future Land Use Description</i>
Central Business	The C-1, Central Business, district is intended to preserve and enhance the City's main street and adjacent commercial area. The district allows for a variety of retail stores and related activities, as well as offices and service establishments which occupy the prime frontages in the central business district. The district is also designed to provide for the needs of the daytime work force and residents who may live above or behind commercial frontage. Development is intended to be pedestrian-oriented with a strong emphasis on a safe and attractive street.	Central Business District	The Central Business District designation is intended to incorporate the variety of uses that accompany downtown-oriented development and encourage both day and night-time populations. Traditional mixed use centers around first floor retail coupled with second floor and above living quarters.

<i>Zoning</i>	<i>Zoning Description</i>	<i>Future Land Use</i>	<i>Future Land Use Description</i>
Highway Commercial	The C-2, Highway Commercial, district is intended to provide for a variety of office, retail, and service opportunities for the purpose of creating a high quality mixture of attractive land uses along main highways, such as ND Highway 49, ND Highway 200, and County Road 21.	Highway Commercial	The Highway Commercial designation is for those locations immediately adjacent to ND Highway 49/200 and County Road 21.
General Commercial	The C-3, General Commercial, district is intended to provide for a full range of commercial uses, including retail, service, and office. This district excludes warehousing and similar uses that may involve heavy truck traffic.	Commercial	The Commercial designation provides for a variety of commercial uses that support the population in the surrounding area.
Neighborhood Commercial	The C-4, Neighborhood Commercial, district is intended to allow those uses necessary to satisfy the basic convenience shopping or service needs of residents in adjacent neighborhoods.	Commercial	The Commercial designation provides for a variety of commercial uses that support the population in the surrounding area.

## Industrial

<i>Zoning</i>	<i>Zoning Description</i>	<i>Future Land Use</i>	<i>Future Land Use Description</i>
Light Industrial	The I, Light Industrial, district is intended to accommodate manufacturing, processing, packaging, assembly, or treatment of finished or semi-finished products from previously prepared material. Common uses include outdoor storage, warehouses, wholesales, manufacturing, and industrial services.	Light Industrial	The Light Industrial designation is intended to accommodate lower intensity industrial uses that do not involve hazardous materials.
Heavy Industrial	The HI, Heavy Industrial, District is intended to locate manufacturing and industrial operations as to not impact lower intensity, incompatible uses. District areas should be isolated to protect uses that may be objectionable or hazardous.	Heavy Industrial	The Heavy Industrial designation provides for the broadest industrial uses including hazardous material storage and processing.

## Other

<i>Zoning</i>	<i>Zoning Description</i>	<i>Future Land Use</i>	<i>Future Land Use Description</i>
Agriculture	The A, Agricultural, district is intended to provide a location for principally undeveloped or vacant land situated on the fringe of an urban area and used for agricultural purposes however, the land may be developed in the future. The types of uses allowed in this district encourage and protect agricultural uses until development is warranted.	Agriculture	The Agricultural designation is solely for supporting and preserving agriculturally related activities.
Public & Open Space Conservation	The POC, Public and Open Space Conservation, district is intended to provide for public facilities and permanent open spaces. Public facilities include uses that are governmental, civic, public service or quasi-public in nature. Open space uses include those areas of the community which exhibit significant scenic qualities, wildlife potential, or recreational potential. Also included are high risk resource areas, such as floodplain or steep terrain.	Public	The Public designation denotes locations of government offices, parks, and open spaces.



# INFRASTRUCTURE ASSESSMENT

Major infrastructure systems are evaluated in the following chapter, providing insight into the present condition, capacity limitations, and other areas of concern. Where appropriate, recommendations for improvements are provided that will assist the City in prioritizing system maintenance well into the future.

## Water System

### System Summary

Presently, the geographical topography lying within Beulah's City limits, in relationship to its location with the City's three existing water reservoirs, creates six different water pressure zones throughout town. There is an approximate 200 foot drop in elevation from the northerly end to the southerly end of the City limits. Water is acquired through the natural underground glacial aquifers which feed the Knife River located at the south end of the City, where the community's wellhead protection area can also be found. Six raw water wells are connected to four pump houses which in conjunction are used as the intake system for the Water Treatment Plant (WTP) located on the south end of town. In 2017, the WTP was updated from its original lime-softening operation to a reverse osmosis filtration system. The plant currently produces approximately 1.44 Million Gallons per Day (MGD) to serve its businesses, local industries,

and nearly 3,200 residents. The three existing water reservoirs yield a net storage capacity of 975,000 gallons, and the two northern reservoirs were refurbished in 2016 and 2017, respectively. Existing pipe within the network generally consists of Cast Iron Pipe (CIP) and Polymerizing Vinyl Chloride (PVC) pipe, with the bulk of the CIP being located south of 7th Street and east of North Dakota Highway 49 where older infrastructure lies.

### Capacity Constraints

Further information regarding the City's current system capacity will be made available once more discussion takes place during the Comprehensive Plan process.

### Areas of Concern

#### Replacements & Maintenance

Records indicate that the majority of past water main breaks are likely due to one of two reasons: age and initial improper/poor installation. The existing CIP within older areas of the network has generally held up rather well, with the exception of a few areas where it is assumed that unsatisfactory compaction was achieved when bedding the pipe during original installation. Given the local soil types in different portions of the City, it is also possible that long term consolidation has occurred and

this settlement has caused added stresses to the already aging pipe. Additionally, although scarce in occurrences, it has been recorded that failures within the network have occurred due to electrochemical corrosion with the adjacent soils which typically implies the infrastructure was not installed with cathodic protection systems. Generally speaking, the existing water system is providing its intended design purpose and appears to be withstanding the elements of age rather well.

However, planning for infrastructure sustainability should be considered in areas where existing pipe remains in a working condition but is reaching its anticipated life span. Specific areas of town have encountered an influx of main breaks over the course of the past 10 years and should be approached as a starting point for such considerations. A map of these identified locations is provided in Appendix A for the purpose of this assessment. This data can be used to plan for the necessary form of maintenance that is required for each area. Options for such maintenance would include spot repair (low frequency/low risk break history), concentrated network area pipe lining (areas with a consistent or increasing history of main breaks), or in worst case scenarios, line replacement. Line replacement is not likely to be considered the most feasible

option considering the availability of newer, cost-effective trenchless technologies present in the industry, such as Cured-In-Place Pipe (CIPP) renovation for example. More information regarding CIPP rehabilitation is provided in Appendix B. Based on documented and historical findings, the pipe network is likely suitable for continued use with minimal areas of deficiencies, and extending the life of the network is highly recommended with the use of pipe lining methods. Such methods are an acceptable form of infrastructure enhancement when considered for various funding opportunities, and it is recommended that the City plan for these operations over the course of the next 10 to 15 years as identified in this assessment. Doing so, the City will inherit several benefits for the betterment of the community including, but not limited to, the following:

- A more efficient water distribution system, reducing minor losses and in turn increasing the usage of treated water. Efficiency at this stage of the infrastructure will help drive operational costs down.
- A sustainable approach to existing infrastructure which is a key element to the Main Street Initiative currently being deployed at the State level.
- Lower construction costs creating lower tax implications to the City's residents. Dependent on project size, past projects which would be comparable to a community the size of Beulah have yielded as much as a 25% savings in construction cost when considering CIPP rehabilitation methods.
- Rehabilitative maintenance measures can extend the life of existing infrastructure up to an additional 50+ years, minimizing the magnitude of maintenance costs for many years to come.

### Other

The water tower located in the center of the City was refurbished in 1991. This tower is located in the portion of town where pipe network infrastructure is the oldest and primarily consists of CIP. In general, all infrastructure located south of 7th Street and east of North Dakota Highway 49 fits within this category and should be considered at the top of the list when considering the implementation of sustainability, particularly gate valves in this area are in need of replacement. Additionally, according to reports produced by Interstate Engineering in the mid-2000's, it was found that on average approximately 37 million gallons of water went unbilled annually during this stretch of time; either due to minor losses within the network or un-metered water usage.

### Water Atlas

An updated Water atlas is being developed with the use of CADD software. Further improvements, alterations, or abandonments will be recorded with the use of this atlas. This will allow for a dynamic record-keeping process moving forward with the City of Beulah.

# Sanitary Sewer System (SAS)

## System Summary

Throughout time, the City of Beulah has developed its sanitary sewer network as the demands became present due to expansion. Currently, of the approximately 140,000 lineal feet (26.5 miles) of existing sewer main infrastructure in the City, it is estimated that approximately 66,000 lineal feet (12.5 miles) is 60 years in age or more, most of which consists of Vitrified Clay Pipe (VCP). Much like the Water System, newer pipe installed has primarily been done so with the use of PVC pipe. Generally speaking, sewer mains found south of 7th Street are the oldest and typically found to be VCP. The northern half of town is newer development when compared to the rest of town, and the pipe is generally PVC. Two lagoon systems are used to treat the raw effluent prior to discharge, one being located to the northeast with a capacity of approximately 91 million gallons and the other located to the south near the Knife River has a capacity of approximately 19 million gallons. Nine lift stations are used throughout the City to provide adequate hydraulic demands necessary to transport raw waste to each lagoon.

## Capacity Constraints

The SAS network which currently exists through town is considered efficient in size to serve the City's current demands as well as any reasonable anticipated growth. The City of Beulah has indicated their interest in its infrastructure being capable of handling the capacity of 6,000 residents. Generally speaking, with the current structure of the SAS network, residential infill generating the flow demands of such a population would be handled by this existing infrastructure but would need to be properly analyzed to determine if any minor infrastructure changes would need to be made. Such infrastructure is not only limited to existing pipes and their respective sizes, but the current build of lift stations and lagoons as well. However, any large scale single user, such as a new area light/heavy industrial employer for example, would need to be assessed individually and is dependent on the location and specific needs. As a baseline for this specific example, the City lagoon system has an additional capacity availability of approximately 3,000 residents, or approximately 54 million gallons, when considering the design standard 180 day residence time typically utilized in the treatment process. Therefore, any new light/heavy industrial employer would need to fall within these capacities without the need for

further infrastructure development. In addition to the aforementioned highlights, performance efficiency of the existing network should be questioned due to the age of the infrastructure as well as the material in which it is made of. The likelihood of leakage due to the age of the pipe is of concern, and hydraulic efficiency is expected to likely be less than the network's originally intended design capacity. In terms of anticipated growth and strategic planning, certain areas of the City will be identified for future use with respect to the existing infrastructure, its current layout, and additional capacities which certain areas can reasonably handle. With consideration in reference to existing infrastructure, certain areas are more cost effective than others and should be considered when finalizing a strategic growth plan.

## Areas of Concern

### Replacements & Maintenance

As previously mentioned in the summarization of SAS infrastructure, nearly 48% of this existing network system consists of pipe which is nearing its anticipated life span in respect to its intended design. With this existing infrastructure in mind, it is in the best interest of the City of Beulah to map the areas of concern within the existing network via televising to better gauge



the condition of the pipe that is currently in place. Additional considerations can be made upon the completion of this task, such as sewer lining of existing infrastructure, implementing a smart and sustainable approach to extending the life of what is already in place. As previously mentioned in the Water section, CIPP is one of several trenchless rehabilitation methods that can be considered for this purpose and it is a cost-effective approach to achieving a desirable and sustainable outcome, adding approximately 50 years of extended life to infrastructure which already exists and greatly reduces the impact of cost to the City and its residents. If pipe is deemed unusable, further options can be explored for replacement dependent upon the specific scenario and its position within the existing network, as well as the pavement condition(s) above the pipe. Lastly, recent records indicate that existing manholes associated with this network are experiencing an influx in infiltration which can be a burden to existing lift stations and lagoon systems alike. Proper sealing measures of these structures should be implemented to reduce the adverse impact this process provides to the existing system.

### **Other**

Some areas in town should be analyzed for hydraulic concerns. A topographic quad map will be developed identifying various areas in and around the City that may require enhancements to the existing and/or future system hydraulic & energy grade lines (i.e., lift stations, boosters, hydraulic jumps, flow control measures, etc.) Lastly, discussions regarding an analysis should be had pertaining to the infrastructure within the lift stations, realistic life expectancies, and pump efficiencies & performance.

### **Sanitary Sewer Atlas**

An updated SAS atlas is being developed with the use of CADD software. Further improvements, alterations, or abandonments will be recorded with the use of this atlas. This will allow for a dynamic record-keeping process moving forward with the City of Beulah.

# Roads

## System Summary

There are approximately 30 miles of developed roadway infrastructure within the City of Beulah. Of those 30 miles, approximately 25 miles of the network is paved with asphalt, while the rest of the town consists of gravel roads. In 2011, the City chip sealed all of the paved roads in town north of the railroad tracks, and yearly maintenance measures are performed in areas of need. The streets south of the railroad tracks were chip sealed in 2009. Crack sealing of the existing paved roads occurs in a predetermined, cyclical manner, where the City is divided into 3 equal parts with one part being sealed per year, and the process continues in a rotational manner. Maintenance costs for patching, crack sealing, and concrete (curb & gutter) repairs have averaged \$100,000 to \$140,000 annually. In some areas of the City, edge drains are in place to alleviate subgrade saturation and water table issues, as well as providing means of runoff conveyance in areas with low flow velocities.

## Life Span

The overall trend of oil prices since 2000 has raised the price of asphalt and reduced its price advantage over concrete, however asphalt is still considered the more economical choice

when considering construction costs. While asphalt costs less initially, it typically requires more maintenance costs over time and it does not last as long as concrete if properly installed and maintained. Generally speaking, concrete surfacing is not necessary in 90% of the areas within the City of Beulah, and while the remaining 10% can also be argued in the same manner, concrete may actually be considered a more ideal solution. Areas throughout the City which experience the most daily traffic, i.e. equivalent single axle load (ESAL), may provide more benefit if considering concrete construction for long term sustainability and cost-effectiveness. Such areas would include Main Street and Central Avenue, as well as the primary haul routes through town such as Front Street. It is not imperative that the City implement concrete surfaces in these areas, but a 30 year life-cycle costs analysis would provide additional data at the City's fingertips when considering changes in the future.

## Emergency Access

Beulah's current City footprint extends beyond the Burlington Northern Santa Fe (BNSF) railroad on the southerly end of town and poses issues when considering emergency access. All City streets, as well as North Dakota Highway 49, providing access to

the City's emergency facilities and transport systems are intersected by the railway, leaving the community's southernmost residents with an emergency health, fire, flood, and safety hazard. Future consideration of a bypass may be recommended to allow for these emergency services 24 hours a day in this portion of the City.

## Areas of Concern

Overland runoff in the south end of the City often experiences low flow velocities in some areas due to the topography of the area. This presents susceptibility to surface degradation due to freezing & thawing, as well as infiltration & saturation which adversely affects the life of the pavement in this area. In the northern portion of town, topography typically is not a concern and the roads convey water rather well. However, subgrade material in the area primarily consists of lean and fatty clays with a high water table, where long term consolidation is prevalent and settlement of streets can occur in areas. The weight of the garbage trucks used in the City are an added burden to the structural integrity and life span of the pavement throughout town,

## **Replacements & Maintenance**

Given that the vast majority of the City's current road infrastructure is made up of asphalt, annual maintenance will continue to be required in order to extend the life of the pavement. Prior chip sealing of the City streets as previously outlined has held up rather well and appears to still be performing at an acceptable level. Generally speaking when considering asphalt maintenance, chip sealing should be planned or considered every 10 years at a minimum, and crack sealing should continue in the cyclical manner in which it is currently being implemented. Moving forward, it is recommended that the City consider newer technologies such as a scrub seal process as the cost impact is generally the same and the end result is a better product, which will also help drive down maintenance costs.

## **Other**

For the purpose of future planning, prior to major roadway rehabilitation and/or replacement, the City should consider the condition of the existing infrastructure lying beneath the road. At a minimum, any areas where new pavement is being considered should have the existing water and sewer systems replaced or lined with CIPP, if necessary.



## Storm Sewer System (STS)

### System Summary

In the City of Beulah, storm water runoff is typically collected overland by curb & gutter and routed to one of the two existing unnamed tributaries positioned on each side of town. Some underground storm water collection systems do exist, but its footprint is not to the extent of the water and sanitary sewer networks. Areas of town where topography does not allow for proper overland drainage to occur, a storm sewer has been implemented to alleviate such events. Such infrastructure has been designed to typically handle 2-5 year events in accordance with tabulated and recorded rainfall values as documented by the National Oceanic and Atmospheric Administration (NOAA) for the Beulah, ND area. Additional edge drain systems are in place throughout the City to help convey runoff through areas of town where overland flow is a bit more challenging, and where subsurface water elevations are also an issue.

### Capacity Constraints

Designing storm water infrastructure for 2-year to 5-year events is typically the case when dealing with budget concerns, and a 5-year event design is an ideal minimum, and

should be considered when looking at options for future planning. Planning & Zoning (P&Z) becomes a key element when assessing storm sewer capacities and planning for future needs. Understanding the room for growth in different areas of the community and what limits that growth will bring to existing infrastructure should be well known prior to implementing any new water retainage and/or conveyance structures and systems. When considering the development of a water retainage structure/system, post construction flows from the development should equal the preconstruction flows to alleviate the impact on pre-existing infrastructure downstream. For this reasoning, it is recommended that the City implement a “no-increase” regulation in their ordinances to eliminate, or at a minimum mitigate, the impacts of future development on existing infrastructure.

### Areas of Concern

Overland runoff in the south end of the City often experiences low flow velocities in some areas due to the topography of the area. This presents susceptibility to surface degradation due to freezing & thawing, as well as infiltration & saturation which adversely affects the life of the pavement in this area. In the northern portion of town, topography typically is not a concern and the roads convey water rather well. However,

subgrade material in the area primarily consists of lean and fatty clays with a high water table, where long term consolidation is prevalent and settlement of streets can occur in areas. The weight of the garbage trucks used in the City are an added burden to the structural integrity and life span of the pavement throughout town,

### Replacements & Maintenance

There are areas in town where STS infrastructure does not exist, and should be implemented to address past flooding issues/impacts which have occurred from rain storm events. Additionally, there are areas within town that have existing storm sewer that will need a capacity evaluation given the flooding issues experienced during heavier rainfall events in the area.

### Other

The US Army Corps of Engineers (USACE) is currently in the design stages of providing a Section 22 study to the City of Beulah in regard to storm water and snow melt runoff in and around the community. The direct impacts of this study will be outlined and possible solutions to these issues will be provided. This will serve as a key element to future planning and will need to be considered when addressing future City growth as it relates to the location of the governed floodways surrounding Beulah.

### **Storm Sewer Atlas**

An updated STS atlas is being developed with the use of CADD software. Further improvements, alterations, or abandonments will be recorded with the use of this atlas. This will allow for a dynamic record-keeping process moving forward with the City of Beulah.

## Downtown Area

### Special Considerations

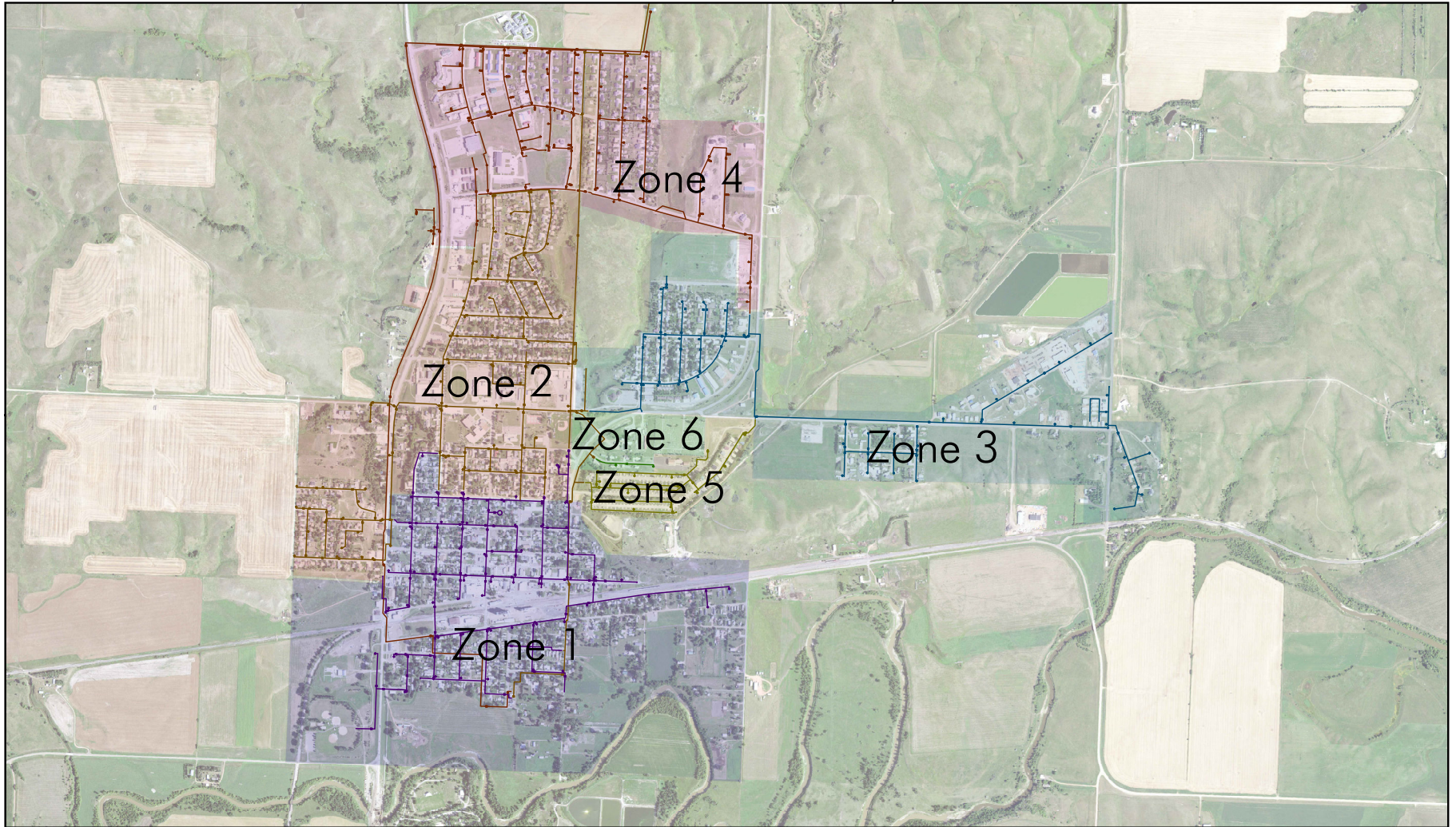
Being considered the most vital infrastructure within the community, sustainability of the Downtown Area should be the key focus for the City. It is recommended that a streetscape improvement plan be considered to identify the overall goal with the appearance and functionality of Beulah's Downtown Area. Prior to implementing this plan, infrastructure within the Main Street area will need mapped so its current condition can be assessed, and corrective rehabilitation can be planned for prior to any streetscape improvements taking place. This also allows the opportunity for a more strategically sound approach to future developments in the City and their respective impacts on this area, ensuring the most economically feasible steps are taken. Existing sanitary sewer infrastructure will be impacted the most, particularly on the west end of Main Street, where that particular trunk line is susceptible to future growth impacts. Additionally, consideration of service line repair/replacement stemming from the main trunk lines should take place within the roadway so as to minimize its impact on the roadway above it. All underground assets in this area should hold primary concern, and once addressed for

future needs, roadway enhancements would then be considered. As previously mentioned in the Roads Assessment, Main Street is an ideal location for the consideration of a concrete roadway due to its daily traffic loads but as a cost-saving approach a recycled asphalt base layer with new bituminous pavement may also be the best option.

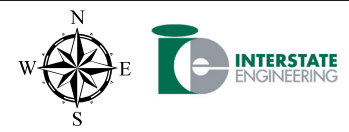
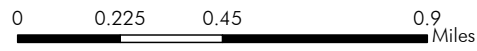
# APPENDIX



# Water Infrastructure - Beulah, ND

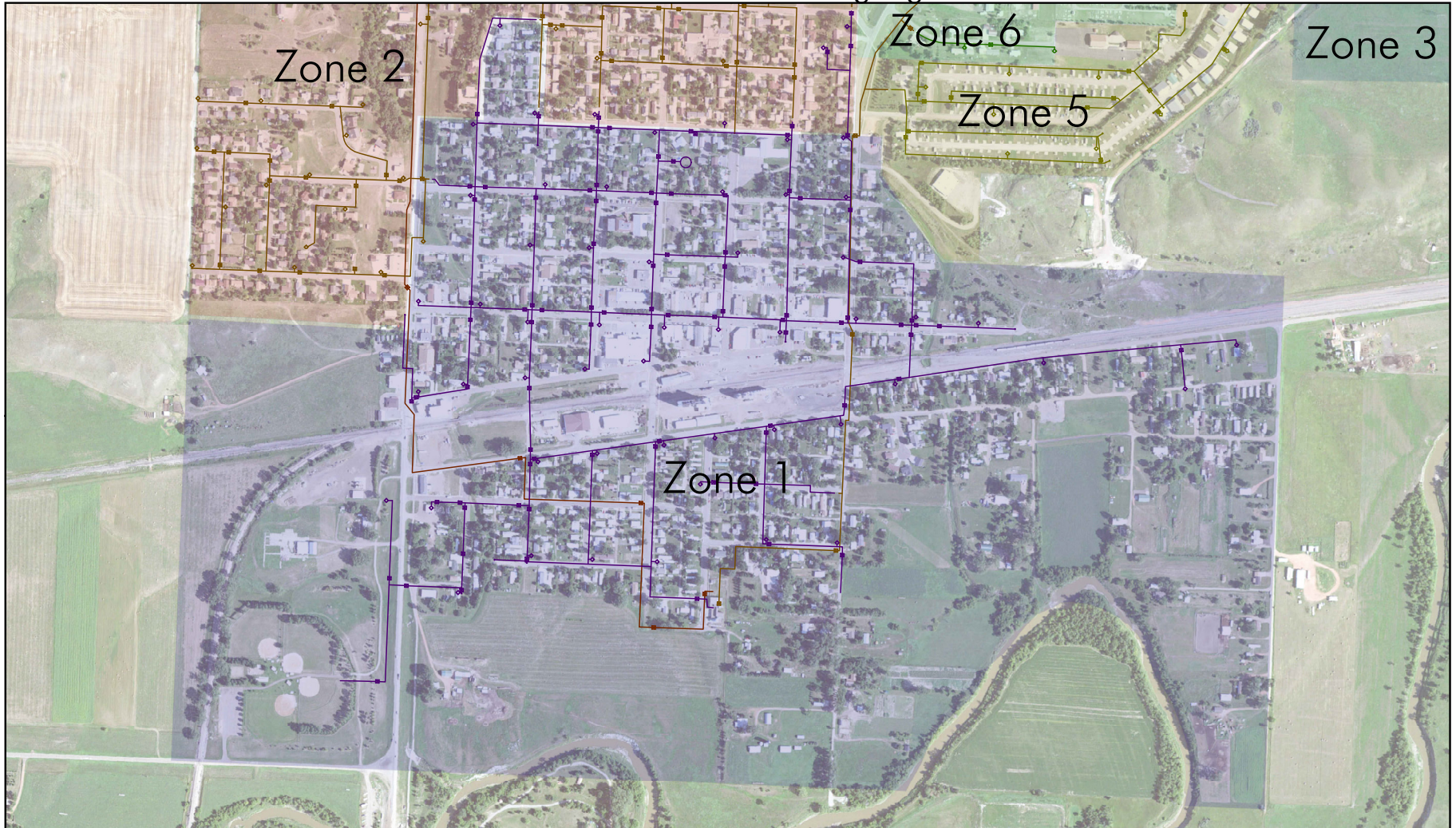


City of Beulah  
Water Infrastructure

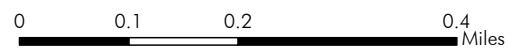




# Water Pressure Zone 1 Highlight



City of Beulah  
Water Infrastructure

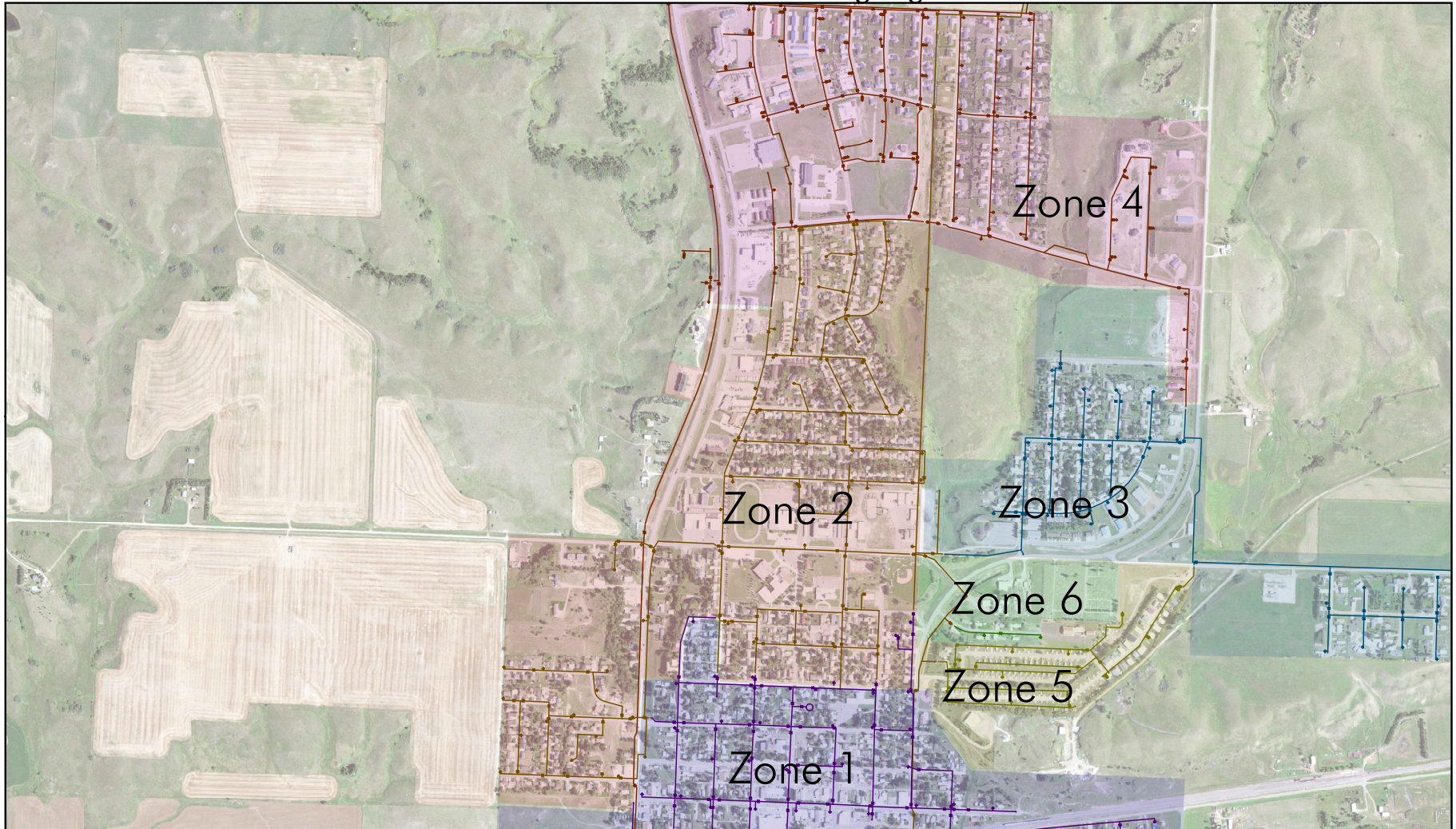


- Gate Valve
- Fire Hydrant
- Pressure Reducing Valve

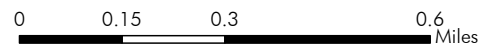




## Water Pressure Zone 2 Highlight



# City of Beulah Water Infrastructure

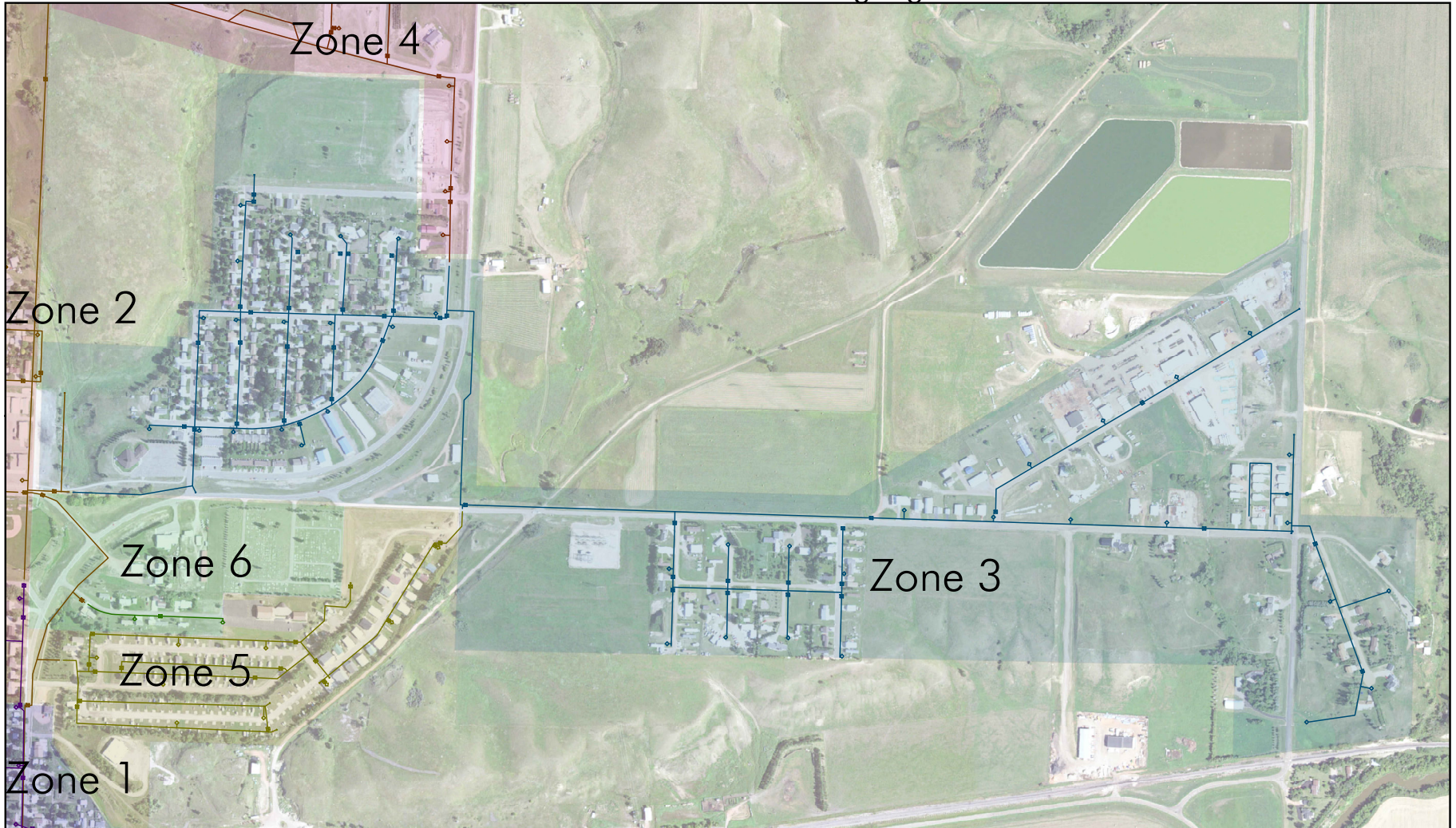


- Gate Valve
- Fire Hydrant
- Pressure Reducing Valve

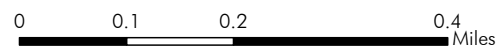




# Water Pressure Zone 3 Highlight



City of Beulah  
Water Infrastructure



- Gate Valve
- Fire Hydrant
- Pressure Reducing Valve

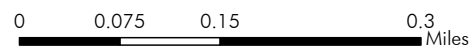




### Water Pressure Zone 4 Highlight



## City of Beulah Water Infrastructure



- Gate Valve
- Fire Hydrant
- Pressure Reducing Valve

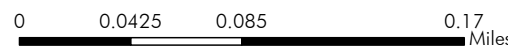




# Water Pressure Zone 5 Highlight



City of Beulah  
Water Infrastructure



- Gate Valve
- Fire Hydrant
- Pressure Reducing Valve



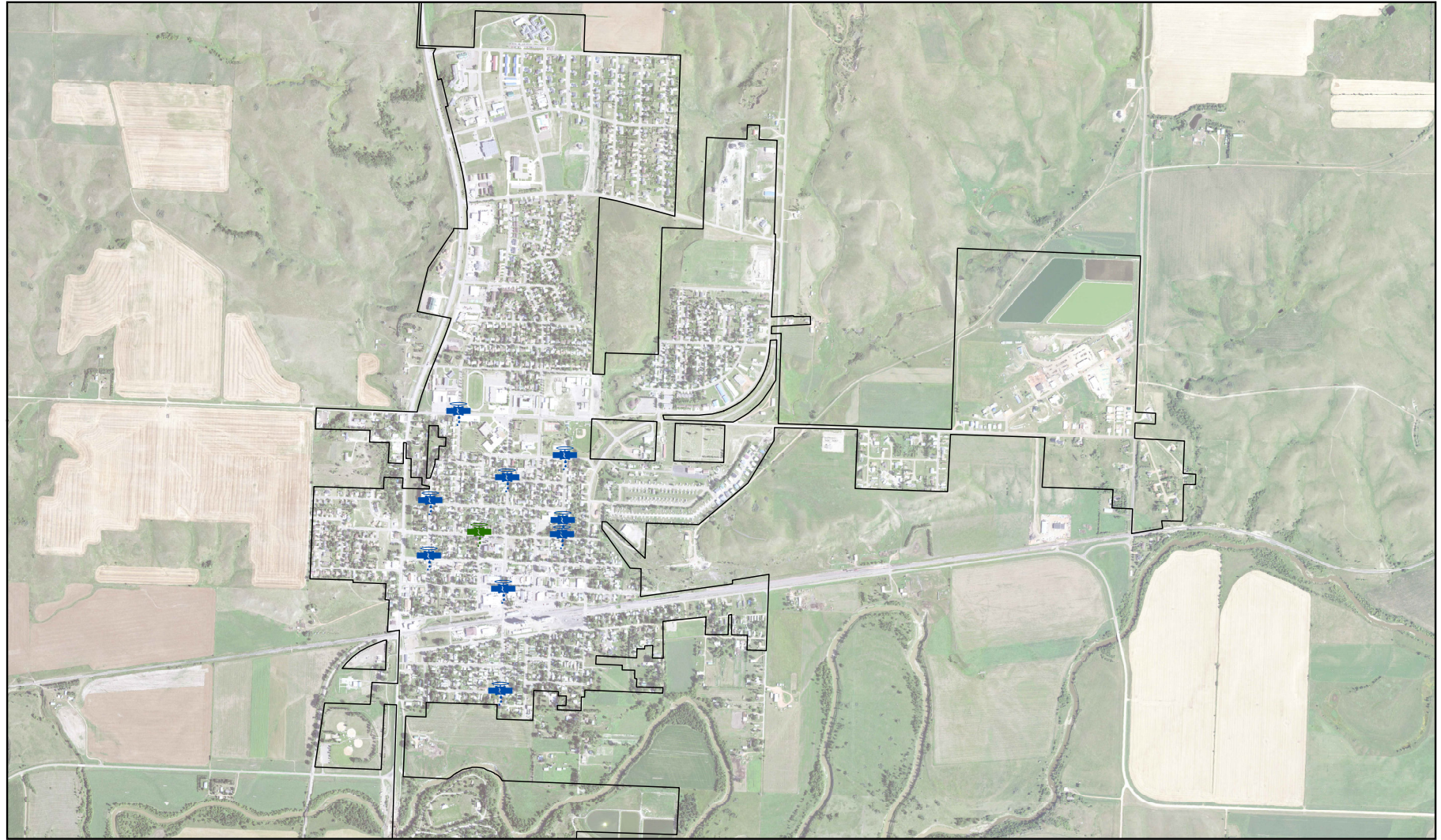


### Water Pressure Zone 6 Highlight



## City of Beulah Water Infrastructure





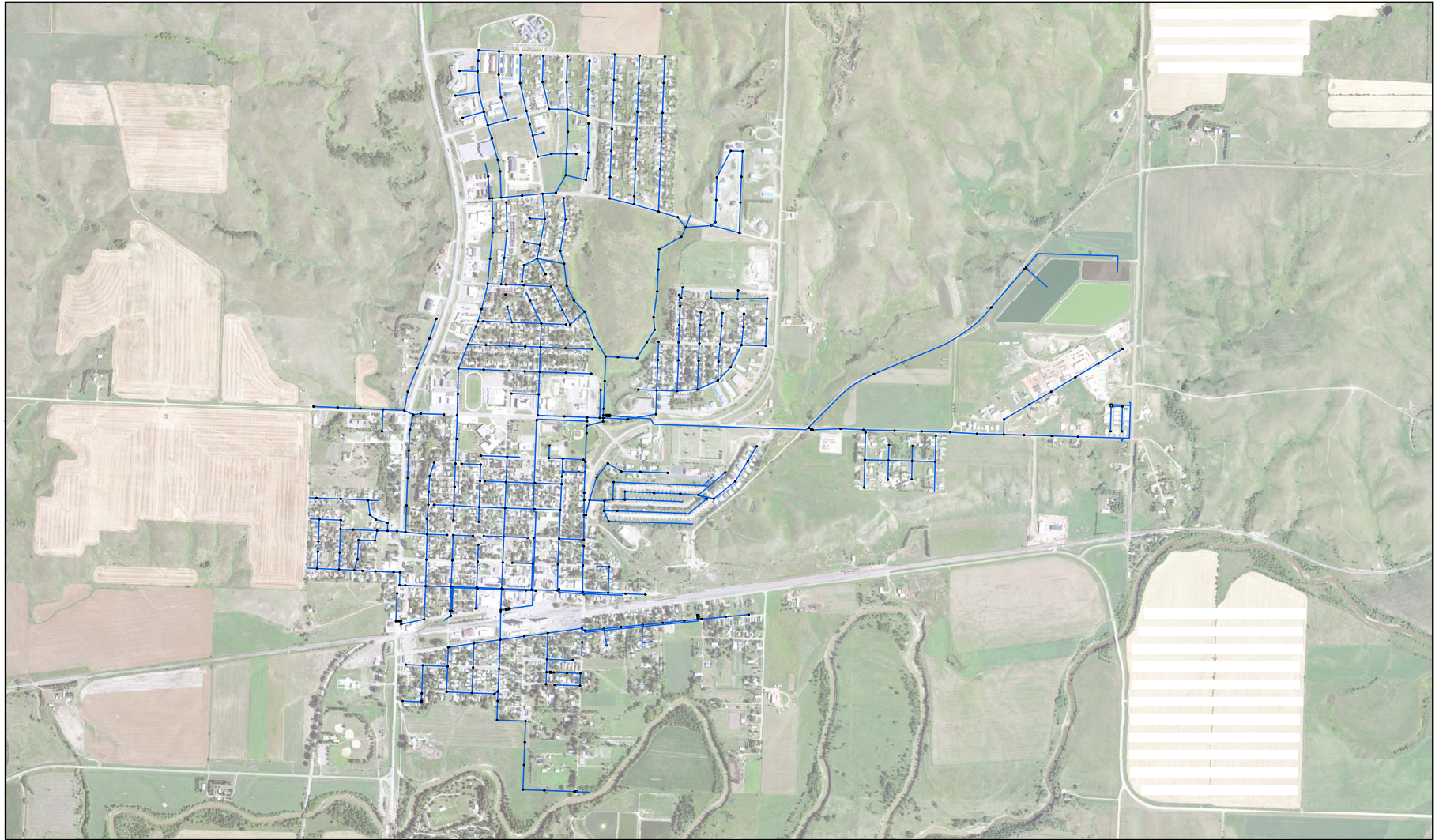
City of Beulah  
 Water/Sewer Breaks Last 10 Years

0 0.25 0.5 1 Miles

-  Sewer
-  Water







# City of Beulah Sewer Infrastructure

