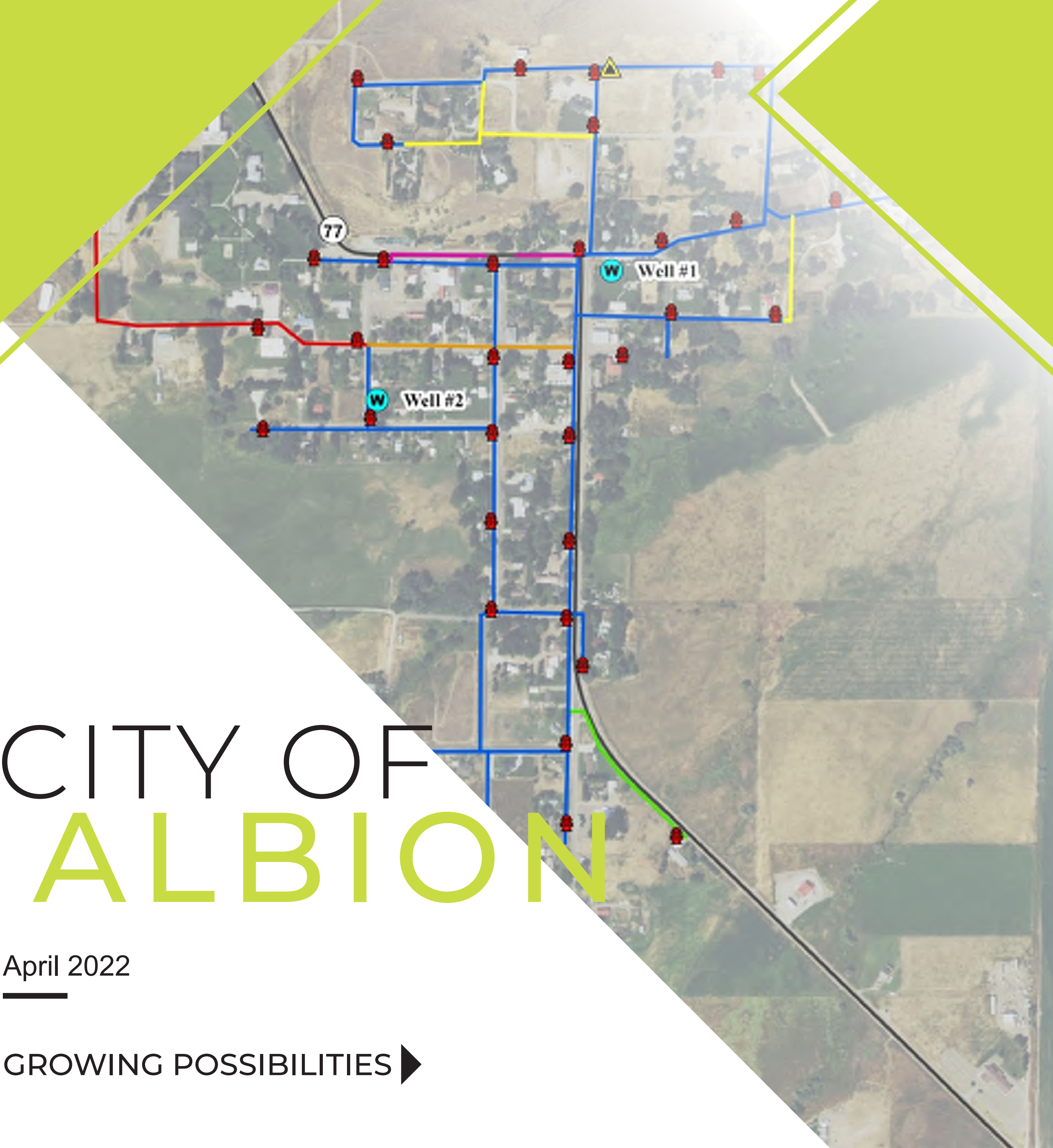
Water Facilities Planning Study

KA #220145



CITY OF ALBION

April 2022

GROWING POSSIBILITIES

CITY OF ALBION, IDAHO

WATER FACILITIES PLANNING STUDY

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LICENSED
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April 2022
KA PROJECT NO. 220145

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AUTHORIZATION

In December 2020, the City of Albion, Idaho contracted with Keller Associates, Inc. to complete a Water Facilities Planning Study (WFPS) in accordance with IDAPA 58.01.22 to evaluate the City's water supply and distribution system (potable water system (PWS) No. ID5160001) and develop a plan to meet future system demands. 75% of the costs of the study was funded by a USDA-Rural Development SEARCH grant.

EXECUTIVE SUMMARY

Introduction

The purpose of this Water Facilities Planning Study (WFPS) is to assess the condition of the community water system and its ability to provide for the long-term needs of the City, to identify areas within the water system for improvement, and to provide a comprehensive water system planning document.

This study evaluates multiple alternatives and identifies improvements to overcome source, water quality, and distribution system deficiencies and addresses any violations of State or Federal requirements. Implementation of these recommendations will help the City meet the projected water needs for the next 20 years.

System Summary

The City of Albion provides drinking water for City residents (2021 population of 318). The water is pumped from two groundwater wells directly into the distribution system. The water is disinfected with sodium hypochlorite at each well. A 242,000 gallon, partially buried concrete water storage tank is located at a higher elevation outside of town, which provides gravity pressure and storage volume to the distribution system. The distribution system consists of large diameter water mains that convey water to smaller diameter distribution lines.

Average day demands within the system are approximately 0.126 MGD and increase to 0.745 MGD during maximum demand days in the summer months. Peak hour demands are estimated to be 1.73 MGD. For planning purposes, 20 and 40-year demand projections are considered herein.

System Deficiencies and Need for Action

Deficiencies and issues throughout the distribution system reported by the Operators and observed through the course of this study are summarized below:

- The system is out of compliance on a design basis (IDAPA 58.01.08.501.03). If maximum day demands were to occur for more than one day in a row, the system would likely run out of water.

- The system is out of compliance with groundwater source redundancy (IDAPA 58.01.08.501.17). If a single well goes out of service during a period of high demand, the system could run out of water.

- The system is out of compliance with redundant fire flow capacity (IDAPA 58.01.08.501.18). The system cannot meet the required fire flows and fire flow duration even with all pumps in service, let alone with a single pump out of service.

- The City will need to purchase additional water rights once another well is drilled to avoid exceeding the maximum diversion rate of their existing water right.

- A couple of areas in the City lack fire hydrants and have inadequate fire flows due to dead-ends or undersized pipes in the distribution system.

- Numerous significant deficiencies were identified in the City's most recent Sanitary Survey, including well head deficiencies, chlorination storage and safety deficiencies, well house envelope deficiencies, and the lack of adequate water quality sampling plans.

- Numerous recommended upgrades were identified to address water quality in the storage tank, improve the Well #1 wellhouse envelope, provide emergency standby power, and improve the SCADA programming.

- The residential water meters are old and will need to be replaced within the next few years. The current method of manual meter reading is time intensive and difficult in the winter months.

Evaluation of the identified deficiencies resulted in several improvement alternatives which are intended to address current shortcomings, facilitate compliance with state and federal regulations, and assist the City in providing a reliable and sanitary water supply.

Alternatives Considered

Numerous alternatives to address the identified deficiencies were assessed. These alternatives are explored in depth in Chapter 5. Alternatives considered included both no action alternatives and capital improvements including upgrades and construction of additional infrastructure. To address the regulatory compliance deficiencies, developed alternatives included new wells, new storage, and alternative water supplies. To address the distribution deficiencies, a single alternative with recommended distribution system improvements was identified. Additionally, three separate alternatives were developed to address the sanitary survey deficiencies, the recommended upgrades, and residential meter replacements.

Preferred Alternatives

The City developed their preferred alternative for each deficiency. The City's preferred alternative for the design basis, source redundancy, and redundant fire flow capacity is *Alternative 1B – Increase Well #1, Two New Wells, & New 250,000 Gallon Tank*. This alternative can be implemented in two phases, as explained in Chapter 7.

The preferred alternative for the distribution system improvements is *Alternative 2A – Distribution System Improvements*. This alternative includes installing two additional fire hydrants, and installing up to four new water lines to increase fire flows.

The City will need to address the sanitary survey deficiencies identified in *Alternative 3 – Sanitary Survey Improvements*. The City's choice of whether or not to implement *Alternative 4 – Recommended Improvements* and *Alternative 5 – Meter Replacement & Automated Meter Reading* will likely depend on available grants and funding terms.

The anticipated costs of the above alternatives are shown in Table 1 below.

Table 1 Capital Improvement Plan

ID#	Item	Cost*
Priority 1 Improvements		
1B	Increase Well #1, Two New Wells, & New 250,000 Gallon Tank	$3,253,000
2A	Distribution System Improvements	$524,000
3	Sanitary Survey Improvements	$151,000
4	Recommended Improvements	$215,000
-	Water Rights Purchase*	$1,500,000
	Total Priority 1 Improvements	***$5,643,000***
Priority 2 Improvements		
5	Meter Replacement & AMR	$111,000
	Total Priority 2 Improvements	***$111,000***
	TOTAL WATER SYSTEM PRIORITY IMPROVEMENTS	***$5,754,000***

*Estimate. Actual cost will vary based on local/regional water rights market conditions.

Financial Analysis

A lifecycle cost and non-monetary costs comparison of the alternatives was presented in Chapter 6. The impact to user rates of the recommended alternatives is shown in Table 2. The second to last column in the table shows the total increase necessary to implement all of the alternatives as well as to purchase the water right. The final column shows the new rate the City would need to charge if all of the alternatives were implemented, which includes the existing $33/month base rate. The proposed improvements are not anticipated to have a significant negative impact on the operation and maintenance costs of the water system. Funding package scenarios are typical of recent years though with the current ARPA funding being allocated, actual funding scenarios may be much more favorable to the City.

Table 2 Increase in Monthly User Rate

Funding Scenario	Alt 1B	Alt 2A	Alt 3	Alt 4	Water Rights	Alt 5	Total Increase*	New Rate*
USDA-RD 30% Grant 40-yr @ 2.00%	$46.39	$8.34	$3.71	$5.38	--	$2.45	$100.59	$133.59
DEQ 2% Grant 30-yr @ 1.75%	$72.71	$12.58	$4.93	$7.11	--	$3.35	$135.10	$168.10
Idaho Bond Bank 30-yr @ 2.00%	--	--	--	--	$34.32	--	--	--

*Includes the increase of all alternatives, plus the increase due to the purchase of the additional water right.

Implementation Schedule

Developing a schedule to implement system improvements provides a timeline that will help motivate project development, the identification of funding sources, education of the general public, and establish deadlines for major project milestones. A preliminary project schedule is presented in Table 3.

Table 3 Preliminary Project Schedule

Event	Date
Bond Election or Judicial Confirmation	Nov 2022
Obtain Funding	Jan 2023
Complete Environmental Information Document	Mar 2023
Begin Design of Improvements	Mar 2023
Funding Agency Review	Nov 2023
Bid	Jan 2024
Begin Construction	Mar 2024
Complete Construction	Dec 2024

CHAPTER 1 INTRODUCTION

1.1 PROJECT PURPOSE AND NEED

In 2020, the City of Albion, Idaho contracted with Keller Associates to prepare a Water Facilities Planning Study. The purpose of the study is to provide a comprehensive evaluation of the existing community public water system (PWS# ID5160001), and to identify deficiencies that need to be addressed to meet current and future demands. Keller Associates has worked with key City staff to understand the challenges facing the system and develop practical, cost-effective solutions. Keller Associates gratefully recognizes the City's administrative and support staff, and all others involved for their support and assistance in the completion of this study.

1.2 SCOPE

The scope of this study includes the following:

- Identify and describe environmental conditions within the planning area
- Identify and evaluate standards, recommendations, and design criteria for:
    - Water supply
    - Storage
    - Pressure requirements
    - Fire protection
- Existing Facilities Condition and Evaluation
    - Compilation of data concerning the age and condition of the existing water system, including but not limited to the water wells, well pumps, pump houses, storage tank, and distribution system
    - Evaluation of the existing water system components
        - System pressures
        - Facility and pipe capacities
        - Available fire protection
        - Water supply
        - Water storage
        - Transmission and delivery
    - Outline of prioritized recommended improvements
- Model Existing Water Facilities
    - Compile and review in the computer model:
        - Inventory of existing facilities
        - Type and amount of water consumption and production
- Existing and projected land use and population
    - Develop alternative solutions to address potential system deficiencies
- Master Planning and Capital Improvement Plan
    - Develop population projections (20-yr and 40-yr)
    - Review current and future water demand, supply, and storage needs
    - Prepare Master Plan including:
        - Future facility needs
        - Replacement and repair of existing facilities
    - Develop an estimated schedule for capital improvements and a summary of potential impacts on rates
    - Discuss funding sources and options
- Report Preparation

- Submit to the City of Albion for their review and approval
- Submit to Idaho Department of Environmental Quality for review and approval

- Public Participation, Presentations, and Meetings

1.3 REPORT ORGANIZATION

This report is intended to provide a methodical description of the complete water system for the City of Albion, including a synopsis of source water, storage, transmission, delivery, and treatment. This report is organized to address these items regarding current and future conditions. A table of contents is provided as a comprehensive layout of the report, following which a list of tables and figures is included for reference. A summary of the chapters included in the report follows.

Chapter 1 – Introduction
Chapter 2 – Project Planning
Chapter 3 – Existing Facilities Condition & Evaluation
Chapter 4 – Need for Project
Chapter 5 – Alternatives Considered
Chapter 6 – Alternative Analysis
Chapter 7 – Preferred Alternatives
Chapter 8 – Conclusion

1.4 ABBREVIATIONS

- ADD Average Day Demand
- AWWA American Water Works Association
- bgs below ground surface
- cfs cubic feet per second
- DEQ Idaho Department of Environmental Quality
- EPA United States Environmental Protection Agency
- FF fire flow demand
- ft. foot
- fps feet per second
- gal gallons
- gpcd gallons per capita per day
- gpd gallons per day
- gpm gallons per minute
- Hp horsepower
- IDWR Idaho Department of Water Resources
- kW kilowatt
- MCL maximum contaminant level
- MDD Maximum Day Demand
- mg/L milligrams per liter
- MG million gallons
- MGD million gallons per day
- PHD Peak Hour Demand
- ppb parts per billion
- ppm parts per million
- psi pounds per square inch

- SDWA Safe Drinking Water Act
- WFPS Water Facilities Planning Study

1.5 DEFINITION OF TERMS

- Average Day Demand (ADD) – the volume of water supplied to the system in a year divided by 365 days.
- Consumption – refers to the volume of water customer's use. Consumption is generally measured with a water meter installed at each consumer's connection to the water system. In cases where a water system is not equipped with water meters at individual connections, consumers are charged a flat rate for water usage.
- Demand – refers to the water needed to meet residential, commercial, industrial, and public water needs over a period of time, as well as the system losses that are associated with the demand. Demands on the water system vary by the time of day and season. Due to varying consumer needs, system condition, and other factors, individual communities have unique water demand patterns. Volumetric rates (gpm or cfs), volumes (gal or MG), and per capita demand (gpcd) are often used to quantify the demand placed on a system.
- Demand Factors – also referred to as peaking factors. Demand factors define the relationships between ADD, MDD, and PHD.
- Fire Flow Demand (FF) – flow required to supply a sufficient quantity of water to fight a fire. The *International Fire Code* establishes fire flow requirements and is the accepted code in the State of Idaho.
- Firm Pumping Capacity – the total pumping capacity of the water system with the largest pump out of service
- Maximum Contaminant Level (MCL) – refers to the greatest concentration of a contaminant allowed in drinking water often reported in ppm, ppb, mg/L, or µg/L.
- Maximum Day Demand (MDD) – the maximum volumetric rate or volume of water supplied to the system in one day during a year.
- Peak Hour Demand (PHD) – the maximum volumetric rate or volume of water supplied to the system in one hour during a year.
- Safe Drinking Water Act (SDWA) – United States regulation passed by Congress in 1974 to protect public health by regulating public drinking water. The Act was amended in 1986 and 1996 and is enforced by the EPA.
- Total Pumping Capacity – the total pumping capacity of all pumps within a pumping system.

CHAPTER 2 PROJECT PLANNING

This portion of the report presents a general overview of existing conditions within the study area. An Environmental Information Document (EID) will be prepared in conjunction with this study if required for any improvements pursued by the City of Albion. An EID, if prepared, will provide additional detail regarding environmental conditions within the planning area, potential environmental impacts which may result from the implementation of the proposed improvements, and means to mitigate these environmental impacts.

2.1 PROPOSED PROJECT PLANNING AREA IDENTIFICATION

The City of Albion is in Cassia County and is part of the Burley Micropolitan Statistical Area. State Highway 77 directly intersects the city of Albion through the North-West and South-East corner. Based on the Township records provided by the Bureau of Land Management (BLM), the city of Albion is located in Township 12 South, Range 25 East, in Section 6. Figure 2-1 shows the location of Albion with regard to the State of Idaho.

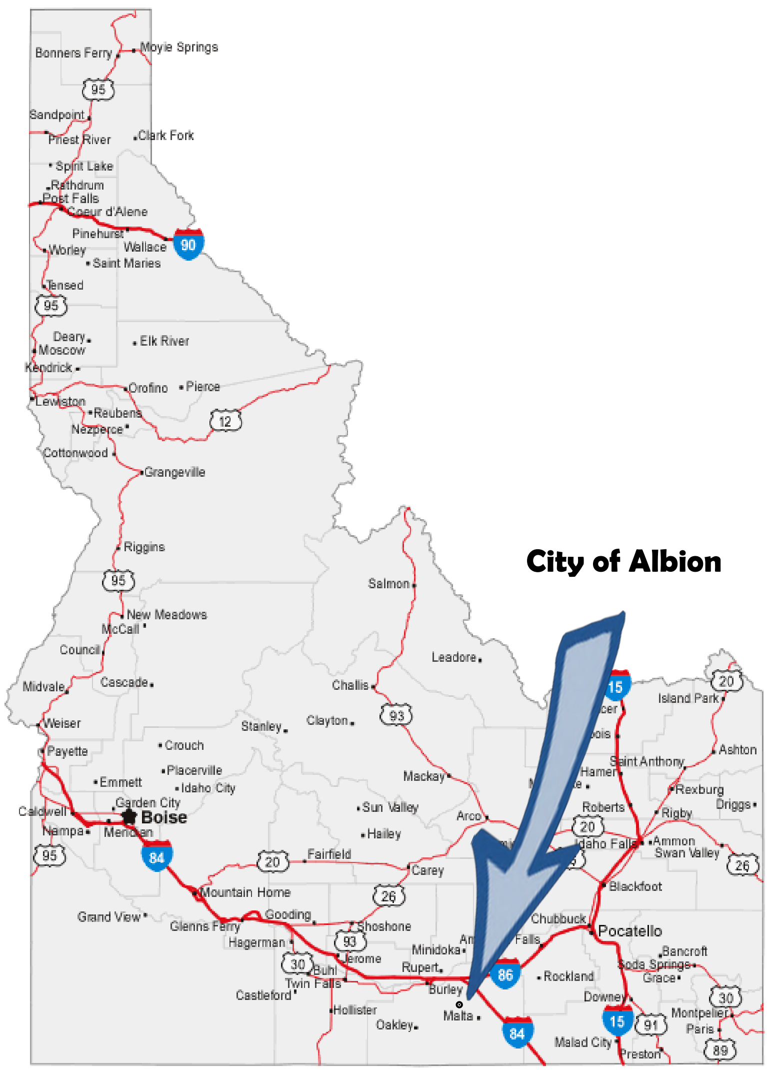


Figure 2-1 Vicinity Map

This Water Facilities Planning Study is based on a specific proposed project planning area which incorporates the region and population which the water system could reasonably be expected to serve for the 40-yr planning period from 2021 to 2061. Figure 2-3 at the end of this chapter identifies this planning area.

2.2 ENVIRONMENTAL RESOURCES PRESENT

2.2.1 Physiography, Topography, Geology, and Soils

The City of Albion is located in south-central Idaho and is surrounded by the Albion Mountain range on the southwest, the Cottrell Mountains on the northeast and the East Hills on the north side. The City is elevated 4,724 ft. above sea level.

An area of potential effect has been established which is approximately 412 acres in size. This area includes the city boundaries, potential area of growth, the road leading to the water tank located on E 800 S, with a 100-foot buffer around the entire city boundary. The soils found within the planning area consist primarily of silt loam. A soils map is available in Figure 2-4 and Appendix A contains additional mapping and soil descriptions obtained from the Natural Resources Conservation Service (NRCS) Web Soil Survey (U.S. Department of Agriculture, 2021).

2.2.2 Surface & Ground Water Hydrology

Albion is within the Snake River Basin watershed approximately nine miles south of the Snake River. Marsh Creek is the primary surface water source in the planning area, which is fed from snow melt and precipitation on the north slope of Mt. Harrison in the Albion Mountains. The creek flows northwest through the City, then along the eastern edge of the East Hills, and finally heads west into Declo before draining into the Snake River. The creek has fluctuating flows during the spring season and consists of low base flows the rest of the year. The City has a surface water right from the creek totaling 0.91 cfs with a priority date of 1873.

According to the Idaho Department of Water Resources (IDWR) Wells and Groundwater Management Map there are six wells located within the proposed planning area, although there are many additional wells immediately outside of the planning area (Idaho Department of Water Resources, 2021). However, the IDWR map does not show the City's water supply wells, so it is possible there are additional wells not shown on this map. Static water depth in the six wells ranges from 19 ft bgs to 40 ft bgs. Limited information is known about the aquifer, but aquifer pumping tests conducted in 2004 indicate that there is a shallow unconfined aquifer in unconsolidated sediments underlain by a deeper partially confined sandstone aquifer (Millenium Science & Engineering, 2004). Albion is not within a Critical Ground Water Area nor a Ground Water Management Area.

2.2.3 Fauna, Flora, and Natural Communities

The only species listed as threatened or endangered in the proposed project area is the Canada Lynx. There are no critical habitats in the area, nor are there any refuge lands or fish hatcheries. The Golden Eagle is a migratory bird present in the area which is protected by the Migratory Bird Treaty Act and by the Bald and Golden Eagle Act. A U.S. Fish & Wildlife Service IPaC resource list is included in Appendix A.

2.2.4 Zoning, Land Use, and Development

Zoning in the City of Albion is based on four classifications shown in Figure 2-5: Commercial, Residential, Residential-Agricultural, and Public (City of Albion, 2021). Figure 2-5 illustrates zoned areas in and around Albion. Recent trends indicate sustained residential growth in the residential areas of the City on existing lots.

According to the mayor, annexation of most areas surrounding the City in the future is unlikely because the current City boundary mostly matches the extent of the City owned electric utility, and revenue from the electrical sales is used to fund City operations and infrastructure such as water and sewer. However, one area on the northwest corner of the City (see Figure 2-6) is still within the City's electric utility and therefore may be annexed in in the future.

2.2.5 Cultural Resources (Historical & Archaeological)

Several entries exist on the National Register of Historic Places for architecture and education within the City of Albion and are provided in Table 2-1.

Table 2-1 Albion Cultural Resources[1]

Title	Address	Date of Register
Albion Methodist Church	102 North St	9/4/1986
Albion Normal School Campus	Off ID 77	11/28/1980
Swanger Hall	Albion State Normal School campus	9/20/1978

None of the registered historical structures found within the City, nor any of the nearby historical resources, will be significantly impacted as part of this study and the subsequent recommendations.

2.2.6 Utility Use

City residents have access to the City's public water system, sewer system, and the City-owned public electrical utility, Albion Light. The sewer system consists of a gravity sewer collection network, a single lift station and pressure sewer line, and two facultative lagoon cells and a land application system just west of town. The City contracts with Raft River Rural Electric to maintain the electrical distribution system. Telephone and communications is provided by the Albion Telephone Company, which owns and operates a fiber optic network in the City. Additionally, most residents have access to, and are encouraged to use, the City's surface water right for irrigation, which is delivered via a network of open ditches throughout town. There is no natural gas distribution system in the City.

2.2.7 Floodplains/Wetlands

A majority of Albion lies outside of the 100-year flood plain. However, low-lying areas in the center of town and along Marsh Creek are within the designated 100-year flood area. This flood area is delineated in Figure 2-7. The flood areas identified would impact areas currently zoned by the City for residential and commercial uses. A copy of the Flood Insurance Rate Maps (FIRM) for Albion can be found in Appendix A (Federal Emergency Management Agency, 2021). There are no wetlands in or near the city of Albion as shown in Figure 2-8. (National Wetlands Inventory, 2021)

[1] (National Park Service, 2021)

There are no wetlands in this project area. Marsh Creek, which flows directly through the City of Albion, is the only Riverine habitat in the area (U.S. Fish and Wildlife Service, 2021).

2.2.8 Wild & Scenic Rivers

There are no wild or scenic rivers present in the city of Albion (National Wild and Scenic Rivers System, 2021).

2.2.9 Public Health & Water Quality Considerations

There are no known public health concerns related to water quality.

2.2.10 Important Farmlands Protection

Prime farmland is defined by the U.S. Department of Agriculture as:

> *"Land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban, built-up land, or water areas."*[2]

Most of the soils in the project planning area are considered either "farmland of statewide importance" or "prime farmland" (U.S. Department of Agriculture, 2021). The only soils that are not considered prime farmland are the Hutchley and Watercayon-Vitale-Rexburg soils. The location of these soils is shown in Figure 2-4. These farmlands will not be impacted significantly in the planning study area. More information on prime farmland including the USDA Soil Report and soil maps are included in Appendix A.

2.2.11 Proximity to a Sole Source Aquifer

A sole source aquifer, is defined by the Idaho Department of Environmental Quality as:

> *"…an aquifer that has been designated by EPA as the sole or principal source of drinking water for an area. As such, a designated sole source aquifer receives special protection."*[3]

The City of Albion lies in the Eastern Snake River Plain Aquifer Source Area (Environmental Protection Agency, 2021).

2.2.12 Climate

Climatic data for the City of Albion is found in Table 2-2. Since there was no data provided in the Western Regional Climate Center for Albion directly, the data has been taken from Burley, Idaho, which is approximately 18 miles north-east of Albion and has very similar climate. The data provided is the averages taken between the years of 1961 and 1990. Precipitation averages 9.15 inches per year and annual snowfall averages approximately 28 inches (Western Regional Climate Center, 2021).

[2] (Soil Science Division Staff, 2017)
[3] (Idaho Dept. of Environmental Quality, 2021)

Table 2-2 Climate Data for Albion, Idaho[4]

Month	Mean Temp (˚F)	Precipitation (Inches)	Snowfall (Inches)
January	27	0.01	8.3
February	32	0.83	4.8
March	39	0.78	3.5
April	47	0.99	1.8
May	56	0.97	0.6
June	64	0.80	0
July	73	0.29	0
August	71	0.43	0
September	61	0.49	0
October	50	0.72	1.1
November	38	0.87	1.9
December	30	0.98	5.8
Annual	**49**	**9.15**	**27.8**

2.2.13 Air Quality & Noise

Albion has no specific air quality concerns as designated by DEQ, and is not in an Area of Concern or Non-Attainment area (Idaho Department of Environmental Quality, 2021). A map of the areas with sensitive air quality is shown in Figure 2-9.

The noise levels in the planning area are consistent with other rural communities. There is no industrial facilities in the City, and issues related to noise are not generally experienced. The City's wastewater treatment lagoons are located to the east of the city and have the potential to produce odors; however, no issues have been recorded at the time of this writing.

2.2.14 Energy Production & Consumption

The City of Albion is served electricity by the Albion Light municipal public utility. There are no sources of energy production in the area aside from residential solar installations. The electricity consumption of the residents is assumed to be average for the area.

2.3 SOCIOECONOMIC PROFILE/POPULATION STATISITICS

The population of Albion has fluctuated widely throughout its history, largely due to the rise and fall of the Albion State Normal School, which was established in 1893 and closed in 1951. The population of Albion and Cassia County from the 2010 Census was 267 (Census Reporter, 2022). The most recent population estimate for Albion, conducted in 2020, listed an estimated population of 310. Based on the rate of new housing construction in the City, the mayor estimates a current and future growth rate of 2.5%. In order to provide a conservative estimate for planning purposes, this 2.5% growth rate will be used to estimate the 40-year planning period population for Albion, the results of which are shown in Table 2-3 and Figure 2-2.

[4] (Western Regional Climate Center, 2021)

Table 2-3 Projected Population of Albion

Year	Population
2020	310
2021	318
2022	326
2026	360
2031	408
2036	462
2041	524
2046	594
2051	673
2056	762
2061	864

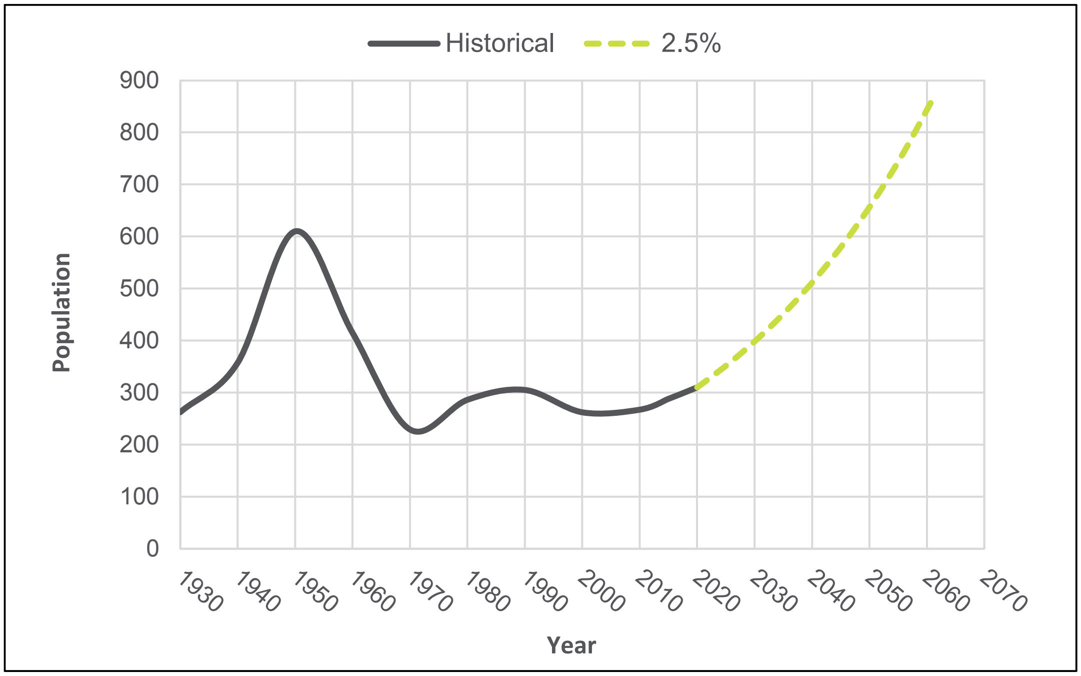


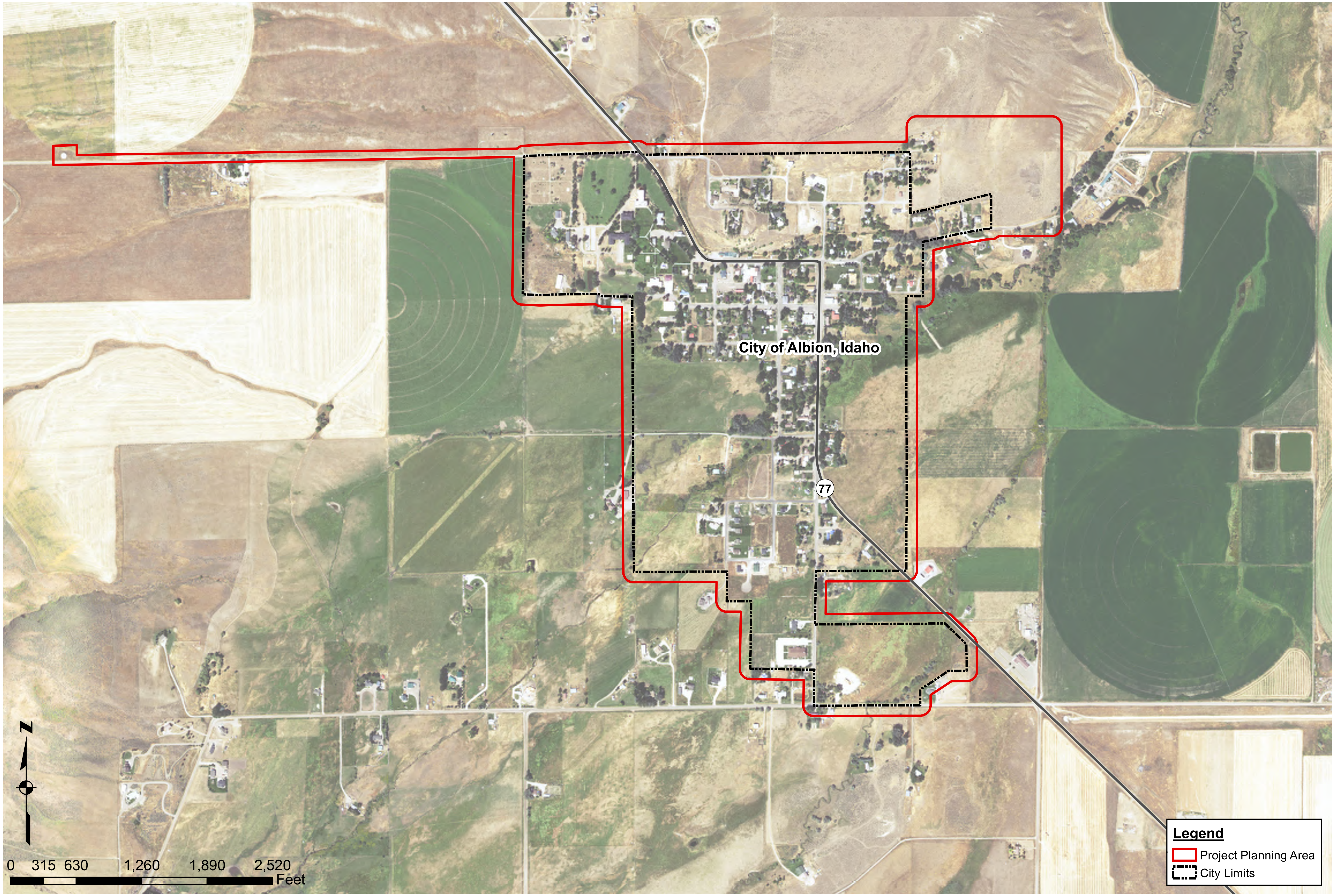
Figure 2-2 Historical & Projected Population of Albion

The growth rates of Burley, ID (the largest town in Cassia County) and Cassia County were calculated using the 2010 Census data and an estimated value for 2020 (Census Reporter, 2022) (World Population Review, 2021). The growth rate is compared to Albion's in Table 2-4. While both have an increasing population between 2010 and 2020, their growth rates are not nearly as high as that of Albion.

Table 2-4 Regional Population Growth Rates (Estimated)

Community	2020 Population	2010 - 2020
Albion	310	1.49%
Burley	10,700	0.34%
Cassia County	24,269	0.56%

Approximately 29% of the labor force is employed in the agricultural industry, 26% in transportation and communications, and 17% in the services industry (Idaho Department of Commerce, 2021). The median household income for the City is estimated to be $66,667 (Census Reporter, 2022). The results of a door-to-door Income Survey conducted in 2019 found the Low-to-Moderate Income (LMI) to be 51.18%. A summary of the survey is included in Appendix A.



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City of Albion

Water Facilities Planning Study

Project Planning Area

FIGURE NO. 2-3

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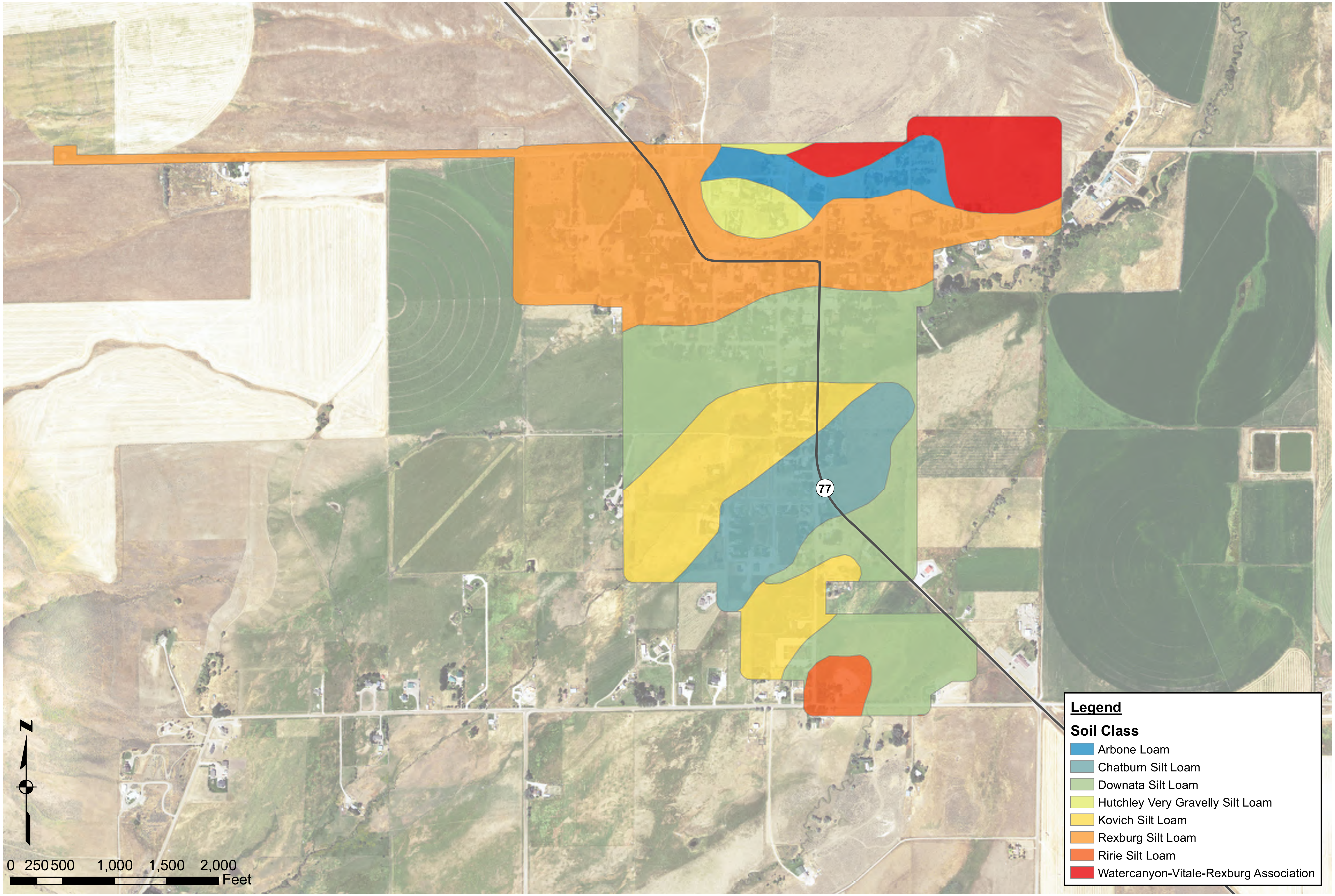

PROJECT NO. 219121

FILENAME Soil Map.mxd

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City of Albion

Water Facilities Planning Study

Soil Map

FIGURE NO. 2-4

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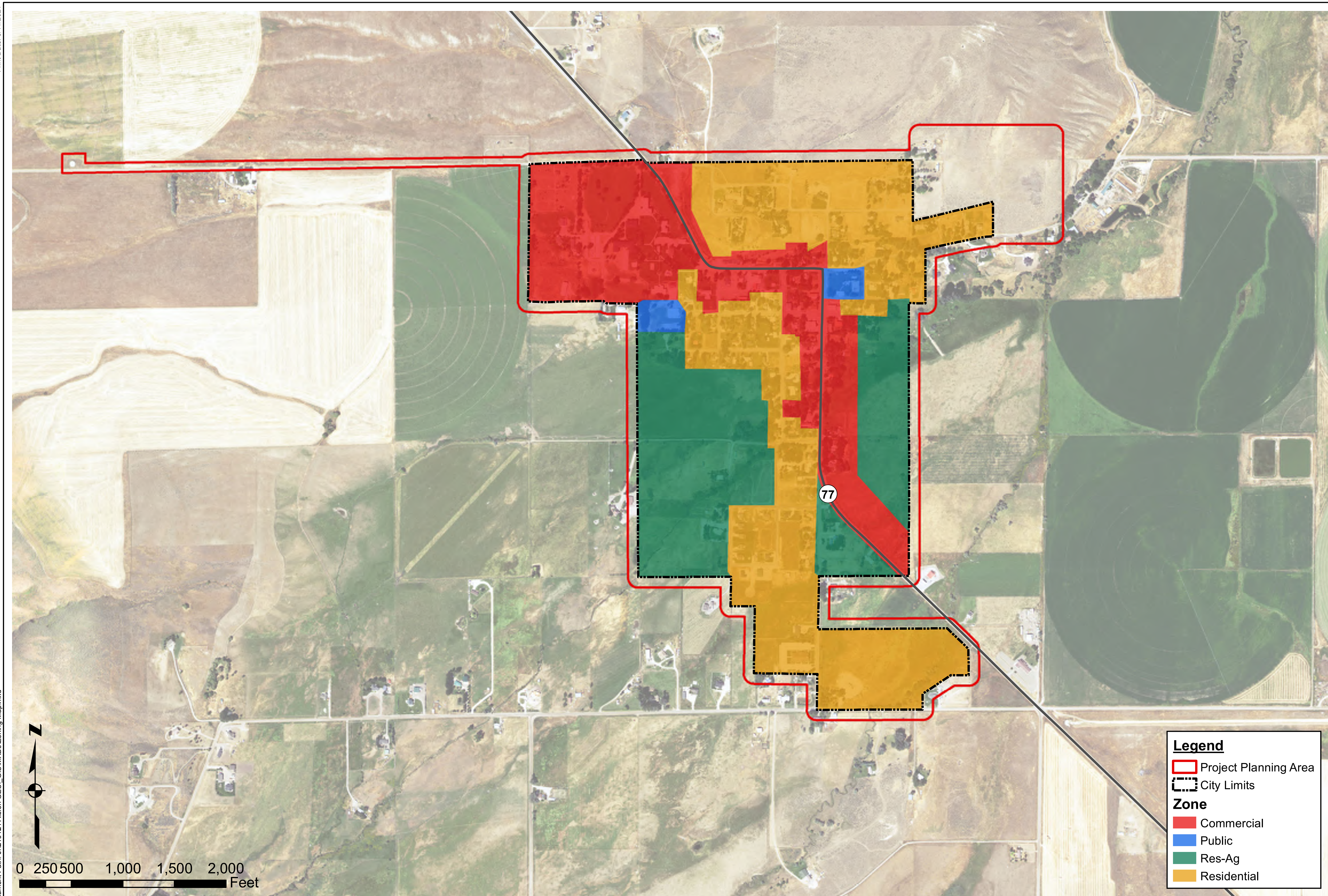

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PROJECT NO. 219121

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City of Albion

Water Facilities Planning Study

Zoning Map

FIGURE NO. 2-5

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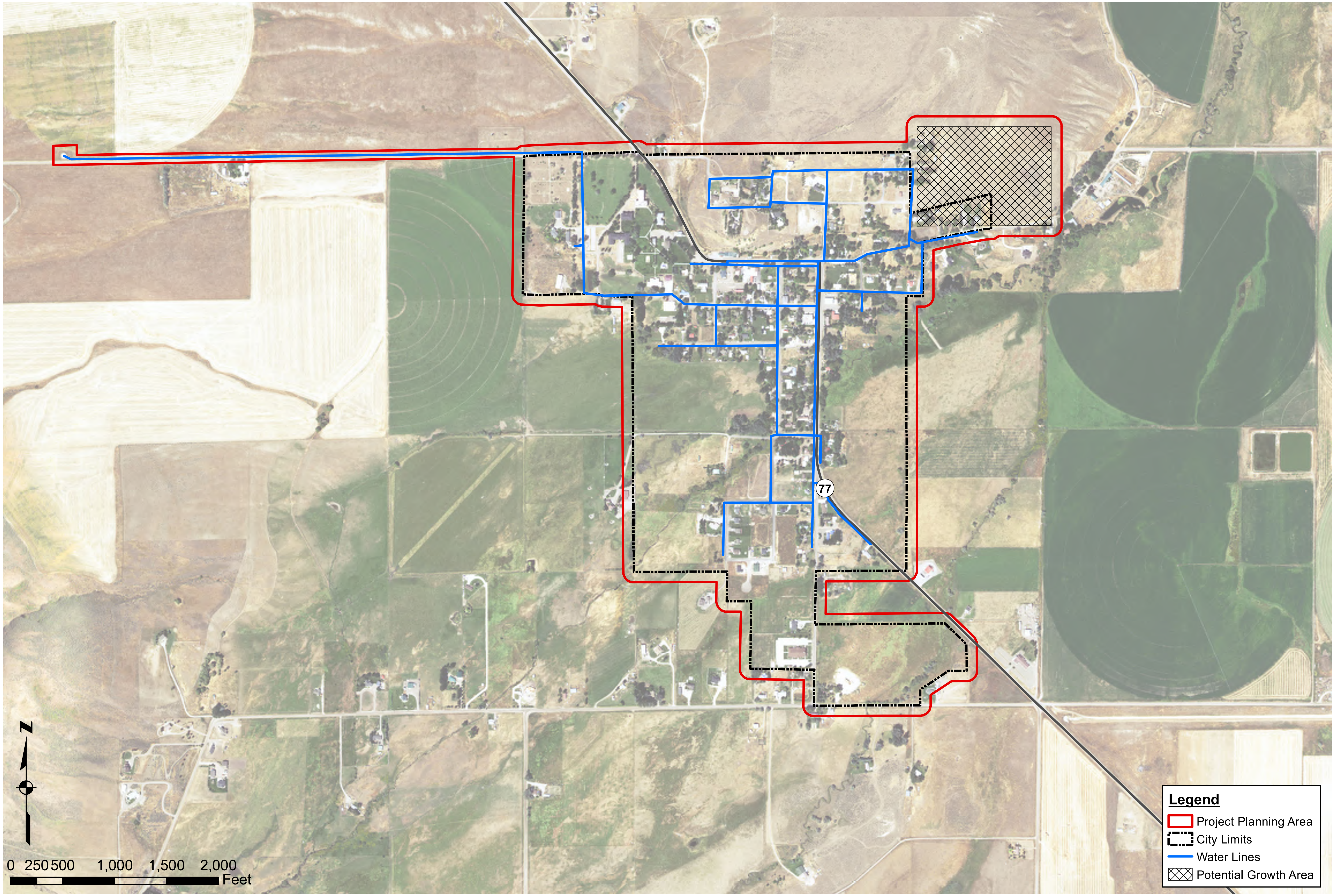

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FILENAME Growth.mxd

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City of Albion

Water Facilities Planning Study

Potential Growth Areas

FIGURE NO. 2-6

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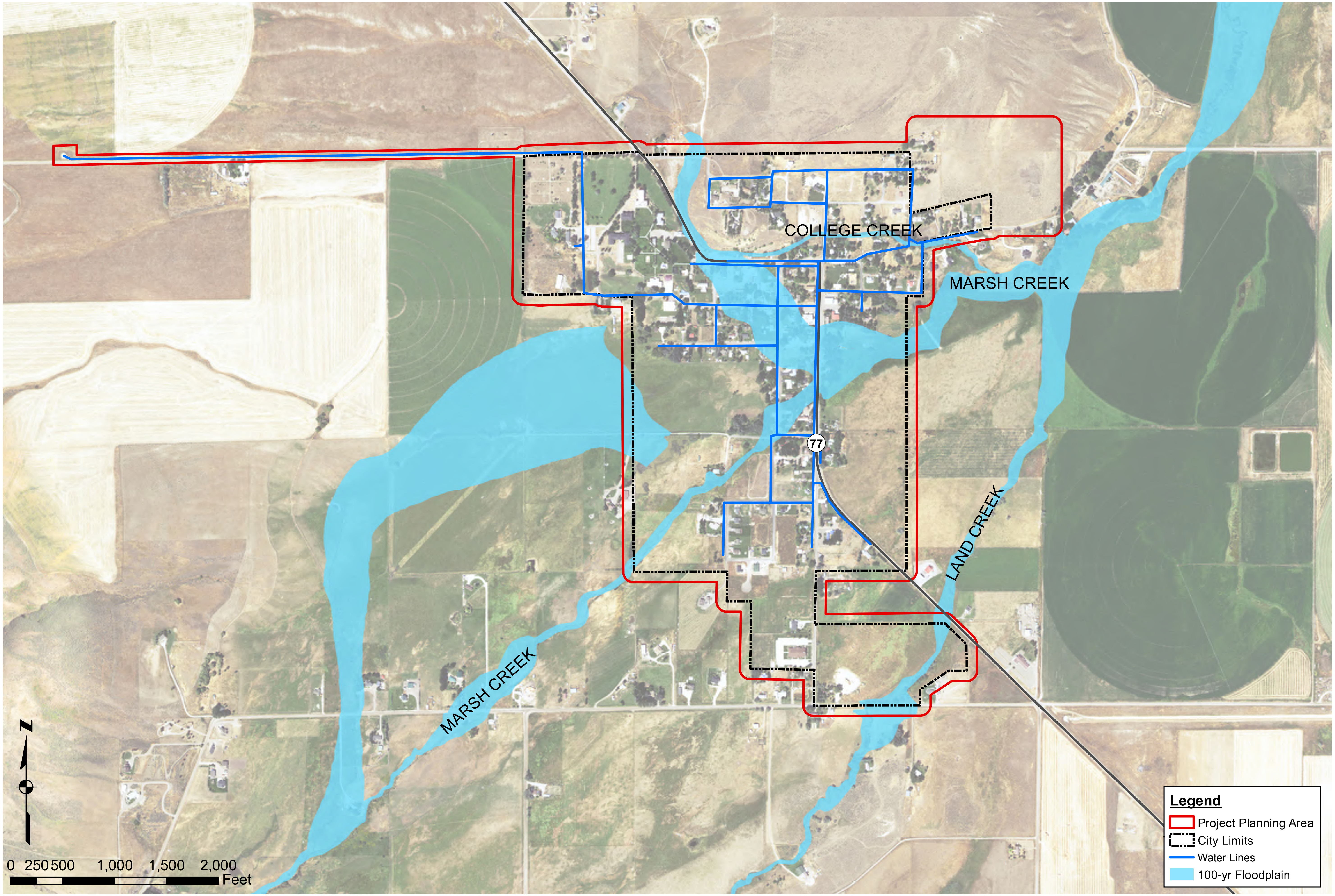

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City of Albion

Water Facilities Planning Study

100-yr Floodplain Map

FIGURE NO. 2-7

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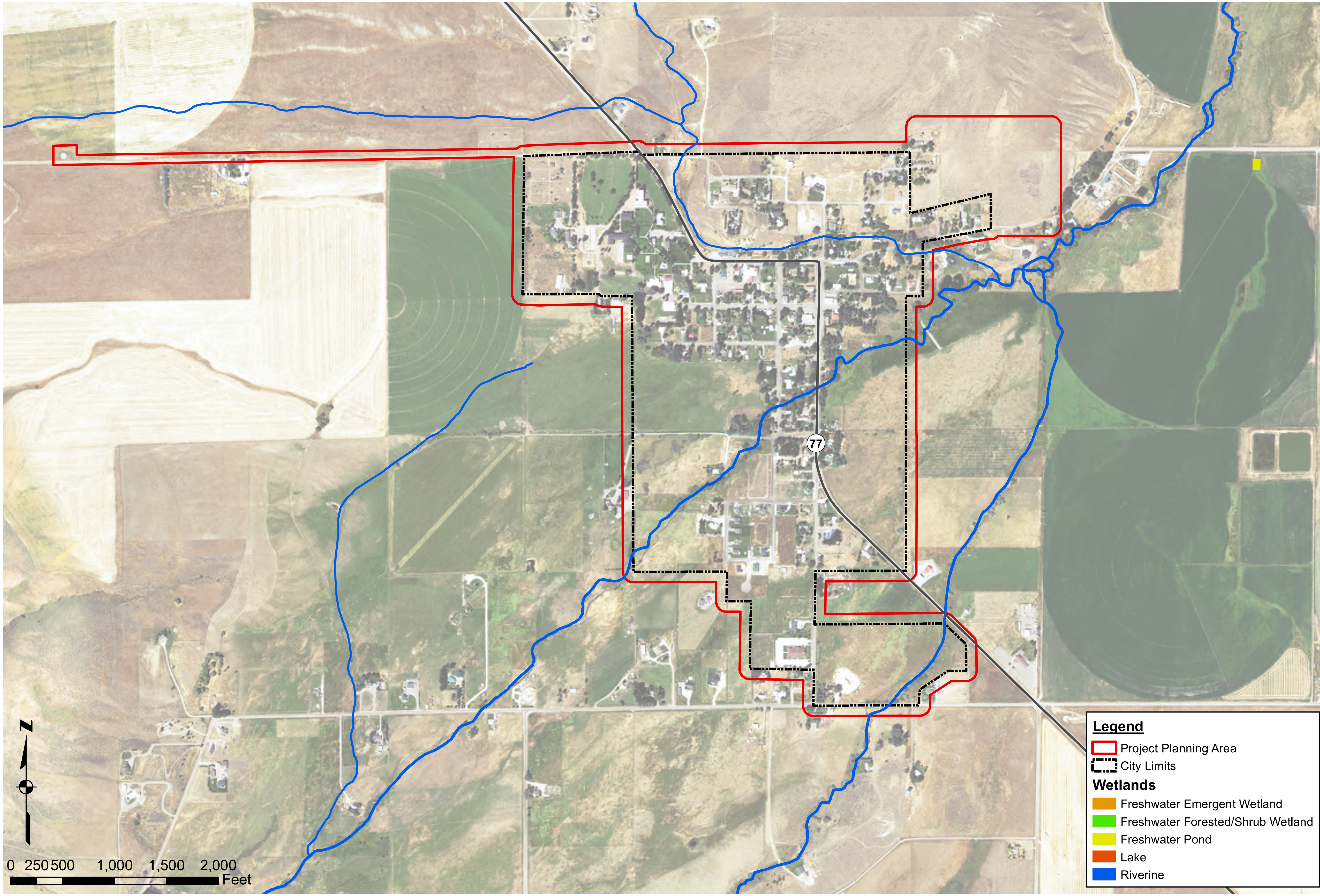


City of Albion

Water Facilities Planning Study

Wetlands Map

FIGURE NO. 2-8

PROJECT NO. 219121

FILENAME Wetlands.mxd

KELLER ASSOCIATES
305 N. 3rd Avenue
Pocatello, ID 83201
208.238.2146

Print Date: 6/15/2021

Document Path: J:\219121 Albion GES_GIS\MXDs\Wetlands.mxd

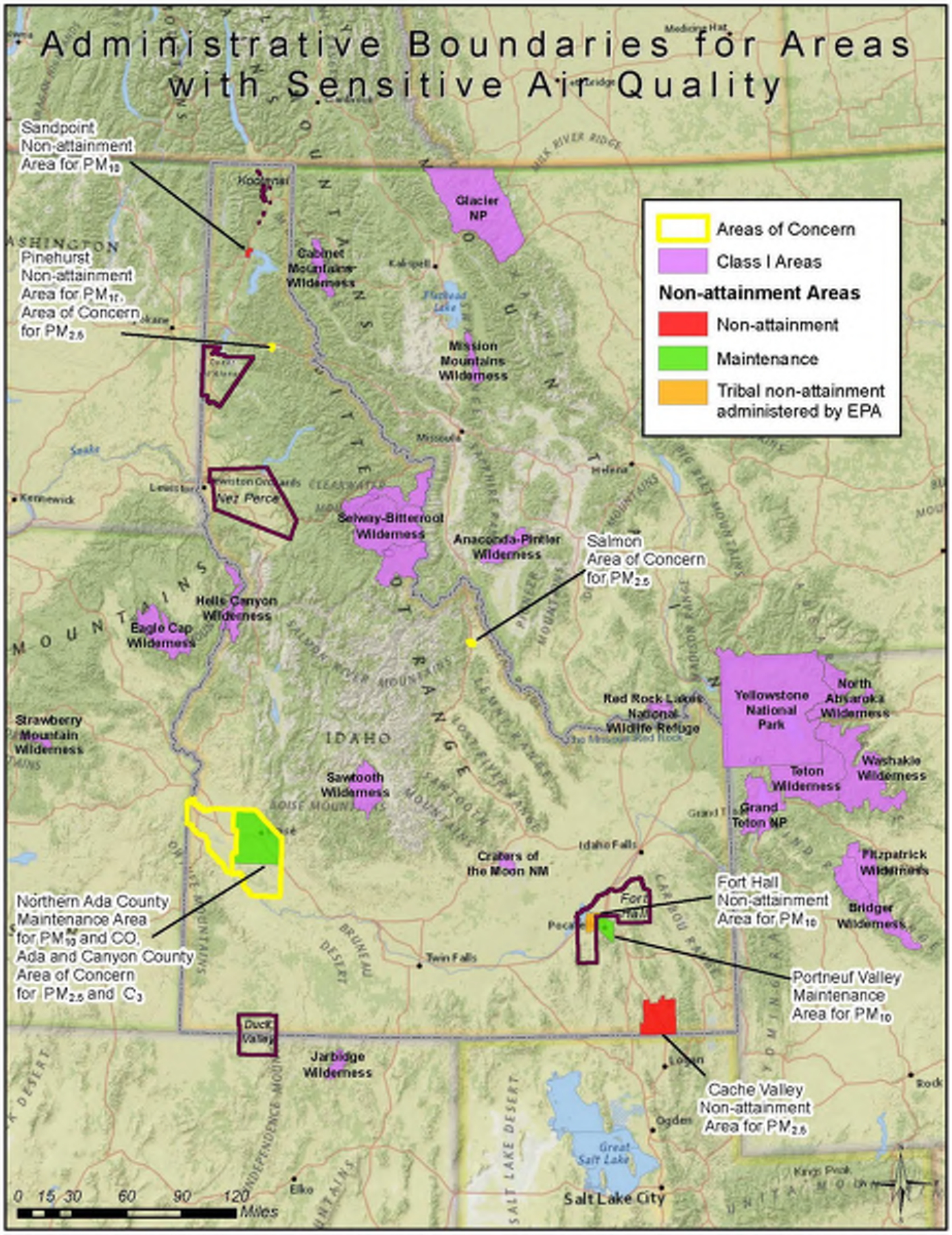


Figure 2-9 Administrative Boundaries for Areas with Sensitive Air Quality[5]

[5] (Idaho Department of Environmental Quality, 2018)

CHAPTER 3 EXISTING FACILITIES CONDITION & EVALUATION

This chapter summarizes the current condition of The City of Albion's drinking water system. Regulatory requirements are presented in the sections to which they pertain. Idaho DEQ sets rules to:

> *"…control and regulate the design, construction, operation, maintenance, and quality control of public drinking water systems to provide a degree of assurance that such systems are protected from contamination and maintained free from contaminants which may injure the health of the consumer."*[6]

3.1 SYSTEM HISTORY

Residents of Albion receive potable water from a community public water system (PWS #ID5160001. The current water system consists of three groundwater wells (Well #1, #2, and #3), a concrete water storage tank, and a distribution system. The City also owns one additional well (Well #4) that was historically used for irrigation and was abandoned in the early 2000's due to poor production. Wells #1 and #2 are classified by DEQ as "Active" and Well #3 is classified as "Inactive". Well #3 was taken offline in the mid 2010's due to sand production, but it is still used for filling water trucks. A brief recent history of the City's water system is explained below.

In 1991, Forsgren Associates, Inc. completed a water study for the City. A public record request (PRR) was sent to DEQ to request this study, but DEQ was unable to locate the study in their records. As a result of that study, in 1992 the City invested in improvements to the water system including replacement of the City's water distribution system with new services and water meters, a new 242,000 gallon water storage tank, a 12-inch PVC transmission line between the City and the storage tank, and upgrades to the City's groundwater well pumping systems and controls. An existing elevated storage tank was abandoned during those upgrades.

In 2005, the City underwent another water facility plan, this time written by Galena Engineering, Inc.. The plan generated three alternatives: 1) to increase the pumping capacity of the existing wells, 2) to drill an additional well, and 3) to construct a pressurized irrigation system (also known as a secondary water system) for the City residents. The City did not implement any of these recommendations.

3.2 WATER RESOURCES ANALYSIS

Water systems experience both daily and seasonal extremes in water demand due to usage patterns and outdoor water use in the summer months. The greatest water consumption in Albion occurs during the summer months and it is assumed to occur in the morning and evening hours as is typical in Idaho. The lowest consumption period for Albion occurs during the winter at night. Due to the variability in water demand, demand scenarios must be established to estimate water system requirements. Peak Hour Demand (PHD) is used to represent the largest single demand on a given water system in a single hour during a year. Similarly, Maximum Day Demand (MDD) and Average Day Demand (ADD) represent the maximum daily use and average daily use respectively. Each of these demand metrics was determined using daily well production meter data from 2015-2020 collected by the City of Albion.

[6] (Idaho Dept. of Environmental Quality, 2021)

3.2.1 Water Production

Production meter data from Wells #1 and #2 can be used to approximate total system requirements, taking into account water loss in the distribution system as well as water that is actually consumed by City residents. Therefore, this data may over-estimate actual usage but accurately represents system demands. Figure 3-1 shows the daily water production from 2018 through 2020, and Figure 3-2 shows the annual water production for years 2015 through 2020 with the portion of water produced by each well.

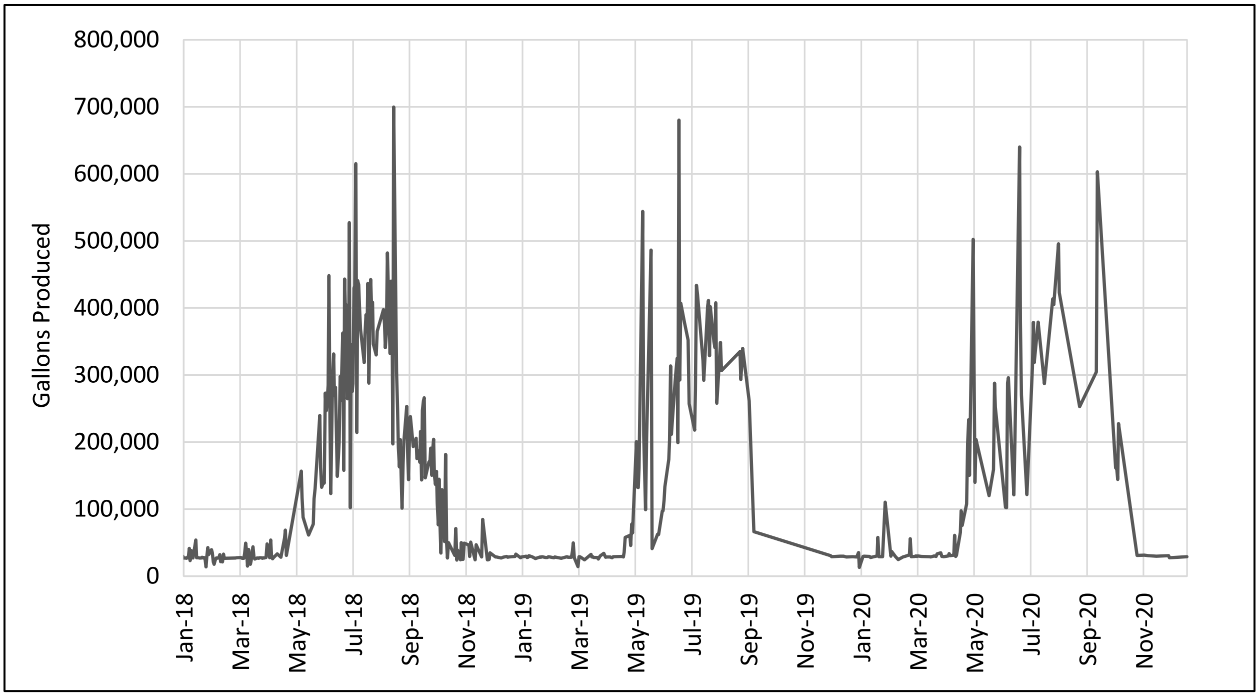


Figure 3-1 Albion Water Usage (2018 – 2020)

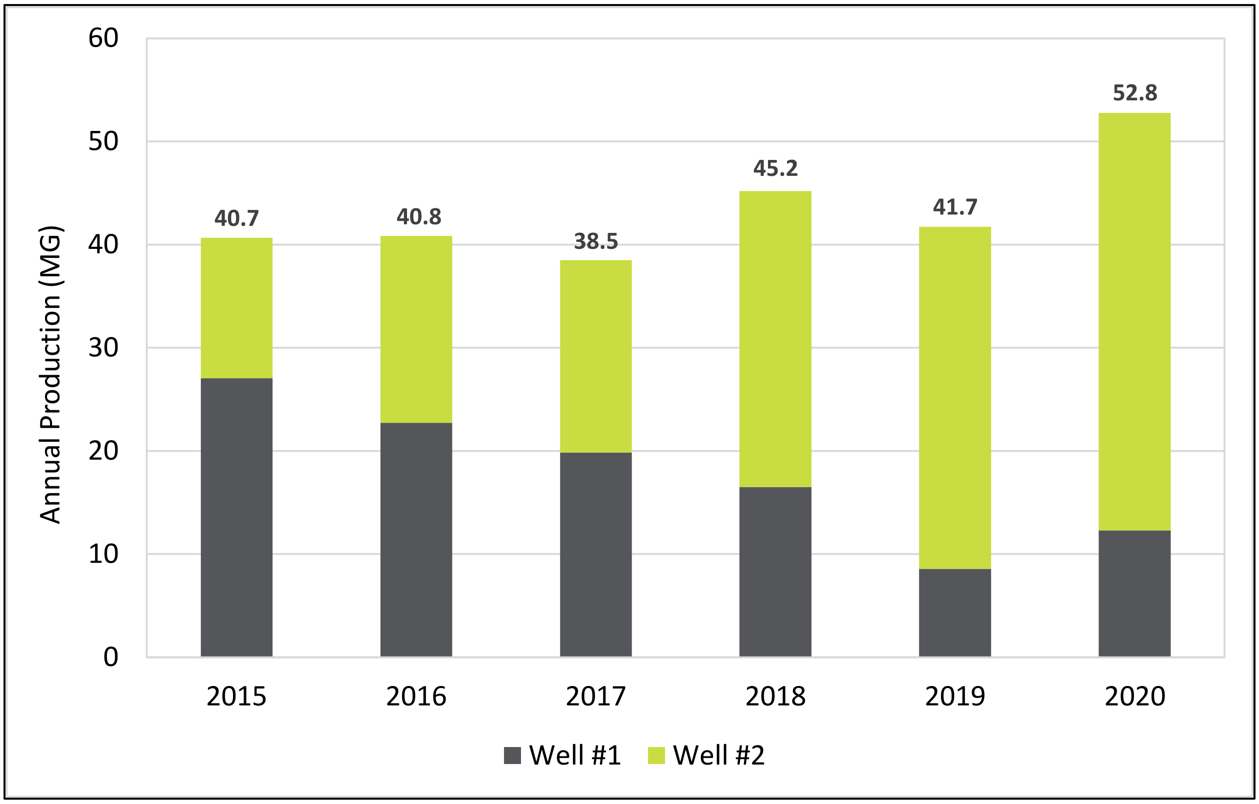


Figure 3-2 Albion Annual Water Usage (2018 – 2020)

Although 2020 had higher annual demand than the previous five years, there is not an obvious trend to indicate a consistently increasing demand. This high water use could be a result of several factors including local weather conditions causing an increase in outdoor irrigation, an increase in people working from home due to the COVID-19 pandemic, or small increases in population.

3.2.2 Water Demand

As is shown in Figure 3-1, demands in Albion vary significantly over the course of a calendar year. Winter demand (December through February) typically consists of indoor use only, while summer demand consists of indoor use and outdoor uses (e.g., irrigation). Table 3-1 shows the demand metrics for the years 2015-2020. Because hourly demand data is unknown, PHD can be estimated with the following equation

$$PHD_{gpm} = \frac{MDD}{1440} * (CN + F) + 18 \quad (1)$$

where MDD is in units of gpd/EDU, C and F are factors associated with ranges of EDUs and are taken from a table, and N is the number of EDUs in the system (Washington State Department of Health, 2009). The values of C, N, and F used in the PHD calculation are 2, 186.5, and 75, respectively.

Table 3-1 2021 Demand Metrics

Demand Scenario	Units		
	(gpd)	(gpm)	(gpcd)
Average Winter Day Demand	30,250	22	101
Average Day Demand [1]	126,050	88	396
Maximum Day Demand [2]	744,684	517	2,342
Peak Hour Demand [3]	-	1,200	-

1 Average of 2015-2020 ADD and extrapolated to 2021.
2 Taken from years 2018-2020 and extrapolated to 2021.
3 Calculation taken from Washington State Department of Health Water System Design Manual

To provide context for these demands, the ADD in the State of Idaho and the United States are 186 gpcd and 82 gpcd, respectively (U.S. Geological Survey, 2018). Thus, the ADD of Albion is over twice as high as that of the State of Idaho and almost five times as high as the corresponding value for the United States. However, the Average Winter Day Demand is only slightly larger than the national average, indicating that indoor use in Albion is fairly normal, and therefore the extremely high ADD is a result of outdoor use. Additionally, ADD, MDD, and PHD were calculated from production data rather than consumption data, and therefore the unmetered water demands (e.g., leaks in the distribution system, hydrant flushing, unmetered connections) will make these metrics appear higher than the actual residential user demands.

3.2.3 Equivalent Dwelling Units (EDU)

In 2021, there were approximately 189 connections to the water system, of which 153 are residential and the remaining 36 connections are commercial. Because the difference in consumption between residential and commercial connections in Albion do not appear to be substantial, both user types are assigned one equivalent dwelling unit (EDU), for a total of 189 EDUs. An EDU represents a demand of approximately 635 gpd.

3.2.4 Water Rights

The City of Albion holds numerous water rights which can be used for municipal purposes, which have all been decreed. The map below (Figure 3-3) shows the boundary of the water service area. This area remains the same for each water right provided in Table 3-2.

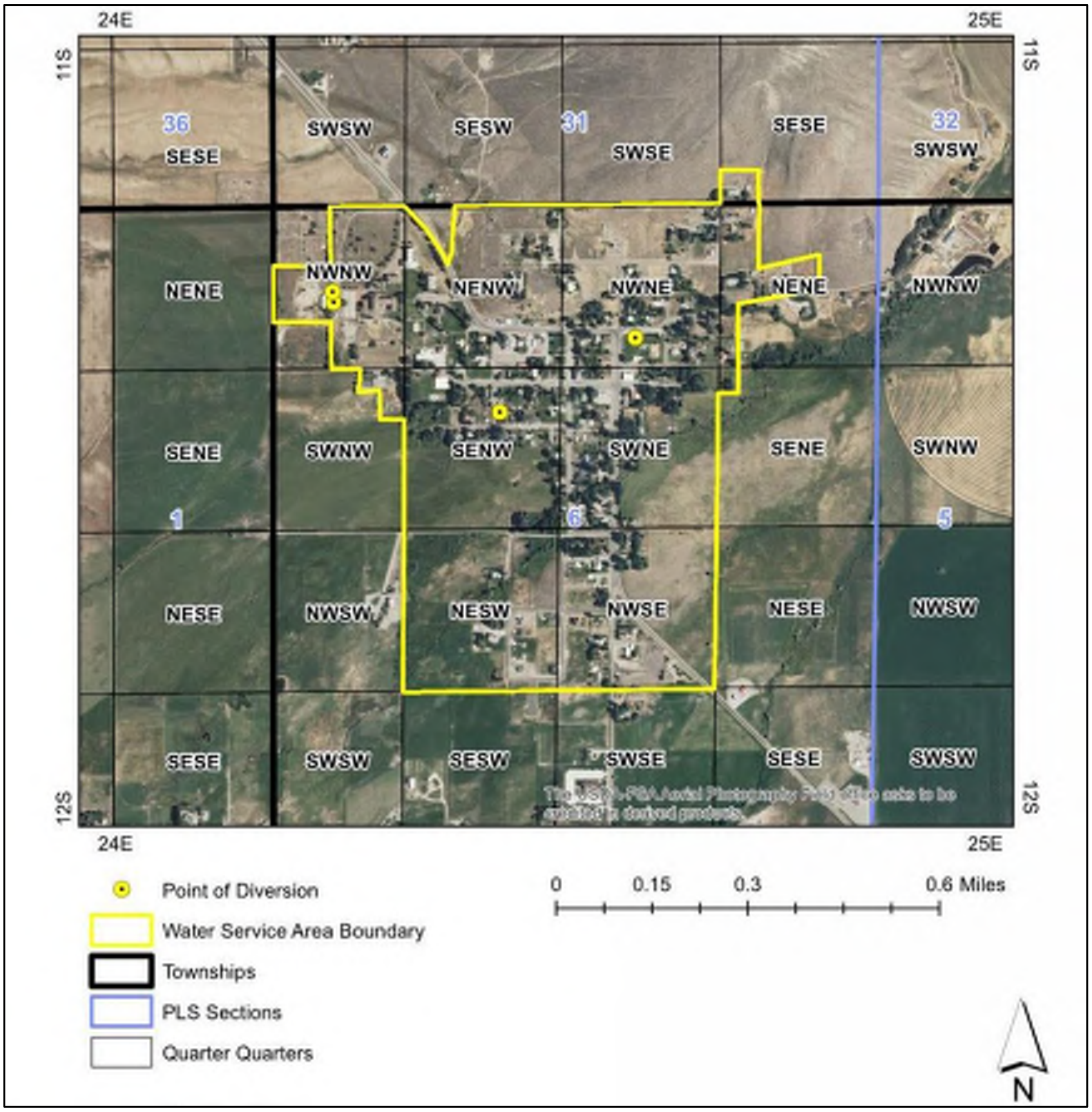


Figure 3-3 Water Service Area Boundary

Water rights held by the City of Albion are summarized in Table 3-2 and reference information for each individual right is available in Appendix B. All water rights are owned by the city of Albion and are currently active (Idaho Department of Water Resources, 2021). As shown in Table 3-2, each municipal water right is available the entire year. Therefore, none of these water rights are limited to seasonal use. The total diversion rate of all municipal water uses combined is 1.89 cfs or 848.3 gpm.

Table 3-2 Municipal Use Water Rights[7]

Water Right	Type	Priority	Availability	Rate (CFS)	Rate (gpm)
45-2725	Decreed	9/19/1966	1/1-12/31	0.6	269.3
45-10633	Decreed	12/31/1927	1/1-12/31	0.44	197.5
45-10634	Decreed	12/31/1911	1/1-12/31	0.5	224.4
45-10635	Decreed	12/31/1956	1/1-12/31	0.35	157.1
Total				**1.89**	**848.3**

In addition to these municipal use water rights, the city of Albion also has an irrigation water use. The source of this water is Marsh Creek, which is a tributary of the Snake River. This irrigation water right only runs from April 1st until October 31st, and has a diversion rate of 0.91 cfs (408.4 gpm). This water right is also decreed and is owned by the city of Albion. The priority date for this water right is 04/01/1873 and it currently has an active status. This irrigation water right has an acre limit of 37.8 acres and the map which shows the boundary of the place of use is provided below in Figure 3-4. The complete reference information about this right is provided in Appendix B.

[7] (Idaho Department of Water Resources, 2021)

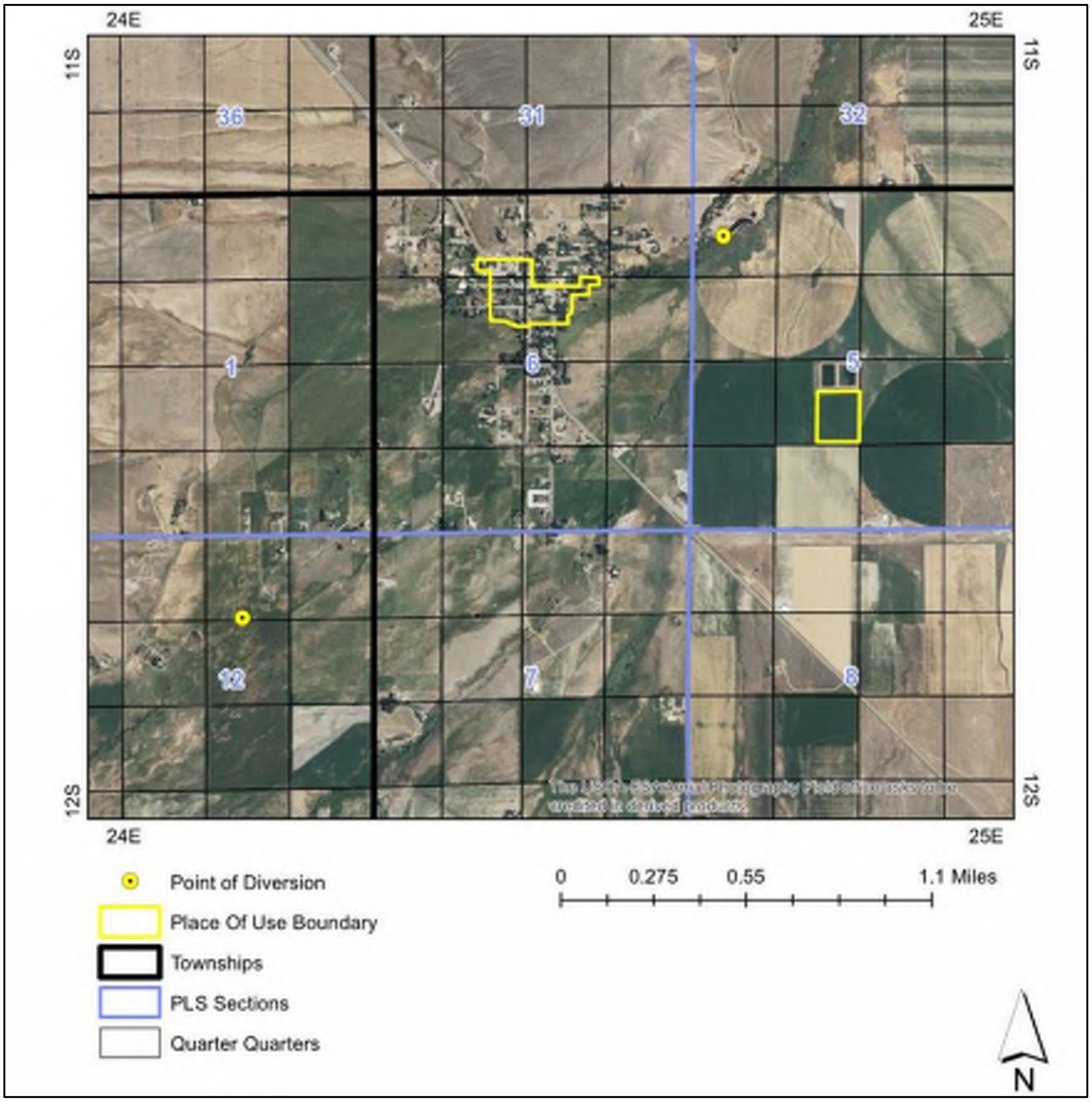


Figure 3-4 Place of Use Boundary for Irrigation Water Right

3.3 SOURCE WATER

3.3.1 Criteria

Design Basis – IDAPA requires water source facilities be designed to provide either peak hour demand or maximum day demand plus equalization storage[8]. This design requirement is intended to ensure that the water system is designed to supply a sufficient quantity of water for typical use patterns.

Ground Water Source Redundancy – IDAPA states that public water systems served by groundwater and constructed after July 1, 1985, or existing public water systems served by groundwater that are substantially modified after July 2002, shall have a minimum of two (2) sources if they are intended to serve more than twenty-five (25) homes or equivalent. Firm

[8] IDAPA 58.01.08 – Idaho Rules for Public Drinking Water Systems, § 501.03

Capacity (also known as source redundancy) is defined as a water system's pumping capacity with the largest pump or source out of service. IDAPA requires systems have sufficient firm capacity to provide either the peak hour demand of the system or maximum daily pumping demand plus equalization storage[9].

Redundant Fire Flow Capacity – IDAPA requires systems that provide fire flow be designed to provide maximum day demand plus fire flow. Pumping systems providing fire flow capacity must be designed to provide the fire flows with only the firm capacity in operation, or where sufficient fire suppression storage is provided, may be reduced accordingly. Where fire suppression storage is not provided, the fire flow requirements may be reduced under certain circumstances and conditions[10].

Well Design Criteria – According to IDAPA, wells shall be located a minimum of 50 feet from the nearest property line to meet setback requirements from specified sources of contamination set forth in Subsection 900.1. Casings shall extend at least 18" above the final ground surface. All wells shall be constructed in accordance with IDAPA's 37.03.09 Well Construction Standards. According to the Idaho public drinking water rules, a sample tap suitable for collecting biological samples is required on the discharge piping from every well and a flow meter and check valve are required for each well. Additionally, disinfection is not required for wells, but is required for systems with a surface water source or groundwater source directly influenced by surface water[11].

3.3.2 Groundwater Wells and Pumps

Table 3-3 lists well pump and well construction data, along with footnotes with the references for where this data came from. Additional information for each well is described below. The current water system relies on only Well #1 and Well #2. Well #3 was disconnected from the system a few years ago due to sand production, and Well #4 was removed from the system a couple of decades ago because of its limited capacity. Photos of the well heads for these four pumps are shown in Figure 3-5 below.

Well #1 – Well #1 is one of two water sources for the City, alternating as the lead/lag pump with Well #2. This well was constructed in 1939, and a well log for this well could not be found in DEQ or IDWR archives. The well house is a repurposed park restroom concrete masonry unit (CMU) building with a low basement. The building shows significant signs of corrosion on the steel well head (accessible through the basement) and the above grade piping materials. The water system Operator has concerns about the integrity and longevity of the existing well pump, a suspicion which was confirmed by the excessively low flow rate measured during inspection. The flow rate measured pumping into the system in July 2021 was 95 gpm, whereby the flow rate pumping into the system measured in 2003 (as stated in the 2005 water study) was 170 gpm. A dynamic water level at these two flow rates was not measured. According to available records from the three pump service companies that have worked on the City's wells, this pump was installed in 2000, which puts it at the end of its anticipated service life.

Well #2 – Well #2 is the second water source for the City, alternating as the lead/lag pump with Well #1. This pump was replaced in 2015 and in July 2021 had a measured flow rate pumping

[9] IDAPA 58.01.08 – Idaho Rules for Public Drinking Water Systems, § 501.17

[10] IDAPA 58.01.08 – Idaho Rules for Public Drinking Water Systems, § 501.18

[11] IDAPA 58.01.08 – Idaho Rules for Public Drinking Water Systems, § 300.04

into the system of 350 gpm, making this well the largest producing well in the system. The well head, piping, and electrical controls for this well look to be in good shape, although the building is in serious need of replacement, as evidenced by signs of a leaking roof and water damage on the inside walls and drip marks on the front of the electrical panels.

This well is supplied 3-phase power via an open wye-open delta transformer configuration. This configuration is sometimes found in rural situations where the majority of the electrical loads are 1-phase, and a relatively small amount of 3-phase loads exist. It is typically done to save on costs because it only requires two distribution conductors and two transformers, rather than the three conductors and transformers found in a balanced 3-phase system. For larger loads, this configuration is known to result in voltage unbalance, which causes motor overheating from current unbalance and reduced motor life (Peters, 2021). If Well #2 ever experiences problems with short motor life and/or overload tripping, this may be the cause. It is recommended to conduct power quality monitoring on this power source for a few weeks in the summer months to determine whether power quality improvements or protection should be implemented.

Well #3 – Well #3 was disconnected from the water distribution system a few years ago due to the production of sand. The exact year of its disconnection could not be confirmed by City staff. The well log for this well could not be found in DEQ or IDWR archives, which is not surprising since its estimated construction date is 1910. This well is still used for filling water trucks via a lay flat hose.

Well #4 – The history of Well #4 is not well known. It was one of the first wells in the area, drilled in the early 1900's, and was used to irrigate the City cemetery. According to PumpTech in Idaho Falls (who has since changed owners), the pump was upgraded in 1992. However, the 2005 DWFS stated that 25 Hp pump capacity greatly exceeded the well capacity, and as a result this well had been abandoned. The electrical service has since been removed and the building is in disrepair.

Table 3-3 Well and Pump Data

	Well #1	Well #2	Well #3	Well #4
Location	City Park	Vaughn St.	Campus	Campus
Pump Installation History	New pump in 2000 [1]	Turbine replaced with submersible in 2015 [2]	Pump reconditioned in 1992 [3]	Last upgraded in 1992 [3]
Pump Make	Franklin [1]	Franklin [2]	Jacuzzi (8" 4-stage) or Worthington 8L-12 5-stage [3]	American Turbine [3]
Pump Model	6" 7CLC 3-stage [1]	350STS40D8X-0466 [2]	see above	8L300 11-stage [3]
Motor (Hp)	30 [1]	40 [2]	20 [3]	25 [3]
Voltage	460VAC	460VAC	Unknown	Service Disconnected
Well Head Discharge Diameter (in)	4"	6"	3"	Unknown
Drop Pipe	Unknown	5" Black [2]	Unknown	Column

Pump Notes	3 impellers trimmed to 4.9375 [1]	None	None	Pump capacity is larger than well capacity [3]
Pump Setting	147 [1]	189 [2]	208 [3]	185 [3]
Static Water Level (ft bgs)	23 [3] - 40 [1]	30 [2]	44 [3]	52 [3]
Estimated Pumping Level (ft bgs)	Unknown	100 [4]	125 [4]	185 [4]
Design Flow (gpm)	Unknown	Unknown	Unknown	Unknown
Pump Capacity Discharging into System (gpm)	170 [5]	350 [6]	130 [5]	N/A
Max Flow Rate to Atmosphere (gpm) [5]	510	520 [7]	240	Unknown
Estimated Max Well Yield (gpm) [5]	395	Unknown	350	70-100 [3]
Estimated Drawdown to Max Well Yield (ft bgs) [5]	200	Unknown	200	185 [3]
Well Construction Date	1939 [8]	1966 [9]	1910 [8]	early 1900's [10]
Well Depth (ft bgs)	358 [11]	710 [9]	500+ [3]	187 [3]
Well Casing Diameter (in): Depth (ft bgs)	15: 0-220 12: 220-358 [10]	16: 0-258 12: 239-500 10: 492-710 [9]	16: 0-500 [3]	16 [3]
Well Casing Notes	Unknown	Perforations [9]	Unknown	Unknown
Screened Interval (ft bgs)	Unknown	110-239 239-258 492-700 [9]	Unknown	Unknown
Aquifer Storativity [4]	0.00005	Unknown	0.00005	Unknown
Aquifer Transmissivity (ft2/d) [4]	673.7	Unknown	581.7	Unknown
Surface Elev.	4720 [5]	4730 [5]	4764 [5]	Unknown
Storage Tank Elev.	N/A	4960 [5]	N/A	N/A

Source

1	Records from Layne Pumps in Twin Falls, ID
2	Records from Pump Service in Burley, ID
3	Records from Pump Tech in Idaho Falls, ID
4	Estimate
5	MSE Report, 2004
6	Pump test on 7/1/2021
7	Pump capacity was with the vertical turbine, not the newer submersible.
8	Forsgren 1991
9	Report of Well Driller, IDWR
10	2005 WFPS
11	Lithologic Log

Figure 3-5 Well #1

Figure 3-6 Well #2

Figure 3-7 Well #3

Figure 3-8 Well #4

The firm capacity is the pumping capacity with the largest pump out of service, which for the current system is 170 gpm, the design pumping capacity of Well #1. This assumes that the 95 gpm pump is replaced with a new one of similar capacity. Well logs for the three groundwater wells are included in Appendix C.

3.3.3 Source Water Assessment

According to the DEQ,

> *"Source water protection is a voluntary effort a community can undertake to prevent contamination of the source water that supplies its public water system (PWS). Preventing contaminants from entering a public water system supply greatly benefits the community by minimizing the problems that can occur from contaminants in the water supply, such as increased health risks to the public, expanded drinking water monitoring requirements, additional water treatment requirements, and expensive environmental cleanup activities."*

The last Source Water Assessment conducted for the City's water system was in 2003 (Idaho Department of Environmental Quality, 2021). The Summary Reports for the assessments of Wells #1, #2, and #3 are included in Appendix D. The assessments found that the City wells have a high susceptibility to all contamination categories (inorganic compounds, volatile organic compounds, synthetic organic compounds, and microbials).

A Source Water Protection Plan (SWPP) outlines actions the community can take to protect drinking water sources. The City completed a DEQ Certified Source Water Protection Plan in late 2020 with DEQ's Source Water Protection Planning Tool. The plan develops three priorities: 1) Education, Outreach, and Public Programs, 2) Planning, and 3) Regulations and Permits. The plan is included in Appendix D.

3.4 WATER QUALITY AND CAPACITY

3.4.1 Water Quality Criteria

Water quality standards for the City of Albion are based on the U.S. Environmental Protection Agency's (EPA) Safe Drinking Water Act (SDWA) which includes primary standards (legally enforceable) and secondary standards (not legally enforceable). Primary standards are designed to protect public health while secondary standards regulate aesthetic qualities that pose no public health issue such as taste, color, and odor. Primary standards exist for microorganisms, disinfectants, disinfection byproducts, inorganic chemicals, organic chemicals, and radionuclides (U.S. Environmental Protection Agency, 2017). These primary standards are included in Appendix D.

As required by the SDWA, the EPA has developed rules to further address water quality. The following drinking water rules are considered priority rulemakings by the EPA. A brief overview of rules which are applicable to this study is provided below; however, it should be noted that these summaries contain only an outline of the associated rule and should in no way be considered authoritative. For additional information, consult the EPA's Current Drinking Water Regulations page (U.S. Environmental Protection Agency, 2021).

Ground Water Rule
The purpose of the Ground Water Rule is to reduce the risk of illness caused by microbial contamination in public ground water systems. Viral and bacterial pathogens are found in fecal matter which can be introduced to ground water sources from leaking septic systems, leaking sewer systems, and potentially through open flow paths in the ground. This rule addresses risk through a risk-targeting approach using four components. These components are:

- Periodic sanitary surveys
- Source water monitoring
- Corrective actions
- Compliance monitoring

Total Coliform Rule
This rule was established in 1989 to protect public health by reducing fecal pathogens to minimal levels through control of total coliform bacteria, including fecal coliform and E. coli (U.S. Environmental Protection Agency, 2021). Sources of these organisms include sewage and animal wastes. Sampling requirements are based on the population served by the utility.

Nitrate Rule
The Phase II Rule, the regulation for nitrate, became effective in 1992. The MCL for nitrate is 10 mg/L or 10 ppm. Nitrate itself is reasonably non-toxic and primarily used as fertilizer for agriculture. However, when nitrates are ingested, the resultant biochemical reactions reduce the bloods' ability to oxygenate and decrease the transportation of oxygen throughout the body. This condition is known as methemoglobinemia. The ingestion of nitrates is especially harmful to infants (College of Agricultural and Life Sciences, 2007). Infants below six (6) months of age who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome. (U.S. Environmental Protection Agency, 2021).

Arsenic Rule
Long-term exposure to arsenic in drinking water has been linked to cancer of the bladder, lungs, skin, kidneys, nasal passages, liver, and prostate. Other effects of ingesting arsenic include cardiovascular, pulmonary, immunological, neurological, and endocrine effects (U.S. Environmental Protection Agency, 2017). The Arsenic Rule was published in January 2001 and changed the MCL from 50 ppb to 10 ppb (~0.01 mg/L).

Disinfectants and Disinfection Byproducts Rule
Disinfectants are used to inactivate many potentially harmful microorganisms, but they may also react with natural organic and inorganic material in drinking water, forming disinfection byproducts (DBP's). Some DBP's, such as the trihalomethane chloroform, have been shown to be carcinogenic and cause reproductive and developmental effects in laboratory animals. The Stage 1 Disinfectants and Disinfection Byproduct Rule was promulgated in December 1998 and establishes maximum residual disinfectant levels (MRDL) and MCL's for disinfection byproducts. Additionally, this rule addresses removal of total organic carbon (TOC) to minimize the production of DBP's. The Stage 2 Disinfectant and Disinfection Byproducts Rule was promulgated in December 2005 and focuses on decreasing DBP concentration peaks in the transmission and distribution system.

Radionuclide Rule
The Radionuclide Rule was promulgated in December 2000 to address exposure to radionuclides found in drinking water. This rule retains existing MCL's for combined radium-226 and radium-228, gross alpha particle radioactivity, and beta particle and photon activity; and establishes an MCL for uranium. (U.S. Environmental Protection Agency, 2017). The purpose of this rule is to reduce exposure to radionuclides in drinking water due to the increased risk of cancer from exposure.

Lead and Copper Rule
The lead and copper rule (LCR) was enacted by the EPA in 1991 to control lead and copper in drinking water. In general, the rule requires that public water systems monitor drinking water at customers taps, and sets an action level of 15 ppb for lead and 1.3 ppm for copper in more than 10% of customers taps sampled, at which point corrosion control measures must be adopted.

The LCR has since undergone various revisions. In 2020 the EPA released the final Lead and Copper Rule Revisions (LCRR), which includes: "1) the use of science-based testing to better locate elevated lead levels in drinking water, 2) establishing a trigger level to jumpstart mitigation earlier and in more communities, 3) driving more and complete lead service line replacements, 4) requiring testing in elementary schools and child care facilities, and 5) requiring water systems to identify and make public the locations of lead service lines" (Association of State Drinking Water Administrators, 2020).

Nuisance Contaminants
Some of the nuisance contaminants found in municipal water systems are hydrogen sulfide, ammonia, iron, and manganese. Where applicable, these contaminants have been compared to the National Secondary Drinking Water Regulations as set by the EPA. These are non-enforceable guidelines regulating aesthetic water quality parameters. The EPA does not have suggested guidelines for hydrogen sulfide and ammonia.

The presence of hydrogen sulfide adversely affects the smell and taste of the water. Hydrogen sulfide causes the "rotten egg" taste and odor problems commonly encountered in many wells in the area. At concentrations of 1 mg/L, hydrogen sulfide may tarnish some metals, and leave black stains on laundry and porcelain fixtures.

Ammonia is found naturally in groundwater supplies or as a result of agricultural and industrial processes. According to the studies performed by the World Health Organization, natural levels of ammonia are usually below 0.2 mg/L in groundwater. Typically, ammonia has no other impact than to the taste and smell of drinking water. Toxic effects from ammonia do not become an issue until concentrations of 200 mg/kg of body weight are reached.

Iron naturally occurs in drinking water and is typically found in concentrations ranging from 0.5 mg/L to 50 mg/L depending on the geologic characteristics of the area. Excessive iron in drinking water can cause discoloration and taste problems.

Manganese is a metal found naturally in ground and surface water supplies at concentrations ranging from 1 μg/L to 10 mg/L. Its presence in drinking water is not considered a health risk, but it can lead to discoloration and precipitate deposition on water fixtures. Iron and Manganese are responsible for the “hard” taste in many waters and can be treated by adding a polyphosphate when iron and manganese levels are low to moderate.

A chlorine residual of 0.2 mg/L in a water distribution system can be used to eliminate the growth of bacteria and other contaminants throughout the distribution system. Chlorination is also used to oxidize constituents such as hydrogen sulfide which causes “rotten egg” taste and odor problems as well as iron and manganese.

3.4.2 Water Quality Monitoring Program

As dictated in the SDWA, all community public water systems are required to sample for the above primary constituents on regular intervals (U.S. Environmental Protection Agency, 2021). DEQ has prepared a monitoring schedule report for the City. Each of the two active wells are sampled regularly. The monitoring analytes and schedule are included in Appendix D.

3.4.3 Water Quality Results

A survey of the water quality sample results indicates that the City’s water regularly meets water quality standards. There were no monitoring violations for 2020, and all analytes were below the maximum contaminant level (MCL). However, in 2019 there were multiple monitoring violations, although there were no MCL violations on record. Appendix D includes the Violation History Report for 2020, the Sampling History Report, and a report of past violations/enforcement actions dating back to 1980, taken from DEQ’s Drinking Water Branch website (Idaho Department of Environmental Quality, 2021).

3.4.4 Disinfection

The City uses sodium hypochlorite (NaOCl) for disinfection, which is dosed into the discharge lines of Wells #1 and #2. The NaOCl is purchased in boxes of one gallon jugs and transferred into the dosing tank, from which an LMI diaphragm feed pump pumps it to an injection quill. The feed pump only pumps when the pump is running and is not-flow paced. There is currently no pH or temperature monitoring conducted on the stored chlorine, although temperature is monitored and controlled in the well houses with heating and cooling equipment. The chlorine injection equipment for Well #1 is shown in Figure 3-9.

Figure 3-9 Well #1 Sodium Hypochlorite dosing equipment

The Operator claims that with the existing disinfection system it is difficult to maintain sufficient chlorine residual at certain sampling sites without receiving complaints about chlorine odor at other sites. Upon review of the distribution system map and location of chlorine injection sites, the cause of the noticeable chlorine odor is not immediately apparent, and to begin assessing the issue more information is needed about the chlorine dosing rate, residual concentrations measured, and well water quality. The configuration of the water system with the wells pumping directly into the distribution system with pressure maintained by a tank outside of town with a single transmission line is very common in cities of this size with similar topography. In cases where a water tank is close to town, separate inlet and outlet transmission lines can be practical, which can improve water age and water quality. However, this is seldom done because of the extra construction costs of installing two separate transmission lines. To address this concern, it is recommended that the Operator begin collecting data and recording on a map where issues with high or low chlorine concentrations occur and where complaints are being reported. With this data a strategic approach to addressing the issue can be created.

3.5 DISTRIBUTION SYSTEM

3.5.1 Distribution System Criteria

System Pressures

Idaho DEQ has set specific minimum water pressure requirements. Water pressures at any point in the distribution system must not be below a minimum pressure of 40 psi during Peak Hour Demand conditions, excluding fire flow[12]. Water pressure at any point in the distribution system must be maintained above 20 psi during MDD and fire flow[13]. If pressure in the system

[12] IDAPA 58.01.08 – Idaho Rules for Public Drinking Water Systems, § 552.01.b.v

[13] IDAPA 58.01.08 – Idaho Rules for Public Drinking Water Systems, § 552.01.b.i

drops below 20 psi the system is at risk of contamination and is in violation of State of Idaho regulations.

Normal operating pressures should typically range between 60 and 90 psi. Pressures above 100 psi should be controlled with pressure reducing valve stations installed in the distribution main[14]. Higher pressures typically increase the amount of water lost due to leakage and the potential for water main breaks. In systems that rely on pumping to provide pressure, excessively high pressures can be indicative of higher than needed energy consumption.

Pipe Sizing

Pipeline design is based upon meeting PHD and MDD plus fire protection while maintaining required system pressures. The following design criteria should be addressed:

- Water lines where fire hydrants are provided must be six (6) inches in diameter or larger. If fire flow is not provided, water mains should not be smaller than three (3) inches in diameter[15].
- Dead end mains should be minimized by looping the system when practical. Dead end lines should be equipped with a means of flushing at a velocity of at least 2.5 fps[16].
- Valves should be located to minimize the extent of the system exposed to contamination due to loss of pressure during repairs.
- Fire hydrants should be placed 250 to 500 ft. apart, depending upon the area served.
- System pipe sizing should reduce the velocity head to reduce friction losses. Typical pipeline velocities should be between 2.5 ft./sec and 5 ft./sec and should not exceed 10 ft./sec under any circumstance.
- Pipelines may be oversized to allow for future growth.

Cross Connection Control

A cross connection control program should take reasonable and prudent measures to prevent unsafe or contaminating materials from being discharged or drawn into the drinking water system[17]. This can occur from pipes, pumps, hydrants, water loading stations, or tanks. The cross-connection control program should include provisions for evaluating the existing system and connections, addressing connections without backflow prevention, controlling new connections, testing of backflow preventers by a licensed backflow tester, and ensuring enforcement of the program is met. The U.S. EPA has published several resources to assist small utility systems in protecting their distribution systems (U.S. Environmental Protection Agency, 2017).

3.5.2 Existing System Conditions

The City's distribution system operates as a single pressure zone. The majority of the City's water distribution lines ranges in size from 12-inch to 2-inch and is constructed almost entirely of

[14] IDAPA 58.01.08 – Idaho Rules for Public Drinking Water Systems, § 552.01.b.vi
[15] IDAPA 58.01.08 – Idaho Rules for Public Drinking Water Systems, § 542.06
[16] IDAPA 58.01.08 – Idaho Rules for Public Drinking Water Systems, § 542.09
[17] IDAPA 58.01.08 – Idaho Rules for Public Drinking Water Systems, § 543

PVC pipe that was installed in 1992. A couple of 4-inch lines service certain areas, and there are a couple of dead-end lines throughout the City. Table 3-4 provides a summary of waterline diameters and total lengths within the City.

Table 3-4 Summary of the City of Albion Water Distribution System

Pipe Diameter (in)	Approximate Length (ft)	Approximate Length (miles)	Percent of Total
2	845	0.16	2.7%
4	1,427	0.27	4.6%
6	19,917	3.77	64.6%
10	966	0.18	3.1%
12	7,660	1.45	24.9%
Total	30,814	5.84	100.0%

System pressures throughout the distribution system range from 56 to 104 psi. Each service connection has a pressure reducing valve located in the meter box.

A comparison of winter month production meter readings and end-user meter readings (explained in Section 3.11.1) indicate that there is not likely to be much water loss due to leaks. This observation, combined with the relatively young age of the distribution system, indicate that the distribution system is in decent condition.

Water Meters – Water meters are found on every connection throughout the City except for the City park, and users are billed according to their usage. Water meters were originally installed during the 1992 distribution system improvements project, and City staff estimate that most of the meters were replaced 10-15 years ago. The water meters currently in service include a combination of Sensus SRIIs, Sensus iPERLs, and Neptune. They are installed in 48" tall Mueller Thermacoil meter pits on 1-inch service lines. Meters are read monthly with a TouchRead system.

Manufacturers typically recommend that residential water meters be replaced every 15-25 years, because as the meters age their accuracy decreases. The loss of accuracy results in water usage not being billed for, and therefore poor water accounting and potential lost revenue. Additionally, it should be assumed that meters older than 2011 likely contain quantities of lead that don't meet the "lead-free" definition of the Reduction of Lead in Drinking Water Act (RLDWA), and therefore if service on the meter is necessary they should not be replaced instead of repaired. Under the RLDWA it is illegal in the United States to use pipes, pipe fittings, plumbing fittings or fixtures that come into contact with drinking water that do not meet the definition of lead free, which is defined as a weighted average of 0.25% lead calculated across the wetted surfaces of a pipe, pipe fitting, plumbing fitting, and fixture and 0.2% lead for solder and flux. All new meters, pipe saddles, etc., that are installed have to meet this new definition as well as any parts that are used in repairs (U.S. Environmental Protection Agency, 2021).

Air Release Valves – According to the Record Drawings from the City's 1992 distribution systems upgrades project, there are three air release valves in the distribution system; one is located on Mountain View Dr, the second is located on E 800 S, and the third is located on

Pierce St. During fire flow testing in July 2021, only the valve on Mountain View Drive could be located. The other two valves are either non-existant or have since been buried.

3.5.3 Fire Protection Requirements

Providing adequate fire protection in residential and commercial zones often governs distribution pipeline sizes, pipe looping requirements, and reservoir storage needs. The *Idaho Rules for Public Drinking Water* requires that the water system maintain residual pressures of 20 psi during a maximum day demand and fire event to minimize the risk of contamination to the water system[18]. Pumping systems supporting fire flow capacity must be designed so that the maximum day demand and fire flow demand may be provided simultaneously with any pump out of service.

Fire suppression storage reduces the requirement for redundant pumping capacity[19]. The Albion Fire Department follows the State Fire Marshall recommendations, who has adopted the *2018 International Fire Code*. The minimum fire flow and flow duration for a structure depends on the occupancy type, fire-flow calculation area, the construction type, and whether the building has a fire sprinkler system. Building occupancy and construction types are defined in the *2018 International Building Code*. Minimum fire flow calculations can be found in *Appendix B Fire Flow Requirements for Buildings* in the fire code. A detailed analysis of the correct fire flow ratings for the buildings in Albion is beyond the scope of this report. However, the Albion Fire Chief stated that he would happy if a minimum fire flow of 1,000 gpm for residential facilities could be attained. Therefore, the needed fire flow assumed herein for residential areas is 1,000 gpm. Needed fire flows for larger and/or commercial buildings were provided by the Idaho Surveying and Rating Bureau (ISRB). Table 3-6 lists these buildings and their respective needed fire flows.

The needed fire flow duration used by the ISRB is from the Fire Suppression Rating Schedule as published by Insurance Services Office, Inc. (ISO). A summary of the durations is provided below. If a building has fire sprinklers, these requirements may be modified.

Table 3-5 Needed Fire Flow Duration

Facility Type & Needed Fire Flow	Needed Fire Flow Duration
Residential ≤ 4,800 sq. ft.	1 hour
Commercial ≤ 2,500 gpm	2 hours
Commercial 3,000 gpm – 3,500 gpm	3 hours
Residential or Commercial ≥ 3,500 gpm	4 hours

Per International Fire Code, commercial buildings and residential buildings should be located a minimum of 400 feet and 600 feet from a fire hydrant, respectively. Some municipalities have fire hydrants spaced closer at 300 feet. Figure 3-11 shows a 400-foot buffer around the fire hydrants inside the City limits. Note that there is one additional hydrant located in front of a residence up close to the tank. From the map, there are two areas that could use an additional fire hydrant. These areas are discussed further in Section 5.2.

[18] IDAPA 58.01.08 – Idaho Rules for Public Drinking Water Systems, § 552.01.b.i

[19] IDAPA 58.01.08 – Idaho Rules for Public Drinking Water Systems, § 501.18

Table 3-6 ISRB Fire Flow Requirements (2021)

Hydrant Occupancy	Hydrant Location	Needed Fire Flow (gpm)
Albion Bed and Breakfast	Market St	1,250
Albion Elementary School	Market St	2,000
Albion Café	North St	1,750
Miller Hall Retreats LLC	North St	1,250

3.5.4 Distribution System Hydraulic Analysis

A software hydraulic model helps to identify areas in the City's distribution system with inadequate fire flows or low pressures during fire flow events. Bentley *WaterCAD CONNECT Edition Update 3* software was used to create the hydraulic model for the Albion's water system. The software applies the Hazen-Williams formula in an iterative manner for complex networks to determine system pressures based on various flow scenarios. The software also has the ability to determine fire flow demand (FF) available to each node by systematically analyzing each node (pipe junction) at different flow rates, and checking every node to determine the maximum amount of water available at the node without drawing pressure levels below the minimum allowable at any node in the system. Minimum pressure requirements during PHD and fire flow demand scenarios are to be based on the lowest water storage level after operational, equalization and fire suppression storage have been exhausted[20]. Residential buildings were assigned a fire flow requirement of 1,000 gpm, and all buildings with required flows greater than 1,500 gpm were evaluated individually.

3.5.5 Model Development

Information regarding pipe diameters, network connectivity, and material types were determined through available record drawings, previous studies, and consultations with staff familiar with the water system. Elevation data for the model is based on a 10-meter DEM from the National Elevation Dataset published by the U.S. Geological Survey (USGS) and verified based on Google Earth DEM capabilities (Google, 2021). Demands (flows) were distributed to the nearest nodes based on individual connections within Albion.

3.5.6 Model Calibration

Model calibration refers to the process of adjusting model parameters, so that the model outputs match the observed field conditions. For this study, fire hydrant flow tests served as the basis for model calibration. A series of FF tests were conducted in July of 2021 by Keller Associates and Albion staff. Static and residual pressures (i.e. pressures before and during the FF tests), and flows were recorded for each of the tests. The data sheets from the testing and a map showing locations of the fire flow testing are included in Appendix E. The estimated daily flow was determined from well production records on the days previous to testing and a flow of 278 gpm was used in the calibration.

A comparison of model versus field pressures was conducted to determine the accuracy of the model in replicating water system conditions. Table 3-7 summarizes fire flow testing results and

[20] IDAPA 58.01.08 – Idaho Rules for Public Drinking Water Systems, § 552.01.b.viii

shows a comparison between the field observed values and the calibrated modeled values. The “error” column represents the pressure difference between the field measurement and the model result. A positive difference means the model under predicts the pressure drop, and a negative difference means the model over predicts the pressure drop.

Table 3-7: Fire Hydrant Calibration Results

			Pressure Hyd. A		Pressure Hyd. B		Residual Error (psi)	
			Static	Resid.	Static	Resid.	Hyd. A	Hyd. B
Test 1	Flow (gpm)	Field (psi)	70	34	80	54	*1*	*0*
	839	Model (psi)	70	35	82	54		
Test 2	Flow (gpm)	Field (psi)	96	51	94	60	*1*	*5*
	1,007	Model (psi)	95	52	95	65		
Test 3	Flow (gpm)	Field (psi)	85	44	87	76	*-1*	*-1*
	872	Model (psi)	86	43	89	75		
Test 4	Flow (gpm)	Field (psi)	76	30	76	30	*-2*	*-2*
	732	Model (psi)	78	28	78	28		
Test 5	Flow (gpm)	Field (psi)	81	33	85	40	*-1*	*2*
	751	Model (psi)	83	32	88	42		

The calibration resulted in a model that reflects the actual static conditions of the water system very well. During calibration, it was observed that there seems to be some closed or partially closed valves in the system as modeled residual pressures were much higher than observed in the field. This information was relayed to the operator to verify. The above model residual pressures were simulated by partially closing a valve to increase the headloss to be able to match field observed residual pressures.

Development of a well calibrated model not only serves as a planning tool for future development, but can also be very useful for regular management of the existing system. It is recommended that the City update the model to reflect changes in physical attributes and usage patterns of the water system. This would help the City quickly identify possible causes for problems they are seeing in the system.

With the calibrated model, the current distribution system has been evaluated for compliance with pressure and flow standards, after opening the assumed partially closed valves. The following sections summarize the results. The system was analyzed using a steady state evaluation.

3.5.7 Maximum Day Demand plus Fire Flow (MDD + FF)

The model was populated using a base fire flow demand of 1,000 gpm and increased fire flows where identified by the ISRB presented in Table 3-6. Under 2021 maximum day demands of 517 gpm and the FF requirements stated, the system was tested with the criterion of pressures not dropping below 24 psi as a slight buffer. A maximum velocity constraint was not used. The tank was assumed to be approximately half-full initially.

The water model evaluates each of the nodes individually under the previously stated criteria, while considering pressure at other nodes in the system. The analysis is steady state and assumes adequate fire storage is provided to support the design durations. The model predicted that most of the system can meet fire flow requirements with the exception of five locations all on dead end lines (see Figure 3-12). Results are presented in Appendix E. Suggested improvements will be discussed in a subsequent section of this report.

3.5.8 Peak Hour Demand

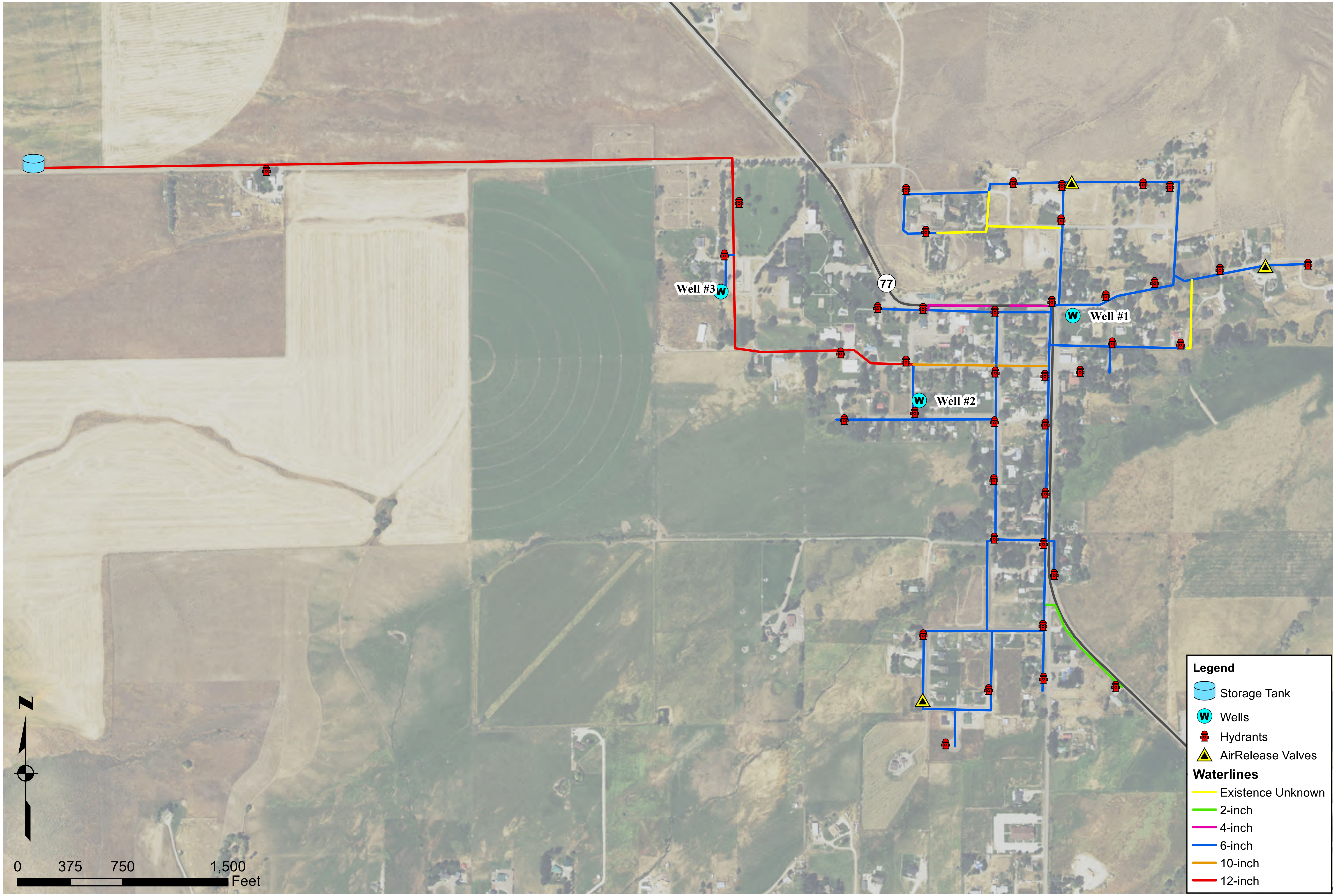
The system was modeled under current peak hour demands (PHD) of 1200 gpm to check for pressures in the system dropping below 40 psi. The initial tank level was assumed to be half full. Model results indicate that there are no areas of low pressure during the PHD except the two nodes closest to the water tank. Model results are included in Appendix E.

3.5.9 Pressures During Low Demands

Because potable water demands are variable throughout the calendar year, a low demand scenario was evaluated to determine whether any of the distribution system pressures are over 80 psi. The average day demand (ADD) of 88 gpm was used and the tank level was assumed to be full. The model predicted that at low demand periods the system is subject to some high system pressures up to 104 psi. Model results are shown on Figure 3-13. Pressures between 40-80 are shown in green, 80-100 are shown in orange, and the two nodes over 100 psi are shown in magenta. Model results are included in Appendix E.

3.5.10 Unidirectional Flushing Plan

The City performs distribution system flushing once per year as part of a valve and hydrant maintenance program, as well as to remove sediment and particulates from the pipe network. For flushing to be most effective, rather than opening hydrants at random, a uni-directional flushing plan should be implemented. A good plan should include isolation valve exercising and ensure minimum velocities are met for adequate flushing. It should also make sure that hydrants are sequenced in a fashion that avoids flushed water (and the contaminants it can carry) unintentionally entering other areas of the distribution system. Additionally, each hydrant should be operated annually to exercise the moving parts, and a good record keeping system should be put in place to aid in the coordination of repairs.



PROJECT NO. 219121

FILENAME

KELLER ASSOCIATES
305 N. 3rd Avenue
Pocatello, ID 83201
208.238.2146

City of Albion

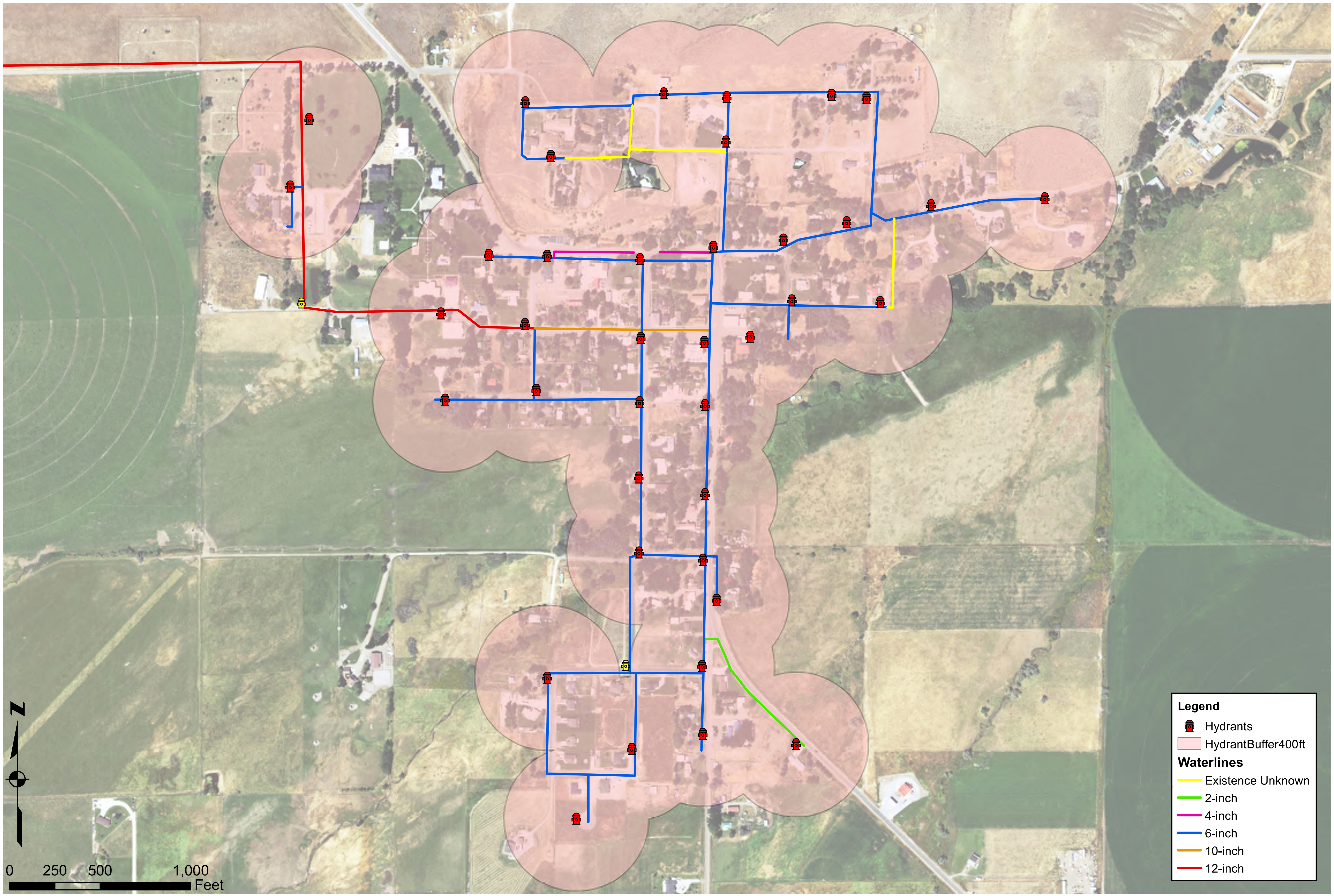
Water Facilities Planning Study

Existing Water Distribution System

FIGURE NO. 3-10

Print Date: 4/5/2022
Document Path: J:\219121 Albion GES_GIS\MXDs\Water System.mxd

Print Date: 4/5/2022



PROJECT NO. 219121

FILENAME Hydrant Coverage.mxd

KELLER ASSOCIATES
305 N. 3rd Avenue
Pocatello, ID 83201
208.238.2146

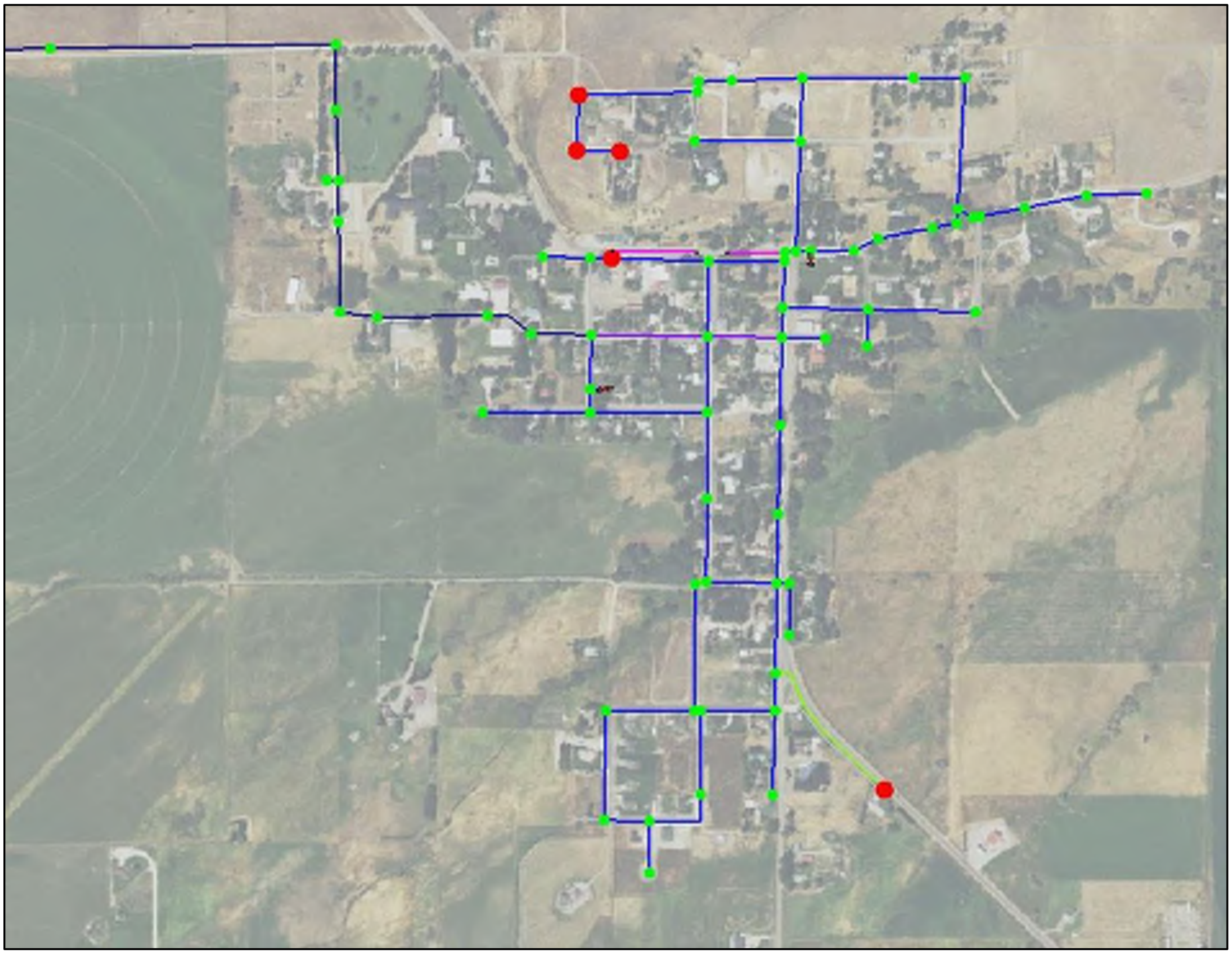
City of Albion

Water Facilities Planning Study

Fire Hydrant Coverage

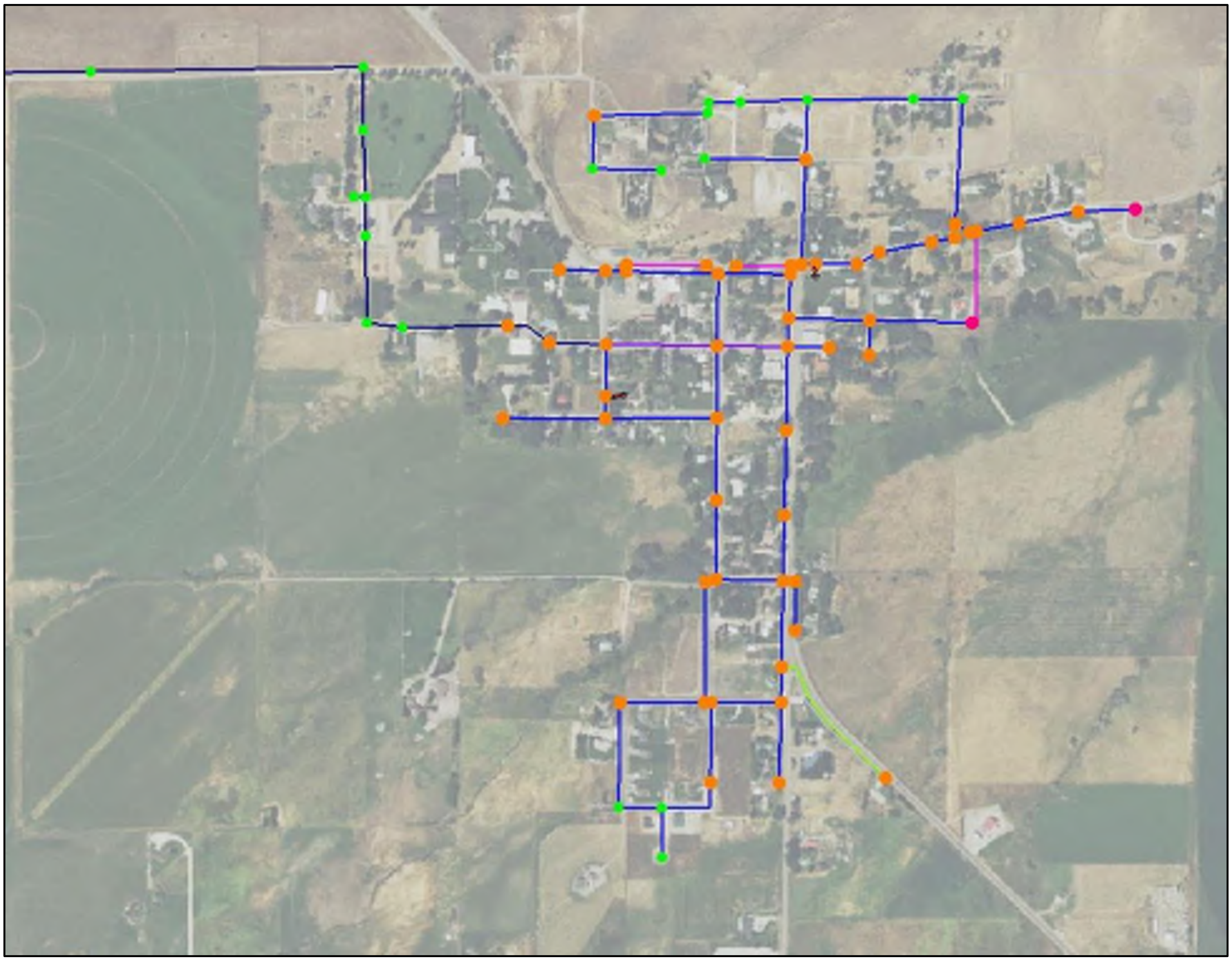
FIGURE NO. 3-11

Document Path: J:\219121 Albion GES_GIS\MXDs\Hydrant Coverage.mxd



(Green = Satisfactory, Red = Unsatisfactory)

Figure 3-12 2021 MDD + FF Results



(Green = 40-80 psi, Orange = 80-100 psi, Magenta >= 100 psi)

Figure 3-13 2021 ADD Results

3.6 STORAGE EVALUATION

3.6.1 Storage Criteria

Water storage is typically composed of several components including operational storage, peaking storage, fire storage, emergency storage, dead storage, and freeboard. Figure 3-14 illustrates these storage components.

- Operational: Storage component that supplies water to the distribution system when, under normal conditions, other sources are off. This volume is typically sized to minimize pump cycling and water stagnation.
- Peaking: Peaking storage (also referred to as equalization storage) refers to the storage required to meet peak demands and fluctuations in demand throughout the day.
- Fire: The water needed to support fire flow in systems that provide it. The fire storage volume is typically calculated from the largest needed fire flow in the system after subtracting the contribution of firm pumping capacity.
- Emergency: Idaho DEQ requires a minimum water storage of 8 hours at average day demand. This volume can be offset or eliminated if the system has sufficient dedicated standby power at its water sources.
- Dead: Storage in the bottom of the tank that can't be used due to slopes, silt traps, or outlet elevations.
- Freeboard: Space above overflow pipe and below the tank roof. This space minimizes the risk of water waste from overtopping.

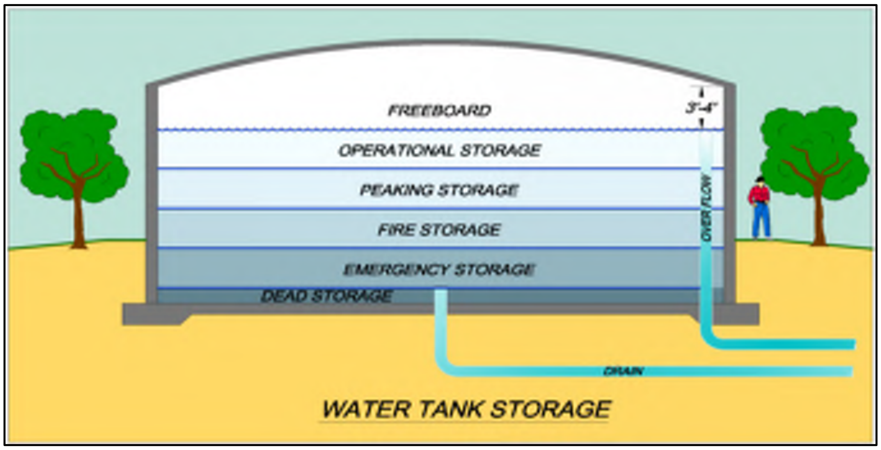


Figure 3-14 Water Reservoir Storage Components

3.6.2 Storage Analysis

The system storage tank consists of a single 242,000-gallon partially buried concrete tank constructed in 1992. The tank is located on E 800 S, approximately one mile outside of city limits, and measures 53 feet wide, 16 feet deep, and has a floor elevation of 4923 feet above sea level. The tank is connected to the distribution system via a shared inlet/outlet and 12-inch transmission line. Water is supplied to the tank from the two pump houses via the distribution system and the 12-inch.

A 2016 inspection of the concrete storage tank concluded that the structure remained in good working condition. The roof, columns, and walls remained in good overall condition with only minor corrosion occurring on the walls at the form ties. The common inlet/outlet had significant corrosion in the form of concentration cells, and should be evaluated during the next inspection. The overflow had signs of uniform surface corrosion (Liquid Engineering Corporation, 2016). Due to sediment on the floor, the condition of the floor could not be evaluated. The EPA and AWWA recommend having tanks inspected every 3 years.

Table 3-8 shows the minimum recommended storage volume for the City's water system based on the above storage criteria.

Table 3-8 Existing Recommended Storage Volumes

Storage Component		Minimum Recommended (gallons)	Comments
Operational Storage		36,305	Use 10-15% to keep water in tank from stagnating
Total Storage (gal)	242,034		
% of Total	15%		
Peaking/Equalization Storage		99,806	Equalization Storage equation recommended by DEQ
$(Q_{PHD} - Q_{max})$ x 150 min			
Fire Storage		277,917	MDD + FF – Firm Capacity
Fire Flow Requirement (gpm)	2,000		
Duration (hrs.)	2		
Emergency Standby Storage		39,484	System has no standby generator
ADD (gpm)	82		
Duration (hrs.)	8		
Total		**453,512**	**Current reservoir has a deficit of 211,500 gallons**

This analysis suggests that with only Well #1 and Well #2 supplying water to the system, there is not sufficient storage.

Figure 3-15 – Albion Water Tank

3.6.3 Standby Storage

IDAPA 58.01.08.501.07 states that sufficient on-site standby power or standby storage need to be available during a power outage. It is required to keep the water distribution system pressurized for a minimum of eight (8) hours at average day demand and fire flow must be able to be provided.

After evaluating each alternative, it has been determined that no generators are needed. Currently, the City of Albion needs two new wells to meet fire flow. With two new wells added to the system and the current population of 310 people, there is enough Standby and Fire Flow Storage for the event of a power outage. In the future, for Alternative 1A, an additional third well is added into the system but the same storage remains. When using a new projected population of 524 people the fire and standby storage is still sufficient to provide enough water for the distribution system. For Alternatives 1B and 1C, only two new wells are constructed but an additional storage tank is added to the system. Having the extra storage from the new tank will ensure that the distribution system will stay pressurized during a power outage. Therefore, no generators are needed because enough standby storage is available to provide enough clean water during a power outage assuming a projected future 2041 population of 524 people.

3.7 SYSTEM OPERATION

The source water is pumped from Wells #1 and #2 directly into the distribution system. The distribution system is connected to a single 12-inch shared inlet/outlet transmission line connected to the concrete water tank on the west side of town. The two pumps alternate in Lead/Lag configuration, with the Lead pump turning on and off based on water level in the tank. If the water level in the tank continues to drop to a certain set point after the Pump On level is reached, the Lag pump turns on. In 2021 during the writing of this report, the **Pump On** and **Pump Off** setpoints were 14 ft and 16 ft, respectively.

The water system is monitored and controlled via a Supervisory Control and Data Aquisitino (SCADA) system with an on-site server and control panel located at the City's utility shop. The

SCADA software is InduSoft Web Studio v7.1 (now owned by AVEVA™). The control panel has a PLC with an Omron HMI with status indicators and setpoints. A Sensaphone 400 Autodialer sends alarms to the Operator via text or phone. The Operator has remote access to the SCADA system via TeamViewer software installed on a tablet.

Communications between sites occurs via a dedicated fiber optic line owned and managed by Albion Telephone Company. Until recently, the Operators have been getting frequent nuisance alarm notifications due to brief power outages, but this has improved with the recent installation of Uninterruptible Power Supplies (UPS) at the wells, tank, and SCADA server.

3.8 SYSTEM CLASSIFICATION, STAFFING, & OPERATOR LICENSURE

Idaho DEQ classifies drinking water systems on two levels: treatment and distribution. The complexity of each system is evaluated individually. Classification worksheets can be found on Idaho DEQ's website (Idaho Dept. of Environmental Quality, 2021). The distribution system is evaluated based on the population served by the system. The breakdown of distribution classification by population is shown in Table 3-9.

Table 3-9 Idaho DEQ Distribution System Classification

Classification	Population
Very Small Water System (VSWS)	* See definition below
Distribution Class I (DWD1)	1,500 or less
Distribution Class II (DWD2)	1,501 to 15,000
Distribution Class III (DWD3)	15,001 to 50,000
Distribution Class IV (DWD4)	50,001 and greater

* **Very Small Public Drinking Water System –** A Community or Non-transient Non-community Public Water System that serves five hundred (500) persons or less and has no treatment other than disinfection** or has only treatment which does not require any chemical treatment, process adjustment, backwashing or media regeneration by an operator (e.g. calcium carbonate filters, granular activated carbon filters, cartridge filters, ion exchangers.) (IDAPA 58.01.08.003.150)

** **Disinfection –** Introduction of chlorine or other agent or process approved by the Department of Environmental Quality, in sufficient concentration and for the time required to kill or inactivate pathogenic and indicator organisms. (IDAPA 58.01.08.003.32)

The treatment system classification is based on the following eight criteria:

- System Size
- Water Supply Source
- Average Raw Water Quality
- Treatment Process
- Disinfection
- Sludge / Backwash Water Disposal
- Bacteriological / Biological Laboratory Control
- Chemical / Physical Laboratory Control

Albion's public water system is classified as a "Very Small Water System", and has distribution operator licensure requirement of VSWS, and has no treatment licensure requirement. The current water system Operator (Colt Giles) is licensed to DWD2, which is above that required for VSWS.

3.9 SANITARY SURVEY

A sanitary survey is typically conducted by DEQ every three to five years for public water systems. As stated on DEQ's website (Idaho Dept. of Environmental Quality, 2021):

> 'A sanitary survey is onsite review of a public water system's water source, facilities, equipment, operation, and maintenance. The purpose of a sanitary survey is to evaluate and document the capabilities of a water system's sources, treatment, storage, distribution system, operation and maintenance, and overall management and financial capacity to continually provide safe drinking water and to identify any deficiencies that might adversely impact a public water system's ability to provide a safe, reliable water supply. The survey also seeks to identify systems that need technical or capacity development.'

Items identified on the sanitary survey are based on the state Rules for Public Drinking Water Systems (IDAPA 58.01.08). The three classifications given for issues identified are as follows:

- A **Significant Deficiency** is defined in IDAPA 58.01.08.003.131 as follows: "As identified during a sanitary survey, any defect in a system's design, operation, maintenance, or administration, as well as any failure or malfunction of any system component, that the Department determines to cause, or have the potential to cause, risk to health and safety, or that could affect the reliable delivery of safe drinking water."

- A **Deficiency** is defined as follows: "As identified during a sanitary survey, the systems design, operation, maintenance, or administration, as well as any failure or malfunction of any system component, that the Department determines are not in compliance with the drinking water rules and do not cause or do not have the potential to cause, risk to health or safety, or that could not affect the reliable delivery of safe drinking water."

- **Recommendations** are items to consider improving the overall operation of the water system.

The most recent sanitary survey for the Albion water system was conducted on September 20, 2021. A copy of the sanitary survey is included in Appendix D. The below *Significant Deficiencies*, *Deficiencies*, and *Recommendations* were identified in the survey. Additional *Significant Deficiencies* identified in the survey that were since addressed by the City are not included.

Significant Deficiencies:

1. **Groundwater Source**
   The pump house for Well #2 is not protected from contamination and/or clean and/or in good repair (IDAPA 58.01.08.541.01.g). The roof structure does not meet current IDAPA standards.

   Response: The City plans to replace the roof and rehabilitate the walls in the near future.

Deficiencies:

2. **Groundwater Source**
   The well casing for Well #1 does not extend above the flood level as required by (IDAPA 58.01.08.511.06.a). The casing is located within a pump house however corrective action will be required during the next material modification.

3. **Distribution**
   The owner/operator did not provide the required notifications or conduct the required follow-up actions after the distribution system depressurized. Any time the distribution system drops below 20 psi, the public water system owner/operator must notify the Department, provide public notice to affected customers within 24 hours, and disinfect or flush the system as appropriate (IDAPA 58.01.08.552.01.b.ii).

4. **Financial**
   The system owner does not have a current written sample siting plan the meets RTCR requirements (40 CFR 141.853.4).

   The system owner does not have a current written sample plan that meets Lead/Copper requirements (40 CFR 141.86).

   The system owner does not have a current written sample siting plan that meets Disinfection Byproducts requirements (40 CFR 141.622).

   RTCR monitoring samples are not being taken in accordance with the approved sample siting plan (40 CFR 141.853.a).

   Lead/Copper monitoring samples are not being taken in accordance with the approved sample siting plan (40 CFR 141.86).

   Disinfection byproduct monitoring samples are not being taken in accordance with the approved sample siting plan (40 CFR 141.622).

5. **Managerial**
   There is not a complete operation and maintenance (O&M) manual for this public water system (IDAPA 58.01.08.501.12,003.90, and 003.91).

   Inadequately protected electrical wiring may be producing a safety concern. All electrical control systems and wiring must conform to the requirements of the National Electrical Code or relevant state/local codes (IDAPA 58.01.08.501.06).

6. **Treatment Application**
   Vents from feeders and/or storage facilities and/or equipment exhaust do not discharge to the outside atmosphere above grade and remote from air intakes (IDAPA 58.01.08.531.02.m).

   There is no means to contain bulk liquid chemical container leaks and/or spills (IDAPA 58.01.08.531.02.j.viii).

Personal protective equipment is not provided for each operator including at least one pair of rubber gloves, a dust respirator of a type certified by NIOSH for toxic dusts, an apron or other protective clothing and goggles or face mask as required by the reviewing authority (IDAPA 58.01.08.531.05.c.i).

A working deluge shower and/or eyewash device is not provided where string acids and alkalis are used or stored (IDAPA 58.01.08.531.05.c.ii).

7. **Chlorination**
   Chlorine storage tanks are uncovered and/or not sealed and/or not vented to the outside atmosphere (IDAPA 58.01.08.531.02.j).

Recommendations:

1. **Groundwater Source**
   Well #X (unspecified in the report) should be protected from unauthorized access through fencing around the source and/or use of a locking well cap.

2. **Distribution**
   Maps of the distribution system should be made available showing main sizes and locations of valves, hydrants, storage tank locations, and interconnections to other systems.

   All valves should be inspected and exercised at least semiannually.

   A water loss control program should be put in place and utilized.

3. **Financial**
   An independent financial audit of the public water system should be completed every year for large systems and every 3 to 5 years for small systems.

4. **Managerial**
   A customer complaint system and ongoing public information program should be provided and maintained.

5. **Treatment Application**
   Space should be provided for convenient and efficient storage and handling of chemicals.

   Floor surfaces of the treatment facility should be smooth, impervious, slip-proof, and well drained for the protection and safety of maintenance personnel and visitors.

6. **Chlorination**
   The free chlorine residual should be measured daily at the entry point to the distribution system.

3.10 RATE STRUCTURE, REVENUE, AND EXPENSES

The City of Albion uses a tiered monthly water rate structure with a flat rate of $33.00 for the first 150,000 gallons, and $1.00 per 1,000 gallons in excess of 150,000 gallons. Residential and

Commercial users are billed this same rate. Connection fees for new water services are $1,500 for a standard connection.

The City's current water rate structure was created by City staff taking into account factors including annual water system expenses and average demands. A summary of the revenue and expenses for fiscal years FY19 and FY20 are shown in Table 3-10 below. A complete list of the expenses for years 2019 and 2020 is included in Appendix F. The expenses exceeded the revenue in FY19 due to the inclusion of depreciation expense. However, if the depreciation expense is left out of the calculation, the revenue closely matched the expenses. This is the case for FY20. Therefore, it appears that the rates accurately reflect the cost of providing water service on an annual basis. However, the rate does not take into account the need for replacement of short-lived assets (SLA) or capital improvements. Therefore, it is recommended that the City consider increasing rates so they have the necessary funds set aside for replacement of infrastructure as the needs arise. Table 3-11 lists the existing SLA's for the water system and the calculated monthly user rate to cover these costs.

Table 3-10 Water Utility Revenue & Expenses

	FY19	FY20
Revenue	$56,392.15	$64,707.48
Expenses*	$65,237.28	$63,558.11
Net Income	$(8,845.13)	$1,149.37

*These values for expenses do not include Depreciation.

Table 3-11 Existing Short-Lived Assets

Item	Service Life (yrs)	Qty	Replacement Cost (2020)	Total Cost	Inflation per Year	Annualized Replacement Cost
30 HP Pump/Motor	15	1	$15,000	$15,000	2.5%	$1,448
40 HP Pump/Motor	15	1	$18,000	$18,000	2.5%	$1,738
Electromagnetic Flow Meter - 4-inch	15	1	$2,600	$2,600	2.5%	$251
Electromagnetic Flow Meter - 6-inch	15	1	$3,900	$3,900	2.5%	$377
Chlorine Diaphram Feed Pump	10	2	$600	$1,200	2.5%	$154
Control Panel Components	15	2	$5,000	$10,000	2.5%	$966
Total Annual Contribution Needs						$4,933
Addt'l User Cost (based on 189 connections) for SLAs ($/mo)						$2.18

3.11 WATER/ENERGY AUDITS

3.11.1 Water

To compare the well production and consumption the bar chart in Figure 3-16 was created. Consumption data was obtained from the City's billing software Black Mountain, and production data was taken from the well meter readings. The results show a significant difference in the volume of water pumped verses the volume of water billed. Note how production vs consumption are fairly close in the winter months (during times of indoor use), yet diverge greatly during the summer months, most likely due to unmetered outdoor use. However, according to City staff the City park on Main St. is the only unmetered connection in the water system. According to the NRCS, grass turf in the summer in Idaho can require as much as 1-inch of irrigation water every 4-7 days to stay green and healthy (USDA-NRCS, 2003). Therefore, the City park is expected to require approximately 40,000 gallons every 4-7 days in the summer (64,000 ft2 x 1-inch), or an approximate volume of 300,000 gallons per month. Note however that the difference between production and consumption exceeds 2,000,000 gallons for multiple months. Possible causes for this difference could be additional unmetered irrigation connections that the City does not know about, flushing of fire hydrants, leaks in the water distribution system, or errors in end-user meter reading or billing.

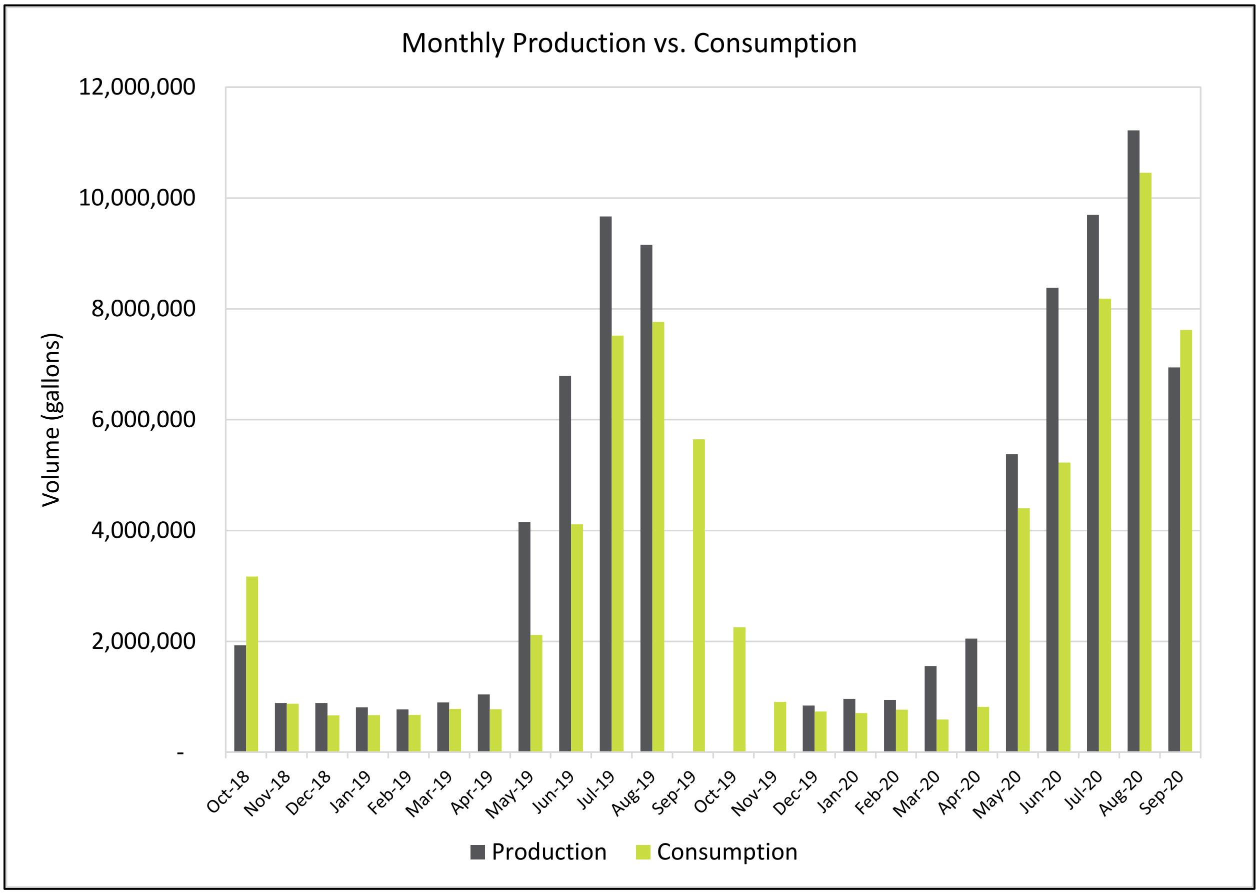


Figure 3-16 Monthly Production vs Consumption

3.11.2 Energy

The City of Albion has not had a thorough energy audit of its water system. It is known that the pump in Well #1 is operating very inefficiently and needs to be replaced, while Well #2 appears to be operating within an acceptable range. Aside from the two well pump motors, the electrical loads consist primarily of well house heating and cooling, and therefore are fairly minimal. During onsite observations conducted as part of this study, it did not appear that the buildings were excessively heated or cooled.

CHAPTER 4 NEED FOR PROJECT

4.1 PUBLIC HEALTH

There are currently no signs of contamination in the water and the City of Albion has not had any reasons for concern in the past. Therefore, the water in Albion is not a threat to the health of the public.

4.2 COMPLIANCE WITH STATE AND FEDERAL REGULATIONS

Several regulatory compliance issues have been identified in the Albion water system. Where current issues violate IDAPA standards, the specific rule violated is listed. These issues, and recommended remedial actions, are summarized below.

4.2.1 Design Basis

IDAPA 58.01.08.501.03 states that water systems, including water source and treatment facilities, shall be designed to provide either peak hour demand of the system or maximum day demand plus equalization storage. The maximum pumping rate of the current system is 520 gpm (748,800 gpd), while 2021 PHD is 1,200 gpm and MDD + Equalization Storage is 846,730 gpd. Therefore, the system fails in both of these ratings, and therefore is inadequate from a design basis. More water sources will need to be developed.

4.2.2 Groundwater Source Redundancy

IDAPA 58.01.08.501.17 states the water system served by groundwater shall provide either PHD or MDD plus Equalization storage with the largest pump out of service. Systems that fail on a design basis also fail with groundwater source redundancy. Therefore, the system fails the groundwater source redundancy requirement, and additional groundwater capacity will need to be developed. Figure 4-1 shows the source redundancy deficiency.

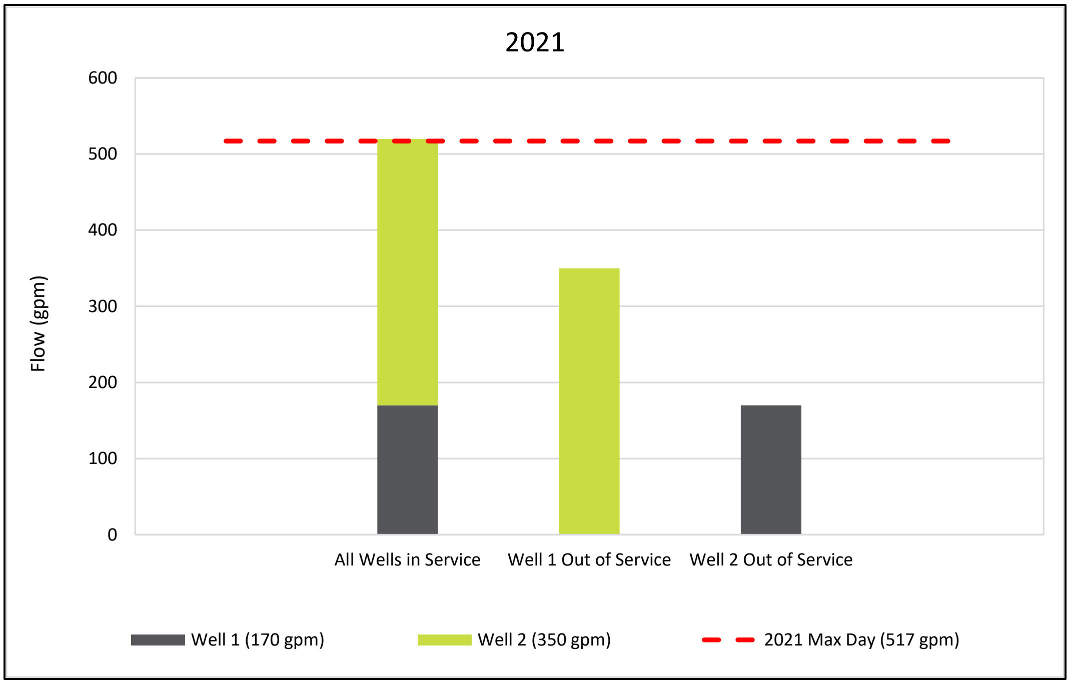


Figure 4-1 Groundwater Source Redundancy Deficiency

4.2.3 Redundant Fire Flow Capacity

IDAPA 58.01.08.501.18.a and IDAPA 58.01.08.501.18.b state that a public water system that provides fire flow shall be able to provide MDD plus Fire Flow with the largest pump out of service. Fire Storage can help meet the fire flow requirement. To meet the redundant fire flow capacity requirement, the system would need 278,000 gallons of fire storage. However, the existing system has only 66,500 gallons of fire storage, and therefore does not meet this requirement. This solution could be fixed with either more storage or more wells, or a combination of the two. Figure 4-2 shows the redundancy fire flow capacity deficiency.

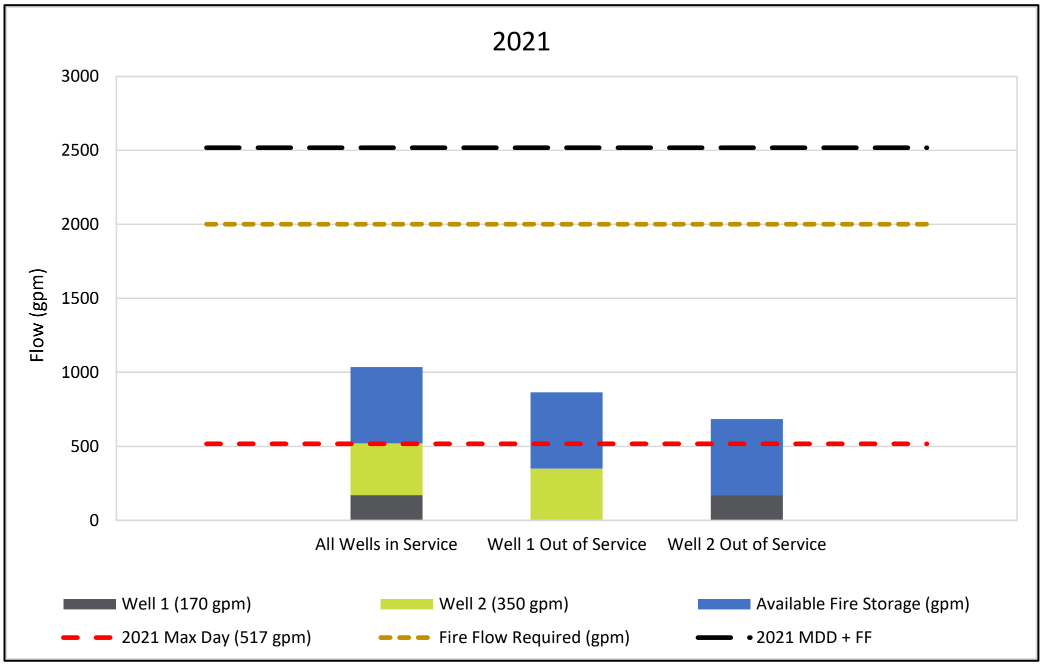


Figure 4-2 Redundant Fire Flow Capacity Deficiency

4.2.4 Fire Flows

Fire flow testing was conducted by Keller Associates in July 2021, which was used to calibrate a hydraulic model to evaluate the system. Testing and modeling results reveal that most of the hydrants tested within the City's water system meet the minimum requirements for fire flow. However, a couple of the hydrants do not meet required fire flows, because they are not looped. The pipes feeding these hydrants should be looped to be able to provide the required fire flows.

4.2.5 Fire Hydrant Connected to less than 6-inch Main

IDAPA 58.01.08.542.06 states that where fire hydrants are provided, they shall not be connected to water mains smaller than six (6) inches in diameter. The hydrant on the south end of town is on a main that is too small and should be upsized.

4.3 AGING INFRASTRUCTURE

The well houses for both Well #1 and Well #2 are in very poor condition and should be replaced. As shown in Figure 4-3, the well house for Well #1 exhibits a cracked wall indicative of a settled foundation (top left), and sunken spots on the roof (bottom left). The inside exhibits significant corrosion of the piping (top right) and well casing (bottom right). The control panel still has live, pressurized copper tubing inside it for old hydraulic controls that have long since been disconnected. It is recommended to replace this entire building, install a protective sleeve around the well casing, and replace the piping and electrical equipment during upgrades to Well #1.

Figure 4-3 Well House #1

The well house for Well #2 is a stick framed building and is showing signs of significant deterioration (see Figure 4-4). The roof and ceiling needs to be replaced (top left and top right), and often leaks on the interior electrical equipment (bottom right). The siding is showing signs of rot, and penetrations through the building envelope were done poorly (bottom left), likely leading to high infiltration and above normal energy consumption. It is recommended to replace this building once Well #1 has been upgraded, and one of the new wells is fully constructed and online.

Figure 4-4 Well House #2

As explained in Section 3.11.1, the distribution system is expected to be in decent condition.

4.4 FUTURE WATER DEMAND

Population projections presented in Section 2.3 have been used to estimate future demand scenarios. The calculations assume the annual average per capita use remains constant at 396 gpcd. Table 4-1 summarizes projected water demands.

Table 4-1 Current and Projected Water Demands for Albion, ID

Metric	2021 Demand	2041 Demand	2061 Demand
Population	310	524	864
EDUs	189	327	539
ADD	0.126 MGD	0.208 MGD	0.342 MGD
MDD	0.700 MGD	1.227 MGD	2.023 MGD
PHD	1.707 MGD	2.762 MGD	4.354 MGD

Idaho DEQ requires that water systems have sufficient redundancy so that minimum quantity, quality, and pressure requirements are met during any period of time with any component out of service. Based on the current demands, the city is unable to meet current redundancy requirements, let alone future redundancy requirements.

CHAPTER 5 ALTERNATIVES CONSIDERED

5.1 DESIGN BASIS AND REDUNDANCY ALTERNATIVES

The alternatives presented in this section address the deficiencies in design basis (IDAPA 58.01.08.501.03), groundwater source redundancy (IDAPA 58.01.08.501.17), and redundant fire flow capacity (IDAPA 58.01.05.501.18). The demands used in the development of the alternatives use the 20-year population projection. For the alternatives that entail the construction of new wells, the assumed maximum well yield of 500 gpm is taken from the 2004 *Well Yield Evaluation and Water Supply Resource Assessment* report (included in Appendix C), which was included in the 2005 Water Facilities Planning Study. Although this report is quite old, the conditions surrounding the aquifer testing and calculations presented therein are not expected to have changed, and therefore the anticipated maximum well yield for the existing wells as well as new wells is still relevant for preliminary planning purposes.

5.1.1 Alternative 1A – Increase Well #1 & Three New Wells

This alternative recommends increasing the capacity of Well #1 from 170 gpm to 395 gpm (the expected maximum well capacity), in addition to drilling three new 500 gpm wells. The first new 500 gpm well will provide enough water to the community for normal operations. The second new 500 gpm well would provide sufficient source redundancy requirements, and the third new 500 gpm well will solve the redundant fire flow capacity requirements. One well would likely be located next to the existing water tank, one well would be next to the City shop, and one well would be located on the south side of town. The actual well capacity and water depths, following drilling and development, would dictate the size of pump required, and the actual quantity of additional wells needed. If the new wells yield less than 500 gpm, more wells may be needed.

The addition of source capacity necessitates the purchase of additional water rights. Currently, the City has 848 gpm of municipal water rights. Assuming Well #1 is increased to 395 gpm, Well #2 continues to operate at 350 gpm, and the one new well yields 500 gpm, whenever Well #1 and the new well operate simultaneously the flow rate will exceed the water right diversion rate allowance by 47 gpm. As the City grows, eventually three pumps will need to run simultaneously, and the total typical pumping capacity will be 1245 gpm, which exceeds the City's maximum water right diversion by 397 gpm. Therefore, approximately 400 gpm of additional water rights are needed. The water rights purchase is included in the Capital Improvements Plan in Chapter 7.

This alternative has very little environmental impact other than the development of the three new well sites, and the impact that pumping those wells would have on other wells in their vicinity.

5.1.2 Alternative 1B – Increase Well #1, Two New Wells, & New 250,000 Gallon Tank

This alternative recommends increasing the capacity of Well #1 from 170 gpm to 395 gpm (the expected maximum well capacity), drilling two new 500 gpm wells, and constructing a new 250,000 gallon storage tank. One well could likely be located next to the existing water tank, and the second well could be next to the City shop. The actual well capacity and water depths, following drilling and development, would dictate the size of pump required, and the actual quantity of additional wells needed. If the new wells yield less than 500 gpm, more wells may be needed.

Technically, only 85,000 gallons of additional storage is necessary to meet the redundant fire flow requirement, but planning for such a small tank is not recommended due to the economy of scale of concrete tank construction. At the required 85,000 gallons, this alternative is estimated to be cheaper than Alternative 1A, and at 150,000 gallons, the two alternatives are estimated to cost the same. However, for preliminary planning purposes, we will assume the new tank will be sized to match the existing tank at approximately 250,000 gallons.

The impact of this alternative on water rights is the same as described in Alternative 1A. This alternative has very little environmental impact other than the development of the three new well sites and storage tank, and the impact that pumping those wells would have on other wells in their vicinity.

5.1.3 Alternative 1C – Increase Well #1, Two New Wells, New 250,000 Gallon Tank, & Secondary Water System

This alternative is identical to Alternative 1B with the addition of a new secondary water system for irrigation. The secondary water system would provide pressurized water to the City residents via a dedicated distribution system, utilizing the City's irrigation water rights during the irrigation season. This would reduce demand on the drinking water system in the summer months when surface water is available. However, according to Albion's Mayor, flows in Marsh Creek (the source of the irrigation supply) often diminish substantially by August, and in years with drought may stop entirely even earlier, making this an unreliable consistent source. In dry years, it is likely that City residents would revert to using the drinking water supply for irrigation, regardless of the cost. Since peak demands often occur in late summer, the secondary water system could not be relied upon to reduce maximum day and peak hour demands, and therefore the drinking water system would still need to the improvements in either Alternative 1A or 1B to meet that demand while maintaining the necessary redundancy, including the purchase of additional water rights. The cost of the secondary water system was adapted from the 2005 Water Facilities Planning Study by adjusting for inflation and adding a safety factor of 15%.

This alternative has more environmental impact than Alternative 1A or 1B due to the addition of the secondary water system, which would necessitate trench excavation and new piping materials all through the service area.

5.1.4 Alternative 1D – No Action

The City of Albion is currently out of compliance with IDAPA regulations. Choosing not to implement one of the above improvements will likely result in the system running out of water if either of the two existing pumps fail. Worst case scenario would be that a fire event occurs while the pump is out of service, and the fire could not be adequately extinguished or contained. Until improvements are implementing, new connections to the water system should be prohibited. This alternative is not considered to be in the City's best interest.

5.2 DISTRIBUTION SYSTEM ALTERNATIVES

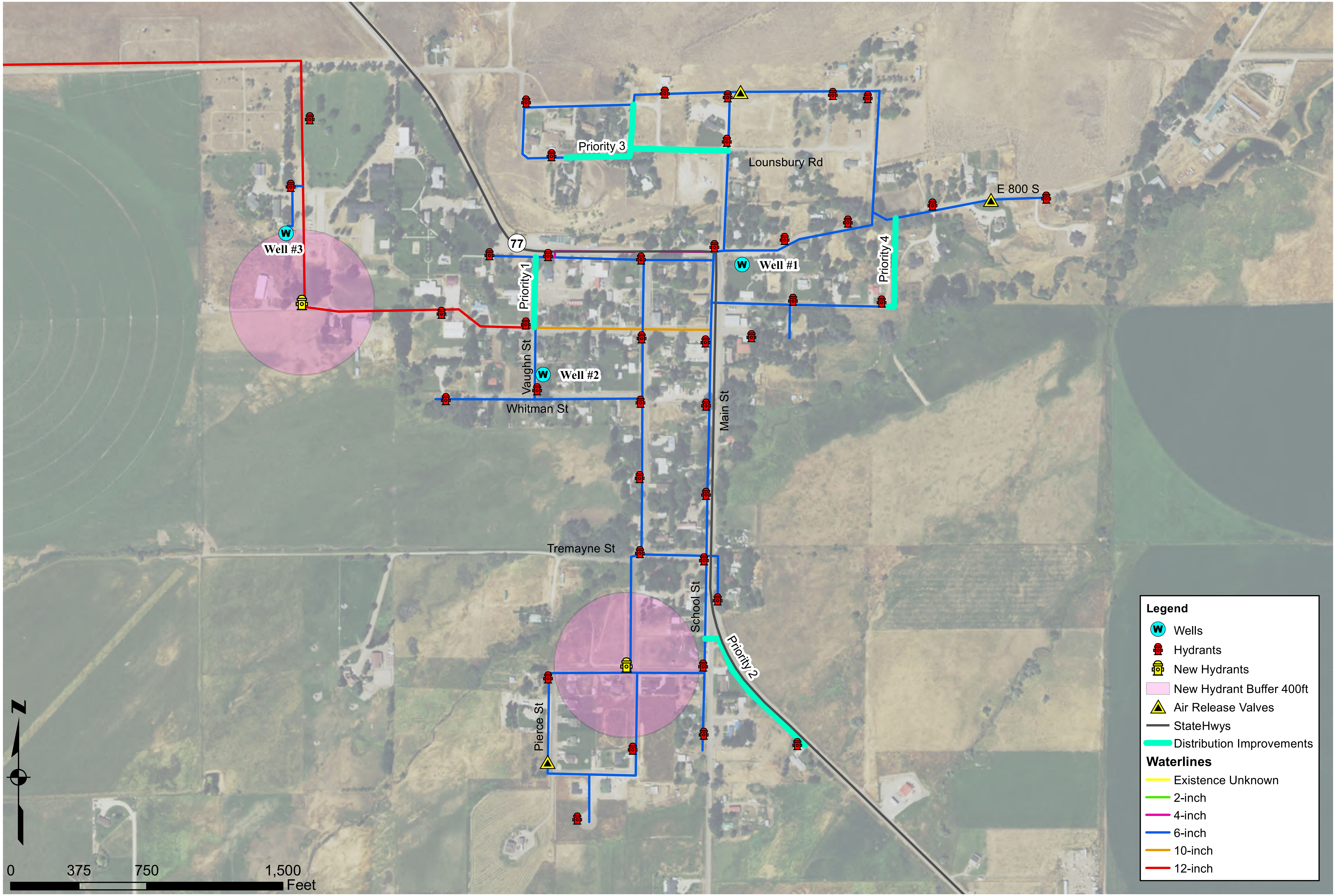
5.2.1 Alternative 2A – Distribution System Improvements

As discussed in Section 3.5.7, only a couple of deficiencies were observed in the distribution system, namely, fire flow deficiencies at three locations in the distribution system, and the need for two additional hydrants. These fire flows can be improved by the installation of 6-inch distribution piping. The three areas are ranked in terms of priority. Priority 2 and 3 may not be necessary if it is discovered that piping already exists in these areas. The location, length, and approximate cost of the recommended improvements are shown in Table 5-1, and a map of the improvements is shown in Figure 5-1. Cost estimates include mobilization, contingency, engineering, and two years of inflation.

Table 5-1 Water Line Improvements

Improvement	Qty	Cost Estimate (2021)
Priority 1 – Vaughn St	390 ft	$79,000
Priority 2 – South Hwy 77	845 ft	$159,000
Priority 3 – Lounsbury Rd	930 ft	$175,000
Priority 4 – E 800 S to South St	518 ft	$100,000
Fire Hydrants	2	$11,000
Total		**$524,000**

*The cost estimate herein is based on our perception of current conditions at the project location. This estimate reflects our opinion of probable costs at this time and is subject to change as the project design matures. Keller Associates has no control over variances in the cost of labor, materials, equipment, services provided by others, contractor's methods of determining prices, competitive bidding or market conditions, practices or bidding strategies. Keller Associates cannot and does not warrant or guarantee that proposals, bids, or actual construction costs will not vary from the cost presented herein.



PROJECT NO. 219121

KELLER ASSOCIATES
305 N. 3rd Avenue
Pocatello, ID 83201
208.238.2146

City of Albion

Water Facilities Planning Study

Distribution System Improvements

FIGURE NO. 5-1

Print Date: 4/5/2022

Document Path: J:\219121 Albion GESI_GIS\MXDs\Distribution Improvements.mxd

5.2.2 Alternative 2B – No Action

If no action is taken to address the distribution system improvements, available fire flows at a select few nodes in the distribution system will be lower than required. At a minimum, these hydrants should have permanent marking to identify them as reduced flow hydrants, and the fire chief and fire department staff should be made aware of them. However, neglecting to improve the fire flows at these hydrants is not recommended due to the inherent safety risk.

5.3 ADDITIONAL IMPROVEMENTS

5.3.1 Alternative 3 – Sanitary Survey Improvements

This alternative entails addressing the deficiencies and recommendations given in the City's 2021 Sanitary Survey, explained in Section 3.9. Repairs to Well #1 include extending the well casing above grade and installation of a protective steel sleeve and grout around the casing where it is exposed in the building basement, installation of a chlorine tank exhaust vent and eye wash station, and purchase of protective equipment for the Operator. Repairs to Well #2 include replacing the roof and repairing the walls, and the installation of a chlorine tank exhaust vent and eye wash station, and purchase of protective equipment for the Operator. Lastly, the alternative includes development of a sample siting plan for RTCR, Lead & Copper, and Disinfection Byproducts, and creation of an operations and maintenance (O&M) manual for the existing well houses.

5.3.2 Alternative 4 – Recommended Improvements

Alternative 4 includes the following recommended improvements. These are not required, but are recommended to address water quality, sanitation, and emergency operation. To address water quality in the tank, a mechanical GridBee mixer, or similar technology, should be installed. This will continually mix the contents of the tank to reduce water age and stagnation. Second, a new CMU building for Well #1 is included, as the existing building shows significant signs of deterioration. Third, a portable 50kW generator is purchased by the City, which could be used in the event of a prolonged power outage to power the City's largest well. Last, SCADA improvements are implemented to improve operator experience and prevent nuisance alarms.

5.3.3 Alternative 5 – Meter Replacement & Automated Meter Reading

This final alternative plans for the replacement of residential water meters in the near future. As explained in Section 3.5.2, the existing meters are nearing the end of their service life and will need to be replaced within the next five years or so. The City's monthly user rate does not currently include a fee for meter replacement. This alternative creates a budget for system wide meter replacement, along with the purchase of an automated meter reading (AMR) receiver for drive-by meter readings. Drive-by meter reading is anticipated to save the Operator approximately one day per month, for an approximate annual labor savings of $1,920, assuming an hourly wage of $20/hr.

CHAPTER 6 ALTERNATIVES ANALYSIS

In this chapter, the alternatives presented in Chapter 5 are compared based on estimated project capital cost and lifecycle cost, regulatory compliance, reliability, and public health and safety. The cost estimates provided include capital costs, contractor mobilization, contingency, engineering fees, additional costs such as land acquisition and easement development, and two years of inflation. The cost estimates are based on the perception of current conditions at the project location, and are subject to change as the project design matures. Keller Associates has no control over variances in the cost of labor, materials, equipment, services provided by others, contractor's methods of determining prices, competitive bidding or market conditions, practices, or bidding strategies. Keller Associates cannot and does not warrant or guarantee that proposals, bids, or actual construction costs will not vary from the cost presented herein.

A thorough lifecycle cost analysis considers the entire costs of an alternative over the planning period of concern, taking into account a discount factor, construction and non-construction costs, annual O&M costs, replacement of short-lived assets (SLA), and salvage values. The proper approach converts all future costs to their present worth for the purpose of comparing alternatives in present day dollars. Annual O&M costs are converted to their present worth with the uniform series present worth equation:

$$\frac{P}{A} = \frac{(1+i)^n - 1}{i(1+i)^n} \tag{2}$$

and future costs are converted to present worth with the equation:

$$\frac{P}{F} = \frac{1}{(1+i)^n} \tag{3}$$

The net present value (NPV) of the alternative is calculated with equation 9:

$$NPV = C + O\&M\left(\frac{P}{A}, \%, years\right) + R\left(\frac{P}{A}, \%, years\right) - S\left(\frac{P}{A}, \%, years\right) \tag{4}$$

where

O&M = annual operations and maintenance costs
R = replacement cost of short-lived assets
S = salvage value of short-lived assets

The analysis for each alternative is calculated with the above method using a planning period of 30 years and a real discount rate of 3%.

6.1 COMPARISON OF DESIGN BASIS AND REDUNDANCY ALTERNATIVES

6.1.1 Lifecycle Costs

Table 6-1 shows the capital costs, annual O&M and SLA replacement costs for year 2021, 20-year lifecycle costs of the design basis and redundancy alternatives. To develop the lifecycle costs, the annual O&M and SLA costs were converted to a present value using a discount rate of -0.5% based on the real interest rate for a 20-year bond published by the US Office of Management and Budget (OMB) in the OMB Circular published December 21, 2020 (US Office of Management & Budget, 2020). The alternative with the highest capital cost also has the highest lifecycle cost (Alternative 1C), and the alternative with the lowest capital cost also has the lowest lifecycle cost (Alternative 1A).

Table 6-1 Alternative 1 Lifecycle Costs

Cost Description	1A – Increase Well #1 & Three New Wells	1B – Increase Well #1, Two New Wells, & New 250,000 Gal Tank	1C – Increase Well #1, Two New Wells, New 250,000 Gal Tank, & Secondary Water System
Estimated Capital Cost	$2,838,000	$3,253,000	$4,686,000
Estimated Increase in Annual O&M*	$1,440	$1,868	$2,868
Estimated Increase in Annual SLA*	$9,480	$7,617	$12,916
20-year Lifecycle Cost	$2,973,542	$3,373,834	$4,881,427

*Cost listed is for 2021.

6.1.2 Non-Monetary Costs

The various non-monetary factors needing consideration in this analysis are included below.

Environmental Impacts/Land Requirements

The primary environmental impact of alternatives 1A, 1B, and 1C would be the localized impact of the new wells to the aquifer. During pumping, existing wells in the vicinity of the new wells may be within the new well's cone of depression, and thereby may experience reduced pumping rates. However, the none of these alternatives entail additional water consumption besides that caused by ordinary growth, and so the total impact to the aquifer is not anticipated to change from one alternative to the other.

Land will be required for each well site and the tank. The difference in land required between the alternatives is not substantial, with the exception of Alternative 1C, which would require an equalization pond and pump station. The land disturbed during construction of the secondary water system would be within existing right of ways and would not have a permanent impact.

Potential Construction Problems

The primary potential construction problem with all the above alternatives is well yield of the new wells. The 500 gpm anticipated well yield is an estimate based on aquifer testing, but is not guaranteed and may differ from well to well due to localized geology. The secondary construction concern will be in land acquisition and easements, which may limit the available sites for the new wells and/or tank.

Sustainability – Water and Energy Efficiency

None of the above alternatives have substantially more impact on the overall sustainability of the water system than the others. To minimize electrical energy consumption, the new buildings for the well houses may be constructed using foam filled CMU blocks to increase the energy efficiency over an ordinary CMU building, and lights will be LEDs operated by occupancy and vacancy sensors. Alternative 1B and 1C have a water tank that may need continuous power for mixing if a passive mixing technology is not chosen. Alternative 1C would reduce demand on the aquifer by utilizing the surface water resource for irrigation, which could be beneficial if the aquifer shows signs of depletion now or into the future. However, Alternative 1C uses substantially more materials in construction than Alternative 1A and 1B.

Green Infrastructure
It is unlikely that the new facilities will be designed in a way that qualifies them as green infrastructure.

Social Factors
Alternatives 1A and 1B are not anticipated to have any social impact. Alternative 1C would require a change in behavior of residents to switch their irrigation systems over to a secondary water source.

6.2 COMPARISON OF DISTRIBUTION SYSTEM ALTERNATIVES

The estimated total capital cost of distribution system Alternative 2A is $524,000. There are no O&M or SLA costs associated with piping improvements of this nature, so the lifecycle cost is the same as the capital cost.

The recommended pipe replacements in the distribution system alternatives are important for delivering fire flow to the selected hydrants. The “no action” alternative will result in failure to meet fire flows, and inherent risk in failing to meet fire flows as a result. The City will have to decide which of these hydrants are important enough to warrant the cost of the pipe replacement. There is no lifecycle cost or other considerations worth comparing with these alternatives.

6.3 COMPARISON OF ADDITIONAL IMPROVEMENTS

Alternative 3 – Sanitary Survey Improvements is necessary to meet minimum DEQ requirements for sanitation and proper sampling. Due to the types of improvements needed, there will be no increase to the system O&M or SLA costs. There are no additional impacts (environmental, sustainability, green infrastructure, or social) to the system. The estimated total capital cost of Alternative 3 is $151,000.

Alternative 4 – Recommended Improvements is highly recommended, and will address water quality with the tank mixer, structural soundness of the system with the replaced well house for Well #1, vulnerability with the portable standby generator, and operability with the SCADA improvements. There are no negative environmental impacts or land requirements for this alternative. The sustainability may be increased by the improved well house, although the tank mixer may require additional electrical energy. This alternative has a positive social impact, as the tank mixer will increase water quality, and the portable generator will reduce the system’s vulnerability to a prolonged power outage. The estimated total capital cost of Alternative 4 is $215,000.

Alternative 5 – Meter Replacement & AMR is optional at this point in time and was included in case the City wished to replace all the meters and improve their meter reading technology in one single effort. This measure will increase the sustainability of the water system by reducing routine manual labor required for reading water meters. The estimated total capital cost of Alternative 5 is $111,000.

6.4 PUBLIC PARTICIPATION

Community engagement in the project planning process is critical to its success. The purpose of a water utility is to serve the needs of the community. As such, involvement of the community in the planning process can help develop public understanding of the need for the project, funding requirements, and revenue strategies.

A public meeting was held on January 11, 2022, in which the need for the project was explained to the City Council and the public, along with a presentation of the alternatives considered and recommended alternative. Included in the presentation was the estimated impact to user rates, environmental impacts, and mitigation measures specific to each alternative. The presentation materials and notification information are provided in Appendix G.

A 14-day public comment period was held following the public meeting. A copy of the planning study was made available for review at City Hall and public comments were encouraged. An Open house was held at the City Civil Center on March 1, 2022. No public comments were received. If the City decides to move forward with improvements, a bond election or judicial confirmation will be necessary for the City to enter into a loan agreement and secure funding.

CHAPTER 7 PREFERRED ALTERNATIVES

7.1 PREFERRED ALTERNATIVES

Albion selected the following alternatives for improvements to their system. These decisions were made following public participation requirements as discussed in Section 6.4. No change in operator licensing will be required with the implementation of the selected improvements.

7.1.1 Preferred Design Basis and Redundancy Alternative

The preferred alternative to address the design basis and redundancy deficiency was *Alternative 1B – Increase Well #1, Two New Wells, & New 250,000 Gallon Tank*. This alternative strikes a balance between additional wells and additional storage, and is the City's preferred option because the additional storage will give them some water volume in reserve in the event of a power outage.

7.1.2 Preferred Distribution System Improvements

The only distribution system improvement alternative is Alternative 2A, which entails installing a up to four new waterlines to improve fire flows and installing two additional fire hydrants to complete fire hydrant coverage within the City. The City's interest in pursuing this alternative will depend on available funding and grants.

7.2 CAPITAL IMPROVEMENT PLAN

A capital improvement plan (CIP) has been developed for the City of Albion (see Table 7-1). The CIP outlines a prioritization schedule and provides an opinion of probable cost for those improvements. The prioritization schedule is based on an evaluation of the water system needs with respect to regulations, reliability, and current and future population.

The CIP summary is grouped by priority. Priority 1 improvements are intended to address immediate needs of the water system, while Priority 2 improvements are optional at the present point in time.

Table 7-1 Capital Improvement Plan

ID#	Item	Cost*
Priority 1 Improvements		
1B	Increase Well #1, Two New Wells, & New 250,000 Gallon Tank	$3,253,000
2A	Distribution System Improvements	$524,000
3	Sanitary Survey Improvements	$151,000
4	Recommended Improvements	$215,000
-	Water Rights Purchase*	$1,500,000
	Total Priority 1 Improvements	***$5,643,000***
Priority 2 Improvements		
5	Meter Replacement & AMR	$111,000
	Total Priority 2 Improvements	***$111,000***
	TOTAL WATER SYSTEM PRIORITY IMPROVEMENTS	***$5,754,000***

*Estimate. Actual cost will vary based on local/regional water rights market conditions.

7.3 FUNDING ANALYSIS

Funding for the implementation of the system improvements may come from several sources. The primary source of funds for the recommended system improvements may come from low interest loans through Idaho DEQ's State Revolving Fund (SRF) loan program and USDA-Rural Development. Remaining monies may come from other sources that the community may be eligible for. These include grants from the Army Corps of Engineers, Idaho Department of Commerce [Community Development Block Grant Program (CDBG)], Special Congressional Appropriations, Bureau of Reclamation, and Homeland Security Grant Programs.

Idaho DEQ – The selection process for water and wastewater project funding is competitive. To be eligible for and receive funding from Idaho DEQ-SRF, a letter of interest and application must be submitted for the fiscal year. Idaho DEQ ranks all of the submitted applications and awards funds accordingly. In addition to the loan, Idaho DEQ may offer some principle subsidy (grant) money.

USDA-Rural Development – In order for the community to be competitive for USDA-Rural Development funds the minimum monthly water user rate must be approximately $50.00. In addition to user rates, water systems must have water meters on all service connections or be installing water meters in the proposed project to be eligible for USDA-RD monies. Rural Development grant funds are awarded based on need as measured by a community's median household income (MHI). The MHI is determined by the most recent census data. According to the Area Specialist in USDA-RD's Central Idaho Area Office, Albion would likely be eligible for a 30% grant and 70% loan at a 40-year maximum duration and interest rate of 2%.

U.S. Army Corps of Engineers – Albion could also apply for up to a 75% reimbursement through the U.S. Army Corps of Engineers (ACOE) through their Section 595 Program for Rural Idaho. ACOE provides this opportunity to projects owned by public entities. Assistance can be for design-only, design and construction, or construction-only projects.

Idaho Department of Commerce Community Development Block Grant – To be eligible for CDBG funds, the community must have a "Low-to-Moderate Income" (LMI) of 51% or higher. According to the Idaho Department of Commerce website, which uses American Community Survey data, Albion has an LMI of 35.3%. However, due to the City's opinion that there was a discrepancy in this data, in 2019 the City decided to conduct a door to door Income Survey with the help of Region IV Development, which resulted in a LMI determination of 51.18%. Therefore, the City may be eligible for a CDBG grant. The summary page from the Income Survey is included in Appendix A.

Private Funding – Private project funding options for Albion include the Idaho Bond Bank Authority (IBBA). Financing through the IBBA is available to public entities in Idaho. The Bond Bank typically pools loans from multiple participants, offers Federal and State Tax Exempt status, and pledges statewide sales tax revenues as security to bond holders – with a combined result in competitive bonds for Idaho communities. The program is typically used to finance water and wastewater projects with a variety of terms and financing strategies. Use of the funding does not trigger Davis Bacon or other federal requirements associated with subsidized loans/grants (i.e. Idaho DEQ-SRF, USDA-RD). Once the bonds are sold, the full amount of funding is immediately available to the municipality and the repayment obligation begins. Terms can be up to 30 years and interest rates typically vary from 2-5%.

Special Congressional Appropriations and Homeland Security Grants vary in amount and are difficult to predict but could be viable funding options to reduce the loan burden for the City. However, because the funding is highly variable, project eligibility and funding amounts are difficult to predict.

7.4 AUTHORITY TO INCUR DEBT

To incur indebtedness, the City must either pass a bond election or go through the 'Ordinary and Necessary' Judicial Confirmation process. Bond elections can only be held twice per year, once in May and once in November. The Judicial Confirmation process requires a hearing with a judge who will review the needs, proposed solution, and impacts to the City and makes a ruling on whether or not the project is deemed ordinary and necessary. Some funding sources require that a bond election be passed rather than the Judicial Confirmation process.

7.5 RATE ANALYSIS

Table 7-2 and Table 7-3 show the line items used in estimates of user rate increases with two potential funding scenarios for the City (Idaho DEQ and USDA-RD), which include the increase in short-lived assets and O&M that would result from the alternative, annual loan repayments, and 10% annual debt service reserve. These rates are approximate and contingent on final project size, interest rates, and available funding packages. Funding package scenarios are typical of recent years though with the current ARPA funding being allocated, actual funding scenarios may be much more favorable to the City.

Table 7-2 DEQ Funding Scenario, 2% Principal Forgiveness, 1.75% @ 30 years

Item	Alternative				
	Alt 1B	Alt 2A	Alt 3	Alt 4	Alt 5
Interest Rate	1.75%				
Loan Term	30				
EDUs	189				
Total Project Cost	$3,253,000	$524,000	$151,000	$215,000	$111,000
DEQ Loan Forgiveness 2%	$65,060	$10,480	$3,020	$4,300	$2,220
Loan Amount	$3,187,940	$513,520	$147,980	$210,700	$108,780
Annual Loan Payment	$137,495	$22,148	$6,382	$9,087	$4,692
Debt Service Reserve (10%)	$13,750	$2,215	$638	$909	$469
O&M	$75,946	$74,078	$74,078	$74,979	$72,158
SLA Reserve	$12,550	$4,933	$4,933	$6,004	$5,126
Total Annual Cost	$239,741	$103,374	$86,032	$90,979	$82,445
Current Base User Rate	$33.00				
Estimated Monthly Rate Increase per Connection	$72.71	$12.58	$4.93	$7.11	$3.35
New Monthly User Rate	$105.71	$45.58	$37.93	$40.11	$36.35

*The cost estimate herein is based on our perception of current conditions at the project location. This estimate reflects our opinion of probable costs at this time and is subject to change as the project design matures. Keller Associates has no control over variances in the cost of labor, materials, equipment, services provided by others, contractor's methods of determining prices, competitive bidding or market conditions, practices or bidding strategies. Keller Associates cannot and does not warrant or guarantee that proposals, bids, or actual construction costs will not vary from the cost presented herein.

Table 7-3 USDA-RD Funding Scenario, 30% Grant, 2.00% @ 40 years

Item	Alternative				
	Alt 1B	**Alt 2A**	**Alt 3**	**Alt 4**	**Alt 5**
Interest Rate	2.00%				
Loan Term	40				
EDUs (2021)	189				
Total Project Cost	$3,253,000	$524,000	$151,000	$215,000	$111,000
30% Grant	$975,900	$157,200	$45,300	$64,500	$33,300
Loan Amount	$2,277,100	$366,800	$105,700	$150,500	$77,700
Annual Loan Payment	$83,241	$13,409	$3,864	$5,502	$2,840
Debt Service Reserve (10%)	$8,324	$1,341	$386	$550	$284
O&M	$75,946	$74,078	$74,078	$74,979	$72,158
SLA Reserve	$12,550	$4,933	$4,933	$6,004	$5,126
Total Annual Cost	$180,061	$93,761	$83,261	$87,035	$80,409
Current Base User Rate	$33.00				
Estimated Monthly Rate Increase per Connection	$46.39	$8.34	$3.71	$5.38	$2.45
New Monthly User Rate	$79.39	$41.34	$36.71	$38.38	$35.45

*The cost estimate herein is based on our perception of current conditions at the project location. This estimate reflects our opinion of probable costs at this time and is subject to change as the project design matures. Keller Associates has no control over variances in the cost of labor, materials, equipment, services provided by others, contractor's methods of determining prices, competitive bidding or market conditions, practices or bidding strategies. Keller Associates cannot and does not warrant or guarantee that proposals, bids, or actual construction costs will not vary from the cost presented herein.

Table 7-4 provides a summary of the increase in user rate of all alternatives. The second to last column shows the total increase necessary to implement all of the alternatives as well as to purchase the water right. The final column shows the new rate the City would need to charge if all of the alternatives were implemented, which includes the existing $33/month base rate.

Table 7-4 Increase in Monthly User Rate

Funding Scenario	Alt 1B	Alt 2A	Alt 3	Alt 4	Water Rights	Alt 5	Total Increase*	New Rate*
USDA-RD 30% Grant 40-yr @ 2.00%	$46.39	$8.34	$3.71	$5.38	--	$2.45	$100.59	$133.59
DEQ 2% Grant 30-yr @ 1.75%	$72.71	$12.58	$4.93	$7.11	--	$3.35	$135.10	$168.10
Idaho Bond Bank 30-yr @ 2.00%	--	--	--	--	$34.32	--	--	--

*Includes the increase of all alternatives, plus the increase due to the purchase of the additional water right.

In addition to raising user rates, it is recommended that the connection fee be increased 2-3% per year to keep up with inflationary changes. Connection fees should be added to a capital improvements fund to be used for future improvement projects.

7.6 PROJECT SCHEDULE

Implementation of most of Alternative 1B and Alternative 3 needs to begin as soon as possible to bring the water system into compliance with DEQ regulations. Ideally, Alternative 4 should happen during the same phase of upgrades as Alternative 1B, which would keep the costs lower than if that is done as its own phase of improvements. Implementation of Alternative 2A will depend on the City's interest in improving the distribution system. The decision to move forward with Alternative 2A will likely depend on the amount of funding and associated terms received by the City.

Table 7-5 shows the components of Alternative 1B and when they need to be implemented, based on the population, number of connections to the water system (or EDUs), and approximate year that the population is expected to occur based on the population projection. Note that construction costs will likely be minimized if Alternative 1B is implemented as a single large project, as opposed to separate individual projects.

Table 7-5 Phasing of Alternative 1B

Scenario	Pop.	No. of Connections	Year	Design Basis	Source Redundancy	Redundant Fire Flow	Water Rights
Scenario A	326	194	2022	Increase Well #1	1st New Well	2nd New Well	Purchase 400 gpm WR
	360	215	2026	✓	✓	New 250,000 Tank	✓
Scenario B	326	194	2022	Increase Well #1	1st New Well	New 250,000 Tank	Purchase 400 gpm WR
	440	267	2034	✓	2nd New Well	✓	✓

*check mark means this design requirement is met.

Whether or not additional water rights will need to be purchased immediately will depend on the actual yields obtained from increasing the capacity of Well #1 and drilling the first new well. If the City wishes to postpone the water right investment, they should recalculate the need for the new water right after these two components of Alternative 1B are completed.

Developing a schedule to implement system improvements provides a timeline that will help motivate project development, identification of funding sources, education of the general public, and establish deadlines for major project milestones. Prior to proceeding with the implementation of this study and the identified projects, an Environmental Information Document (EID) would need to be completed and approved by Idaho DEQ depending on the area that would be disturbed by the project. The EID is only viable for 5 years so it is prudent to only include those items that will be started within the five-year window after the EID is completed. A preliminary project schedule is presented in Table 7-6.

Table 7-6 Preliminary Project Schedule

Event	Date
Bond Election or Judicial Confirmation	Nov 2022
Obtain Funding	Jan 2023
Complete Environmental Information Document	Mar 2023
Begin Design of Improvements	Mar 2023
Funding Agency Review	Nov 2023
Bid	Jan 2024
Begin Construction	Mar 2024
Complete Construction	Dec 2024

CHAPTER 8 CONCLUSION

This Water Facilities Planning Study analyzed the City of Albion's community water system. All aspects of the water system were analyzed from the groundwater source through the pumping facilities to the customer's tap. The current and future water system design and operations were analyzed through the lens of national and state standards to identify areas where the system was operating well and areas with deficiencies. The findings were used to develop alternatives to address various deficiencies including source water redundancy, fire flows and redundant fire flow capacity, and the need for distribution system improvements.

The current and future water demands (determined via population estimates/forecasts and production meter data) show that the system fails to meet both IDAPA's design basis, groundwater source redundancy, and redundant fire flow capacity requirements. Additionally, as soon as the City drills an additional well the pumping rate experienced by the City will occasionally exceed the City's water right diversion rate. There are numerous approaches that the City could undertake to address these issues. Of the alternatives presented in Chapter 5, the City is most interested in implementing *Alternative 1B –Increase Well #1, Two New Wells, & New 250,000 Gallon Tank*. Two possible phasing scenarios of this alternative are shown in Table 7-5.

A software hydraulic model of the water distribution system showed that the majority of nodes in the water system are able to meet the required fire flows. There are two areas lacking fire hydrants, and four waterlines that should be upsized and/or looped to increase fire flow. These improvements are included in *Alternative 2A – Distribution System Improvements*.

A recent sanitary survey found numerous significant deficiencies in the water system. Correction of these deficiencies are presented in *Alternative 3 – Sanitary Survey Improvements*. These items include required improvements for Well #1's wellhead and chlorination system, replacing the building and repairing the chlorination system for Well #2, developing a sampling plan and Operations & Maintenance Manual.

Alternative 4 – Recommended Improvements presents additional recommended improvements including installing tank mixers, a replacement CMU building for Well #1, a portable emergency generator, and SCADA improvements.

Alternative 5 – Meter Replacement & Automated Meter Reading is an optional but recommended alternative to replace the existing residential water meters due to their age and to improve the monthly meter reading task by enabling drive-by collection.

The above alternatives are compiling into a capital improvement plan presented in Table 7-1, and the impacts to user rates are shown in Table 7-4. The alternatives are likely to be funded by partial grant and partial loan. Based on Aberdeen's median household income the City may be eligible for a Community Development Block Grant from Idaho Department of Commerce for up to $500,000. The remaining funds would likely come from a loan from DEQ or USDA-RD. Expected annual loan repayments and monthly user rate increases necessary to repay these loans are explained in Chapter 7.

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APPENDIX A: REFERENCE INFORMATION

- NRCS Soil Report
- U.S. Fish & Wildlife Service IPaC Resource List
- FIRM Maps
- Income Survey Summary

United States Department of Agriculture

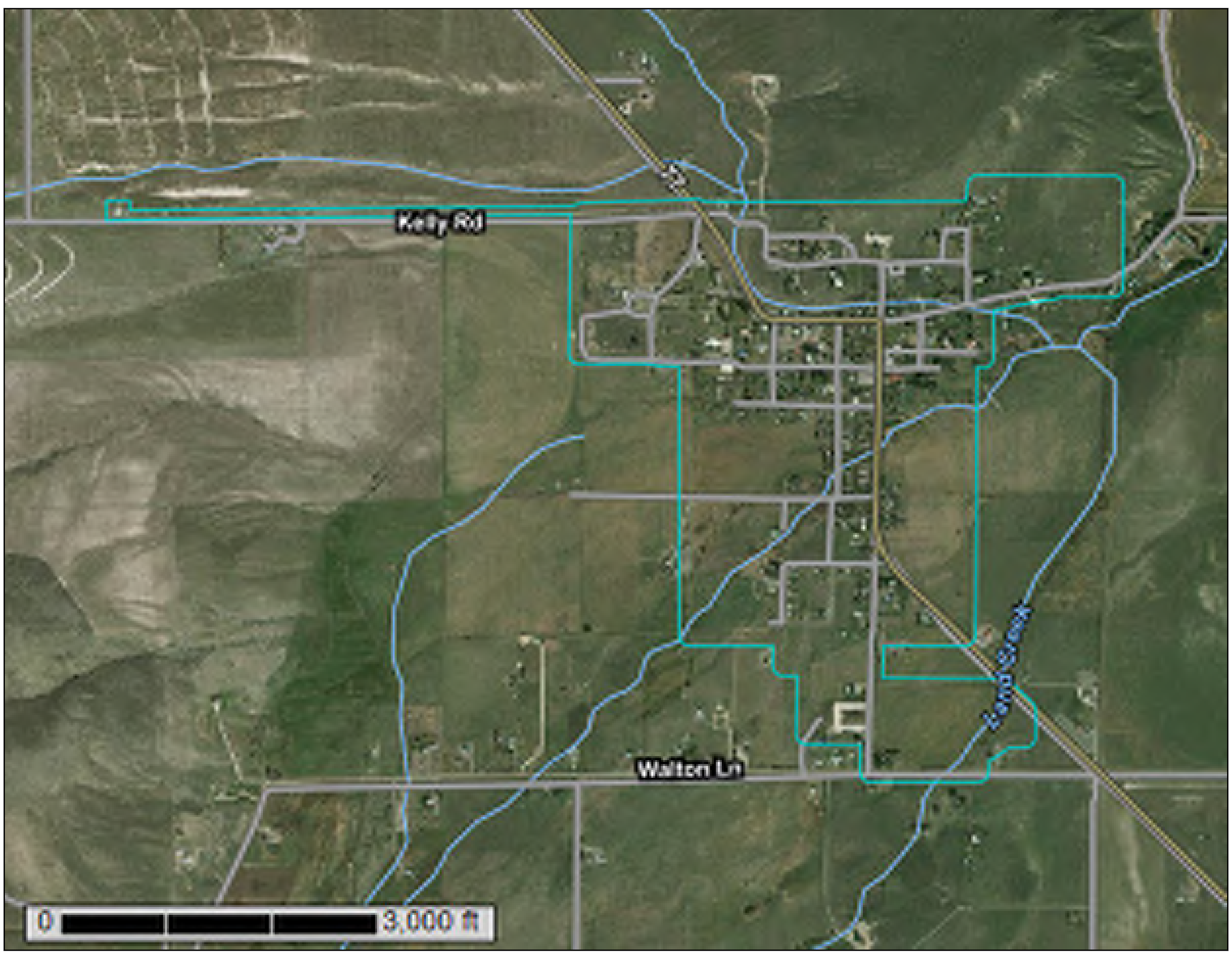
NRCS

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

Cassia County, Idaho, Eastern Part

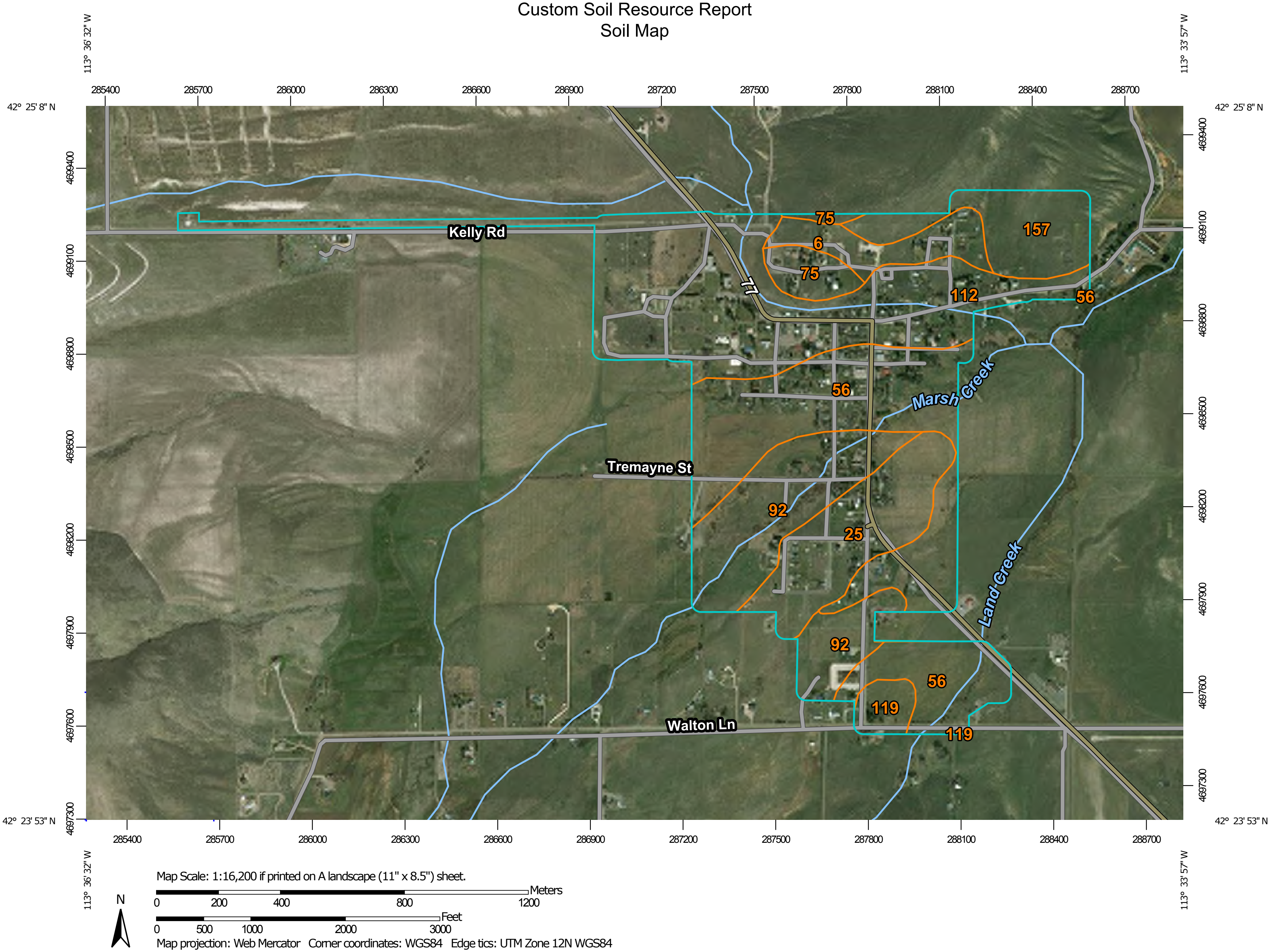


May 28, 2021

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 Scale: 1:16,200 if printed on A landscape (11" x 8.5") sheet.

Meters: 0, 200, 400, 800, 1200

Feet: 0, 500, 1000, 2000, 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

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
Spoil Area
Stony Spot
Very Stony Spot
Wet Spot
Other
Special Line Features

Water Features
Streams and Canals

Transportation
Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background
Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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: Cassia County, Idaho, Eastern Part
Survey Area Data: Version 15, Jun 4, 2020

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

Date(s) aerial images were photographed: Dec 31, 2009—Jul 8, 2016

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 Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
6	Arbone loam, 4 to 12 percent slopes	18.9	4.6%
25	Chatburn silt loam, 1 to 4 percent slopes	43.6	10.6%
56	Downata silt loam, 0 to 2 percent slopes	110.1	26.7%
75	Hutchley very gravelly silt loam, 10 to 35 percent slopes	11.5	2.8%
92	Kovich silt loam, 0 to 3 percent slopes	63.0	15.3%
112	Rexburg silt loam, 1 to 3 percent slopes	127.1	30.9%
119	Ririe silt loam, 1 to 3 percent slopes	7.6	1.9%
157	Watercanyon-Vitale-Rexburg association, 30 to 50 percent slopes	30.2	7.3%
Totals for Area of Interest		**412.0**	**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.

Cassia County, Idaho, Eastern Part

6—Arbone loam, 4 to 12 percent slopes

Map Unit Setting

National map unit symbol: 23f7k
Elevation: 5,790 to 6,330 feet
Mean annual precipitation: 14 to 18 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 65 to 95 days
Farmland classification: Farmland of statewide importance, if irrigated

Map Unit Composition

Arbone and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arbone

Setting

Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium with some loess influence

Typical profile

A - 0 to 10 inches: loam
Bw - 10 to 35 inches: loam
Bk - 35 to 60 inches: loam

Properties and qualities

Slope: 4 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R013XY001ID - LOAMY 12-16 - Provisional
Hydric soil rating: No

25—Chatburn silt loam, 1 to 4 percent slopes

Map Unit Setting

National map unit symbol: 2rv4
Elevation: 4,600 to 4,900 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 43 to 45 degrees F
Frost-free period: 85 to 100 days
Farmland classification: Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium

Map Unit Composition

Chatburn and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chatburn

Setting

Landform: Fan remnants, valley floors
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty alluvium and/or loess

Typical profile

Ap - 0 to 11 inches: silt loam
Btz - 11 to 14 inches: silty clay loam
Bkz - 14 to 60 inches: silt loam

Properties and qualities

Slope: 1 to 4 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
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 content: 35 percent
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 25.0
Available water capacity: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): 6s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Hydric soil rating: No

56—Downata silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2rw7
Elevation: 4,400 to 5,100 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 45 to 46 degrees F
Frost-free period: 85 to 100 days
Farmland classification: Prime farmland if irrigated and drained

Map Unit Composition

Downata and similar soils: 95 percent
Minor components: 4 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Downata

Setting

Landform: Flood plains, stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess and/or mixed alluvium

Typical profile

A - 0 to 10 inches: silt loam
Bg - 10 to 32 inches: silty clay loam
Cg - 32 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 45 percent
Maximum salinity: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 5.0
Available water capacity: High (about 11.2 inches)

Interpretive groups

Land capability classification (irrigated): 5w
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Minor Components

Aquolls, stratified

Percent of map unit: 4 percent

Landform: Depressions
Hydric soil rating: Yes

75—Hutchley very gravelly silt loam, 10 to 35 percent slopes

Map Unit Setting

National map unit symbol: 2rwx
Elevation: 5,200 to 7,000 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 55 to 85 days
Farmland classification: Not prime farmland

Map Unit Composition

Hutchley and similar soils: 75 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hutchley

Setting

Landform: Mountain slopes
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loess and/or alluvium and/or colluvium over bedrock derived from igneous rock and/or latite and/or andesite and/or quartz-monzonite

Typical profile

A - 0 to 7 inches: very gravelly silt loam
Bt - 7 to 14 inches: very cobbly clay loam
R - 14 to 24 inches: bedrock

Properties and qualities

Slope: 10 to 35 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
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
Available water capacity: Very low (about 1.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R013XY014ID - SHALLOW STONY 12-20 ARAR8/PSSPS
Hydric soil rating: No

92—Kovich silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2rxj
Elevation: 4,400 to 5,700 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 43 to 46 degrees F
Frost-free period: 80 to 100 days
Farmland classification: Prime farmland if irrigated and drained

Map Unit Composition

Kovich and similar soils: 85 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kovich

Setting

Landform: Flood plains, stream terraces, fan remnants
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Typical profile

A1 - 0 to 13 inches: silt loam
A2 - 13 to 27 inches: gravelly clay loam
C1 - 27 to 35 inches: gravelly loam
C2 - 35 to 38 inches: very gravelly sandy loam
2C3 - 38 to 60 inches: stratified very gravelly loamy sand to extremely cobbly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 2.00 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: C
Hydric soil rating: Yes

Minor Components

Aquolls, very gravelly throughout

Percent of map unit: 5 percent

Landform: Flood plains
Hydric soil rating: Yes

Downata

Percent of map unit: 5 percent
Landform: Flood plains
Hydric soil rating: Yes

112—Rexburg silt loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2rry
Elevation: 4,800 to 6,200 feet
Mean annual precipitation: 12 to 16 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 75 to 110 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Rexburg and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rexburg

Setting

Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium and/or loess

Typical profile

A - 0 to 15 inches: silt loam
Bw - 15 to 21 inches: silt loam
Bk - 21 to 60 inches: silt loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: High (about 12.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3c

Hydrologic Soil Group: B
Hydric soil rating: No

119—Ririe silt loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2rs5
Elevation: 4,600 to 7,000 feet
Mean annual precipitation: 12 to 18 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 70 to 100 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Ririe and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ririe

Setting

Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty alluvium and/or loess

Typical profile

A - 0 to 12 inches: silt loam
Bk - 12 to 45 inches: silt loam
C - 45 to 60 inches: silt loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 15.0
Available water capacity: High (about 12.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: B
Hydric soil rating: No

157—Watercanyon-Vitale-Rexburg association, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: 2rtj
Elevation: 4,500 to 7,500 feet
Mean annual precipitation: 12 to 20 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 60 to 115 days
Farmland classification: Not prime farmland

Map Unit Composition

Watercanyon and similar soils: 35 percent
Vitale, extremely stony surface, and similar soils: 25 percent
Rexburg and similar soils: 20 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Watercanyon

Setting

Landform: Mountain slopes, hillslopes
Landform position (two-dimensional): Toeslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Volcanic ash and/or silty alluvium and/or loess

Typical profile

A - 0 to 2 inches: silt loam
Bw - 2 to 16 inches: silt loam
Bk - 16 to 60 inches: very fine sandy loam

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Very slightly saline to slightly saline (2.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water capacity: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: R013XY008ID - STEEP SOUTH SLOPES 12-16 ARTRV/PSSPS
Hydric soil rating: No

Description of Vitale, Extremely Stony Surface

Setting

Landform: Mountain slopes
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Tephra and/or alluvium and/or colluvium over bedrock derived from welded tuff and/or rhyolite and/or quartz monzonite and/or sandstone and/or conglomerate and/or siltstone

Typical profile

A - 0 to 10 inches: stony loam
Bt - 10 to 30 inches: very cobbly clay loam
R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 30 to 50 percent
Surface area covered with cobbles, stones or boulders: 10.0 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
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
Available water capacity: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: R013XY008ID - STEEP SOUTH SLOPES 12-16 ARTRV/PSSPS
Hydric soil rating: No

Description of Rexburg

Setting

Landform: Mountain slopes
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Mixed alluvium and/or loess

Typical profile

A - 0 to 12 inches: silt loam
Bw - 12 to 18 inches: silt loam
Bk - 18 to 60 inches: silt loam

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: High (about 12.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: R013XY008ID - STEEP SOUTH SLOPES 12-16 ARTRV/PSSPS
Hydric soil rating: No

Minor Components

Aquolls, seeps and springs

Percent of map unit: 2 percent
Landform: Depressions
Hydric soil rating: Yes

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

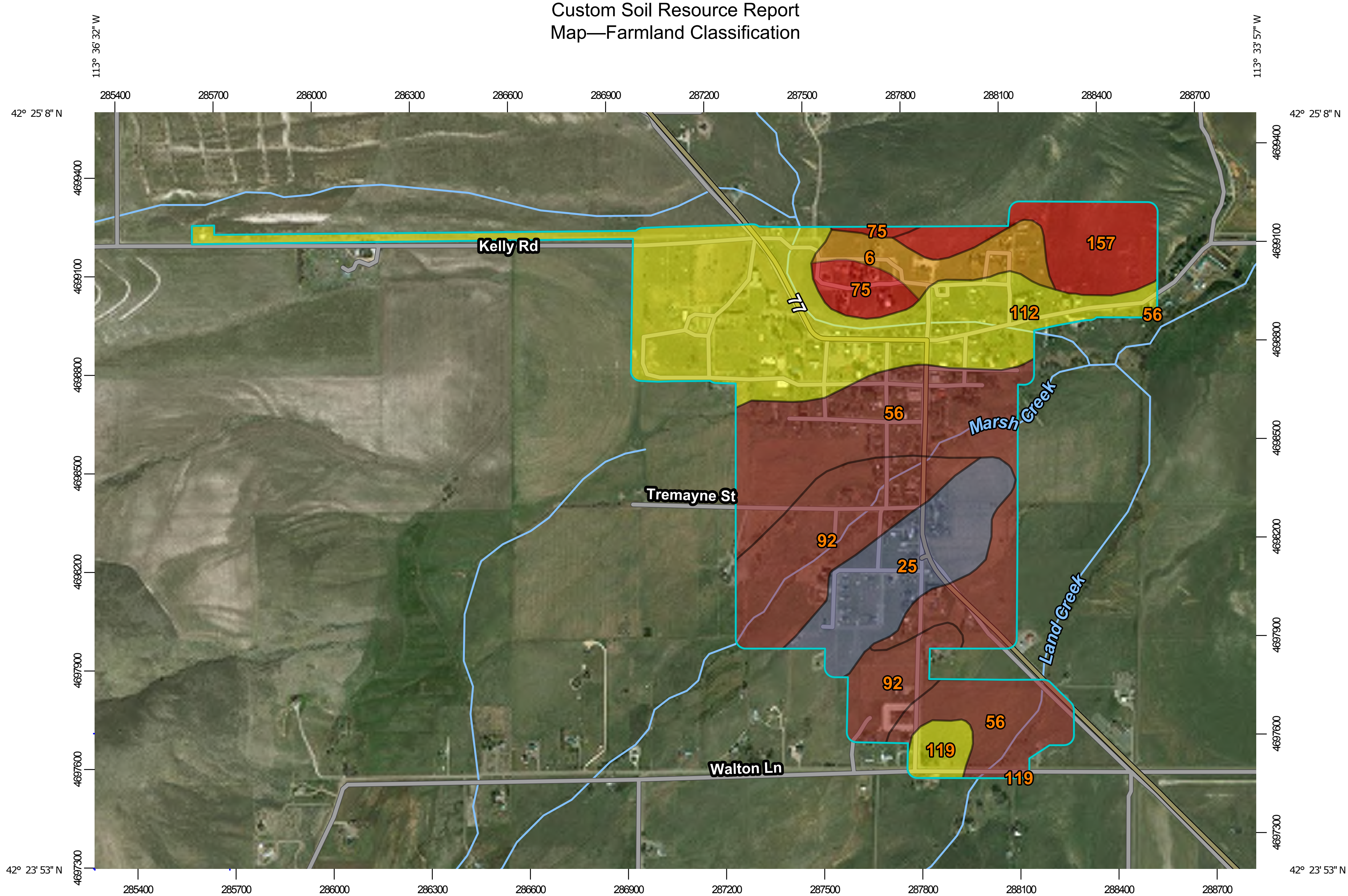
Land Classifications

Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Farmland Classification

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Custom Soil Resource Report
Map—Farmland Classification



Map Scale: 1:16,200 if printed on A landscape (11" x 8.5") sheet.

N

0 200 400 800 1200 Meters

0 500 1000 2000 3000 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of statewide importance, if drained
- Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated
- Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated and drained
- Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
- Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough
- Farmland of statewide importance, if thawed
- Farmland of local importance
- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

Soil Rating Lines

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of statewide importance, if drained
- Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated
- Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated and drained
- Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
- Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough
- Farmland of statewide importance, if thawed
- Farmland of local importance
- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

Soil Rating Points

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of statewide importance, if drained
- Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated

Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season

Farmland of statewide importance, if irrigated and drained

Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season

Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer

Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60

Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium

Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season

Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season

Farmland of statewide importance, if warm enough

Farmland of statewide importance, if thawed

Farmland of local importance

Farmland of local importance, if irrigated

Farmland of unique importance

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:24,000.

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: Cassia County, Idaho, Eastern Part
Survey Area Data: Version 15, Jun 4, 2020

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

Date(s) aerial images were photographed: Dec 31, 2009—Jul 8, 2016

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.

Table—Farmland Classification

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
6	Arbone loam, 4 to 12 percent slopes	Farmland of statewide importance, if irrigated	18.9	4.6%
25	Chatburn silt loam, 1 to 4 percent slopes	Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium	43.6	10.6%
56	Downata silt loam, 0 to 2 percent slopes	Prime farmland if irrigated and drained	110.1	26.7%
75	Hutchley very gravelly silt loam, 10 to 35 percent slopes	Not prime farmland	11.5	2.8%
92	Kovich silt loam, 0 to 3 percent slopes	Prime farmland if irrigated and drained	63.0	15.3%
112	Rexburg silt loam, 1 to 3 percent slopes	Prime farmland if irrigated	127.1	30.9%
119	Ririe silt loam, 1 to 3 percent slopes	Prime farmland if irrigated	7.6	1.9%
157	Watercanyon-Vitale-Rexburg association, 30 to 50 percent slopes	Not prime farmland	30.2	7.3%
Totals for Area of Interest			**412.0**	**100.0%**

Rating Options—Farmland Classification

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

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IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Cassia County, Idaho

Local office

Idaho Fish And Wildlife Office

(208) 378-5243
(208) 378-5262

1387 South Vinnell Way, Suite 368
Boise, ID 83709-1657

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

Canada Lynx Lynx canadensis — Threatened

There is **final** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/3652

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Golden Eagle Aquila chrysaetos This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/1680	Breeds Dec 1 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any

week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

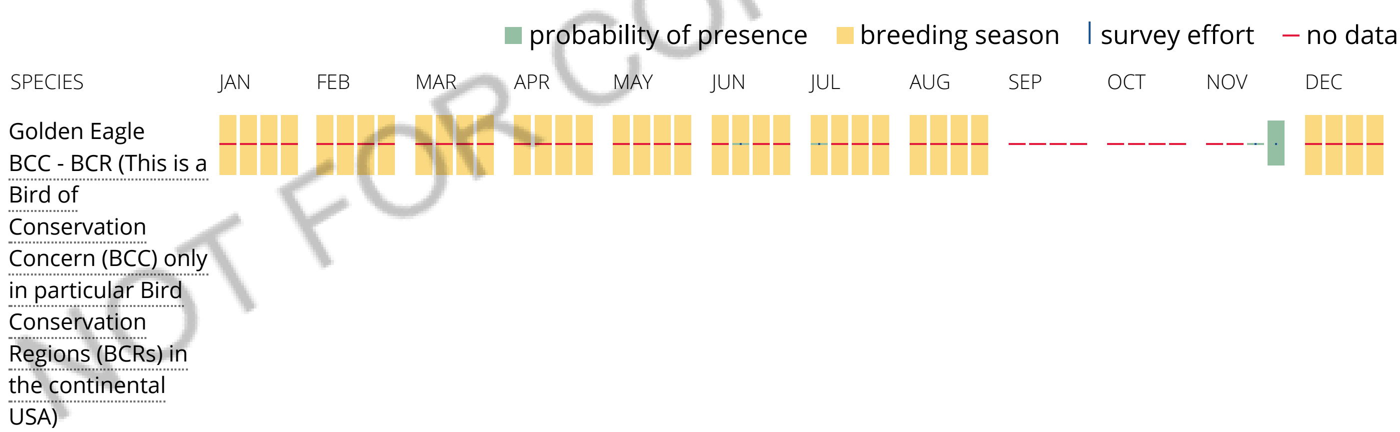
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures] describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures] or [permits] may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern (BCC)] and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

RIVERINE
- R5UBH
- R4SBC

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

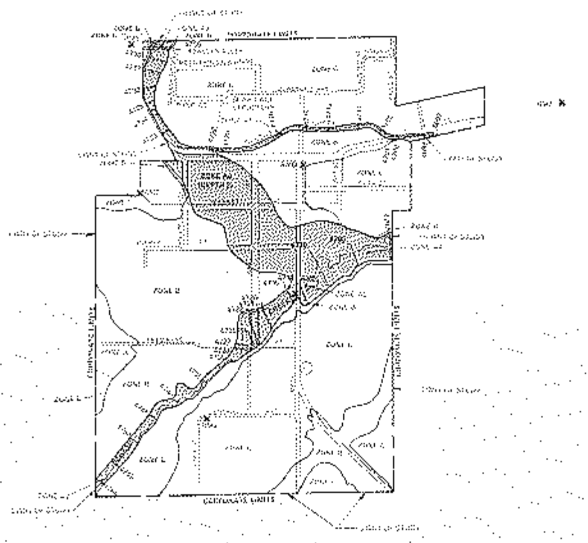
Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

ELEVATION REFERENCE MARKS



KEY TO MAP

EXPLANATION OF ZONE DESIGNATIONS

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

CITY OF

ALBION, IDAHO

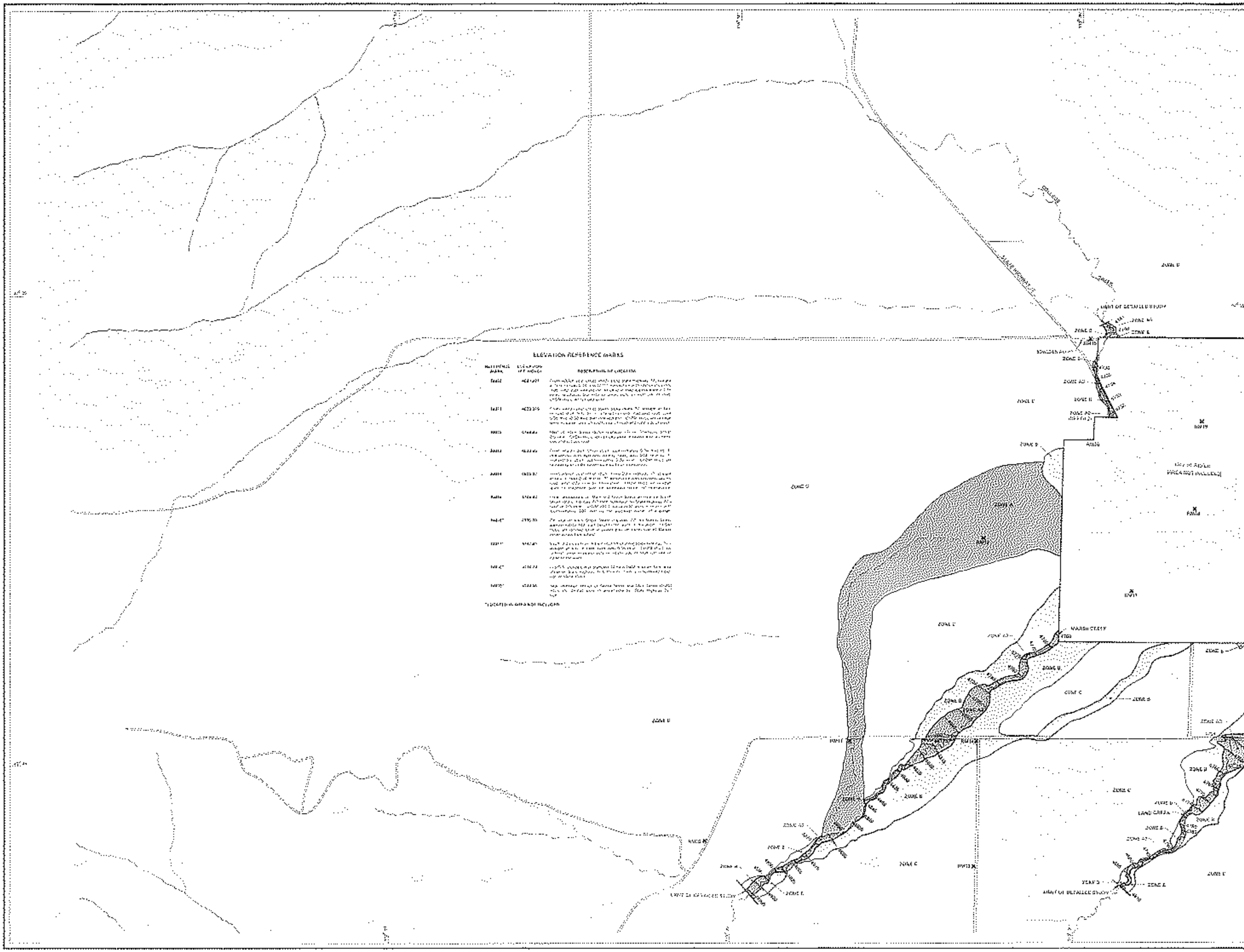
CASSIA COUNTY

ONLY PANEL PRINTED

COMMUNITY-PANEL NUMBER
160042 0001 A

EFFECTIVE DATE:
AUGUST 15, 1983

Federal Emergency Management Agency



NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CASSIA COUNTY,
IDAHO
(UNINCORPORATED AREA)

PANEL 253 OF 775

COMMUNITY-PANEL NUMBER
160041 0253 B

EFFECTIVE DATE:
AUGUST 15, 1983

Federal Emergency Management Agency


KEY TO MAP
EXPLANATION OF ZONE DESIGNATIONS
ZONE C
ZONE A
ZONE B
ELEVATION REFERENCE MARKS
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
CASSIA COUNTY,
IDAHO
UNINCORPORATED AREA
PANEL 254 OF 775
COMMUNITY-PANEL NUMBER
160041 0254 B
EFFECTIVE DATE:
AUGUST 15, 1983
Federal Emergency Management Agency

11/5/2019
City of Albion
LMI Survey Report

Per the most recent American Community Survey (ACS), the City of Albion's LMI was 35.3%. Because the Mayor and Council felt there was a discrepancy in the ACS survey, they chose to conduct an LMI survey so that they could pursue CDBG funding for future community projects.

On June 19, 2019 Idaho Department of Commerce sent an email approving the methodology and supporting documentation for the City of Albion to move forward with the income survey.

The City of Albion has a population of 255 and it was decided that the city would send out a letter informing the community of the survey on June 27, 2019.

The City sent Region IV an address list, and we at Region IV cleaned up this list, randomized it, and prepared the mailings for the City. After the letter was sent to the community, the letter and survey's for round 1 were mailed out to the citizens. Envelopes were made so that citizens would mail the surveys back to Region IV. Using the Survey Systems calculator, it was determined that the City needed a sample size of at least 86, and with 75% response this meant 65 valid responses were needed. Due to the size of the survey, it was decided to mail out 96 surveys rather than the minimum of 86 to help meet the response requirement. This mailing took place on July 11, 2019. We received 49 valid responses, 1 invalid response and had to replace 4 surveys because the citizens had moved. The first attempt mailing created an LMI of 45.38% for the first round. Once we started receiving only a couple responses per day, we got ready to knock on doors.

The City began round 2 knocking on doors on September 20th. The address list for round 2 were those who did not respond in round 1, as well as any replacements for vacancies and refusals? The door knocking was done by the Mayor and Councilpersons. In round 2 we received 16 more surveys, putting us over the minimum response requirement. This was completed on October 30, 2019. The LMI for round 2 was 64.71%.

Each address had a random number assigned to it alphabetically by address. These numbers ranged from 1 to 110. These numbers tie back into the randomization list found in this report. The addresses that were chosen to receive a survey through the randomization were also given a survey identification number (1-110) to simplify the tracking process. The final LMI numbers were **65 valid responses and an LMI of 51.18%.**

Within this document are the sample size calculator results, copy of the random numbers generated (also shows the replacements), maps of the survey and project benefit areas, LMI tabulation sheets, a copy of the original survey, and scans of all surveys that were received throughout the process

APPENDIX B: WATER RIGHTS

- Water Right Reports

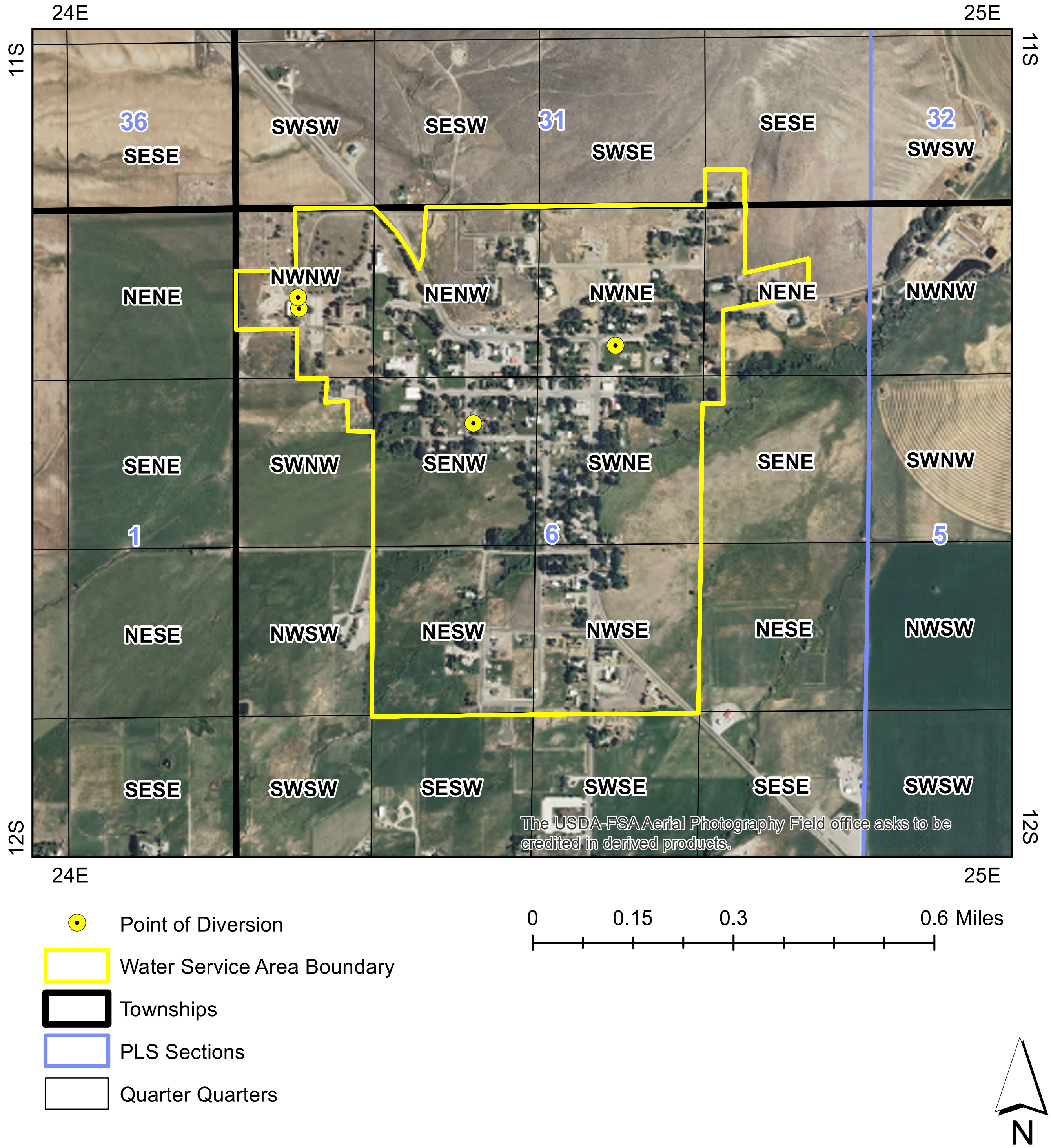
State of Idaho
Department of Water Resources

Water Right

45-2725

MUNICIPAL

The map depicts the place of use for the water use listed above and point(s) of diversion of this right as currently derived from interpretations of the paper records and is used solely for illustrative purposes. Discrepancies between the computer representation and the permanent document file will be resolved in favor of the actual water right documents in the water right file.



Map produced on May 20, 2021

IDAHO Department of Water Resources

IDWR offices are open to the public and following the CDC guidelines for wearing masks and observing social distancing. For in-person visits, we encourage you to call ahead for an appointment.

WATER RIGHT REPORT

5/20/2021

IDAHO DEPARTMENT OF WATER RESOURCES

Water Right Report

WATER RIGHT NO. 45-2725

Owner Type	Name and Address
Current Owner	CITY OF ALBION PO BOX 147 ALBION, ID 83311 2086735352

Priority Date: 09/19/1966

Basis: Decreed

Status: Active

Source	Tributary
GROUND WATER	

Beneficial Use	From	To	Diversion Rate	Volume
MUNICIPAL	1/01	12/31	0.6 CFS	
Total Diversion			0.6 CFS	

Location of Point(s) of Diversion:

GROUND WATER	SWNWNE	Sec. 06	Township 12S	Range 25E	CASSIA County
GROUND WATER	SENWNW	Sec. 06	Township 12S	Range 25E	CASSIA County
GROUND WATER	SENWNW	Sec. 06	Township 12S	Range 25E	CASSIA County
GROUND WATER	NESENW	Sec. 06	Township 12S	Range 25E	CASSIA County

Place(s) of use: Large POU Info

Conditions of Approval:

1.	C18	This partial decree is subject to such general provisions necessary for the definition of the rights or for the efficient administration of the water rights as may be ultimately determined by the Court at a point in time no later than the entry of a final unified decree. Section 42-1412(6), Idaho Code.
2.	C03	RIGHT INCLUDES ACCOMPLISHED CHANGE IN POINT OF DIVERSION PURSUANT TO SECTION 42-1425, IDAHO CODE.
3.	J03	Place of use is within the city of Albion and surrounding service area.

Dates:

Licensed Date:

Decreed Date: 05/06/2005

Permit Proof Due Date:

Permit Proof Made Date:

Permit Approved Date:

Permit Moratorium Expiration Date:

Enlargement Use Priority Date:

Enlargement Statute Priority Date:

Water Supply Bank Enrollment Date Accepted:

Water Supply Bank Enrollment Date Removed:

Application Received Date:

Protest Deadline Date:

Number of Protests: 0

Other Information:

State or Federal: S

Owner Name Connector:

Water District Number: 140

Generic Max Rate per Acre:

Generic Max Volume per Acre:

Civil Case Number:

Old Case Number:

Decree Plantiff:

Decree Defendant:

Swan Falls Trust or Nontrust:

Swan Falls Dismissed:

DLE Act Number:

Cary Act Number:

Mitigation Plan: False

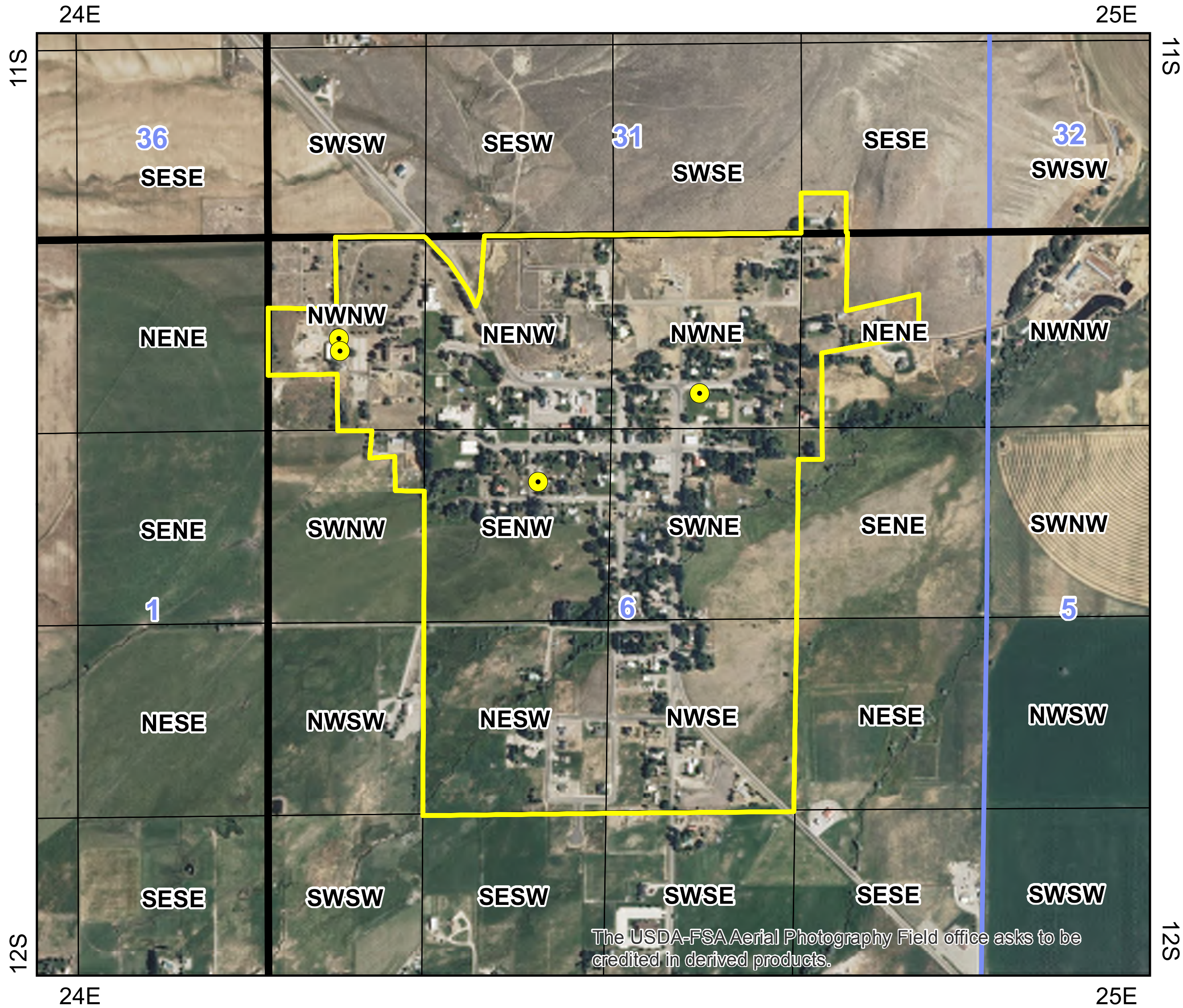
State of Idaho
Department of Water Resources

Water Right

45-10633

MUNICIPAL

The map depicts the place of use for the water use listed above and point(s) of diversion of this right as currently derived from interpretations of the paper records and is used solely for illustrative purposes. Discrepancies between the computer representation and the permanent document file will be resolved in favor of the actual water right documents in the water right file.



Point of Diversion
Water Service Area Boundary
Townships
PLS Sections
Quarter Quarters

0 0.15 0.3 0.6 Miles

N

Map produced on May 20, 2021

Department of
Water Resources

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WATER RIGHT REPORT

5/20/2021

IDAHO DEPARTMENT OF WATER RESOURCES

Water Right Report

WATER RIGHT NO. 45-10633

Owner Type	Name and Address
Current Owner	CITY OF ALBION PO BOX 147 ALBION, ID 83311 2086735352

Priority Date: 12/31/1927

Basis: Decreed

Status: Active

Source	Tributary
GROUND WATER	

Beneficial Use	From	To	Diversion Rate	Volume
MUNICIPAL	1/01	12/31	0.44 CFS	
Total Diversion			0.44 CFS	

Location of Point(s) of Diversion:

GROUND WATER	SWNWNE Lt 2	Sec. 06	Township 12S	Range 25E	CASSIA County
GROUND WATER	SENWNW Lt 4	Sec. 06	Township 12S	Range 25E	CASSIA County
GROUND WATER	SENWNW Lt 4	Sec. 06	Township 12S	Range 25E	CASSIA County
GROUND WATER	NESENW	Sec. 06	Township 12S	Range 25E	CASSIA County

Place(s) of use: Large POU Info

Conditions of Approval:

1.	J03	Place of use is within the city of Albion and surrounding service area.
2.		USE OF THE RIGHTS LISTED BELOW IS LIMITED TO A TOTAL COMBINED DIVERSION RATE OF 0.50 CFS AND TO A TOTAL COMBINED ANNUAL DIVERSION VOLUME OF 96.7 AF. COMBINED RIGHT NOS. 45-10633 and 45-10634
3.	C18	This partial decree is subject to such general provisions necessary for the definition of the rights or for the efficient administration of the water rights as may be ultimately determined by the Court at a point in time no later than the entry of a final unified decree. Section 42-1412(6), Idaho Code.

Dates:

Licensed Date:

Decreed Date: 05/13/2005

Enlargement Use Priority Date:

Enlargement Statute Priority Date:

Water Supply Bank Enrollment Date Accepted:

Water Supply Bank Enrollment Date Removed:

Application Received Date:

Protest Deadline Date:

Number of Protests: 0

Other Information:

State or Federal: S

Owner Name Connector:

Water District Number: 140

Generic Max Rate per Acre:

Generic Max Volume per Acre:

Combined Acres Limit:

Combined Volume Limit: 96.7

Combined Rate Limit: 0.5

Civil Case Number:

Old Case Number:

Decree Plantiff:

Decree Defendant:

Swan Falls Trust or Nontrust:

Swan Falls Dismissed:

DLE Act Number:

Cary Act Number:

Mitigation Plan: False

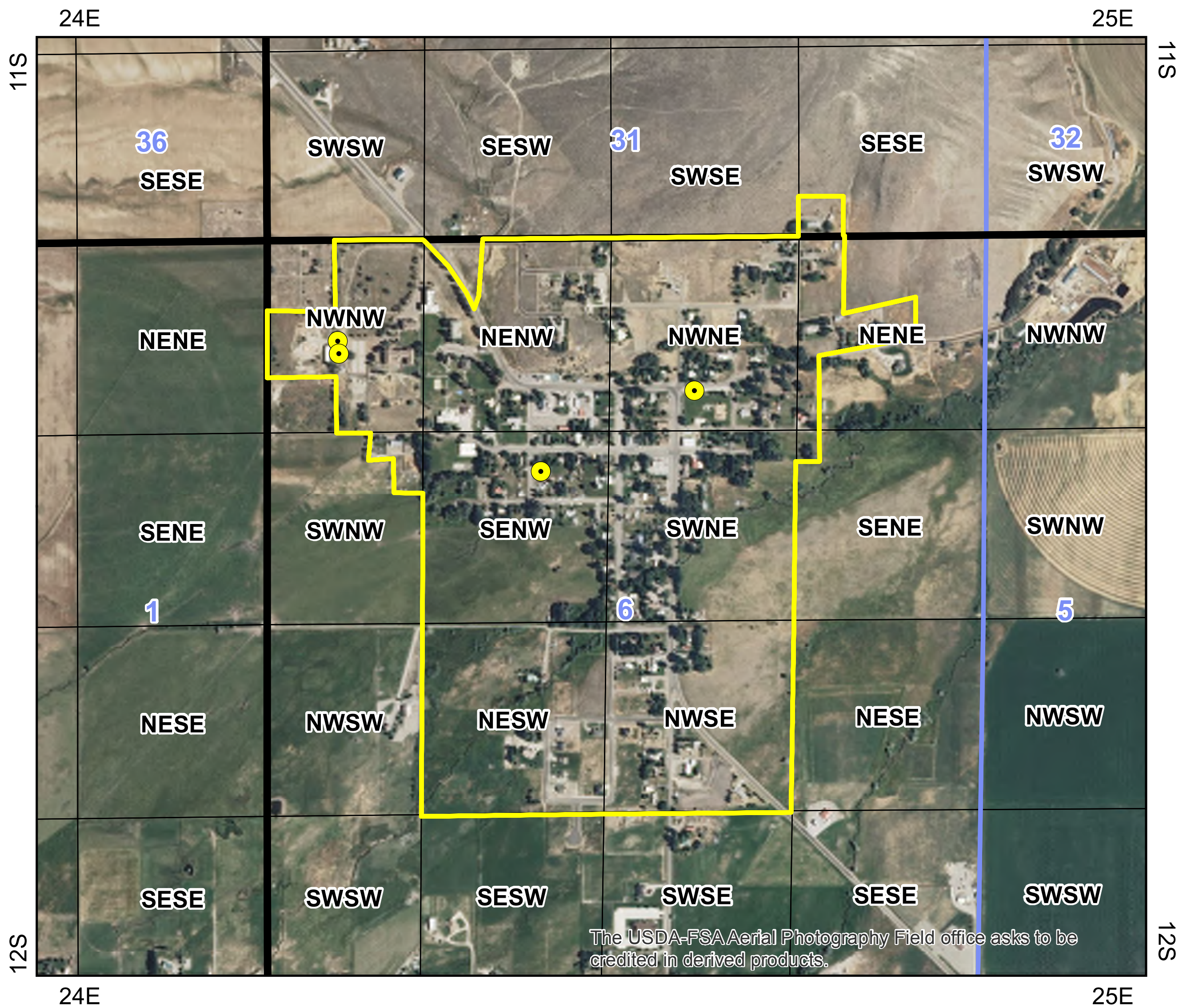
State of Idaho
Department of Water Resources

Water Right

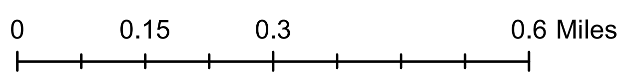
45-10634

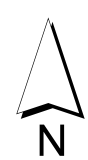
MUNICIPAL

The map depicts the place of use for the water use listed above and point(s) of diversion of this right as currently derived from interpretations of the paper records and is used solely for illustrative purposes. Discrepancies between the computer representation and the permanent document file will be resolved in favor of the actual water right documents in the water right file.



Point of Diversion
Water Service Area Boundary
Townships
PLS Sections
Quarter Quarters





Map produced on May 20, 2021

IDAHO Department of Water Resources

IDWR offices are open to the public and following the CDC guidelines for wearing masks and observing social distancing. For in-person visits, we encourage you to call ahead for an appointment.

WATER RIGHT REPORT

5/20/2021

IDAHO DEPARTMENT OF WATER RESOURCES

Water Right Report

WATER RIGHT NO. 45-10634

Owner Type	Name and Address
Current Owner	CITY OF ALBION PO BOX 147 ALBION, ID 83311 2086735352

Priority Date: 12/31/1911

Basis: Decreed

Status: Active

Source	Tributary
GROUND WATER	

Beneficial Use	From	To	Diversion Rate	Volume
MUNICIPAL	01/01	12/31	0.5 CFS	
Total Diversion			0.5 CFS	

Location of Point(s) of Diversion:

GROUND WATER	SWNWNE Lt 4	Sec. 06	Township 12S	Range 25E	CASSIA County
GROUND WATER	SENWNW Lt 4	Sec. 06	Township 12S	Range 25E	CASSIA County
GROUND WATER	SENWNW Lt 4	Sec. 06	Township 12S	Range 25E	CASSIA County
GROUND WATER	NESENW Lt 4	Sec. 06	Township 12S	Range 25E	CASSIA County

Place(s) of use: Large POU Info

Conditions of Approval:

1.		Place of use is within the city of Albion and surrounding service area.
2.	C18	This partial decree is subject to such general provisions necessary for the definition of the rights or for the efficient administration of the water rights as may be ultimately determined by the Court at a point in time no later than the entry of a final unified decree. Section 42-1412(6), Idaho Code.
3.		USE OF THE RIGHTS LISTED BELOW IS LIMITED TO A TOTAL COMBINED DIVERSION RATE OF 0.50 CFS AND TO A TOTAL COMBINED ANNUAL DIVERSION VOLUME OF 96.7 AF. COMBINED RIGHT NOS. 45-10633 and 45-10634

Dates:

Licensed Date:

Decreed Date: 05/13/2005

Enlargement Use Priority Date:

Enlargement Statute Priority Date:

Water Supply Bank Enrollment Date Accepted:

Water Supply Bank Enrollment Date Removed:

Application Received Date:

Protest Deadline Date:

Number of Protests: 0

Other Information:

State or Federal: S

Owner Name Connector:

Water District Number: 140

Generic Max Rate per Acre:

Generic Max Volume per Acre:

Combined Acres Limit:

Combined Volume Limit: 96.7

Combined Rate Limit: 0.5

Civil Case Number:

Old Case Number:

Decree Plantiff:

Decree Defendant:

Swan Falls Trust or Nontrust:

Swan Falls Dismissed:

DLE Act Number:

Cary Act Number:

Mitigation Plan: False

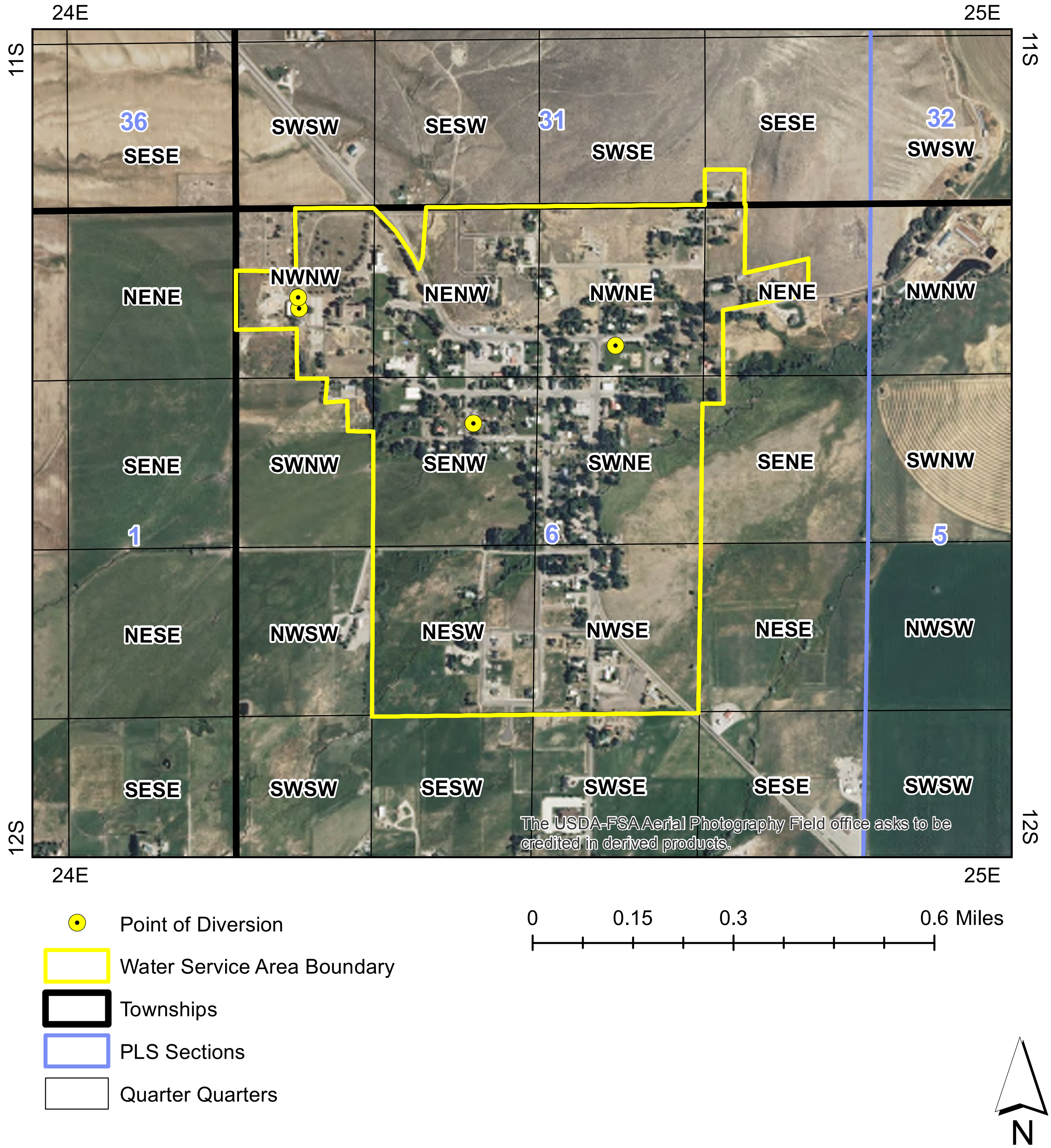
State of Idaho
Department of Water Resources

Water Right

45-10635

MUNICIPAL

The map depicts the place of use for the water use listed above and point(s) of diversion of this right as currently derived from interpretations of the paper records and is used solely for illustrative purposes. Discrepancies between the computer representation and the permanent document file will be resolved in favor of the actual water right documents in the water right file.



Map produced on May 20, 2021

IDAHO Department of Water Resources

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WATER RIGHT REPORT

5/20/2021

IDAHO DEPARTMENT OF WATER RESOURCES

Water Right Report

WATER RIGHT NO. 45-10635

Owner Type	Name and Address
Current Owner	CITY OF ALBION PO BOX 147 ALBION, ID 83311 2086735352

Priority Date: 12/31/1956

Basis: Decreed

Status: Active

Source	Tributary
GROUND WATER	

Beneficial Use	From	To	Diversion Rate	Volume
MUNICIPAL	01/01	12/31	0.35 CFS	
Total Diversion			0.35 CFS	

Location of Point(s) of Diversion:

GROUND WATER	SWNWNE	Sec. 06	Township 12S	Range 25E	CASSIA County
GROUND WATER	SENWNW	Sec. 06	Township 12S	Range 25E	CASSIA County
GROUND WATER	SENWNW	Sec. 06	Township 12S	Range 25E	CASSIA County
GROUND WATER	NESENW	Sec. 06	Township 12S	Range 25E	CASSIA County

Place(s) of use: Large POU Info

Conditions of Approval:

1.	C18	This partial decree is subject to such general provisions necessary for the definition of the rights or for the efficient administration of the water rights as may be ultimately determined by the Court at a point in time no later than the entry of a final unified decree. Section 42-1412(6), Idaho Code.
2.	J03	Place of use is within the city of Albion and surrounding service area.

Dates:

Licensed Date:

Decreed Date: 05/13/2005

Enlargement Use Priority Date:

Enlargement Statute Priority Date:

Water Supply Bank Enrollment Date Accepted:

Water Supply Bank Enrollment Date Removed:

Application Received Date:

Protest Deadline Date:

Number of Protests: 0

Other Information:

State or Federal: S

Owner Name Connector:

Water District Number: 140

Generic Max Rate per Acre:

Generic Max Volume per Acre:

Civil Case Number:

Old Case Number:

Decree Plantiff:

Decree Defendant:

Swan Falls Trust or Nontrust:

Swan Falls Dismissed:

DLE Act Number:

Cary Act Number:

Mitigation Plan: False

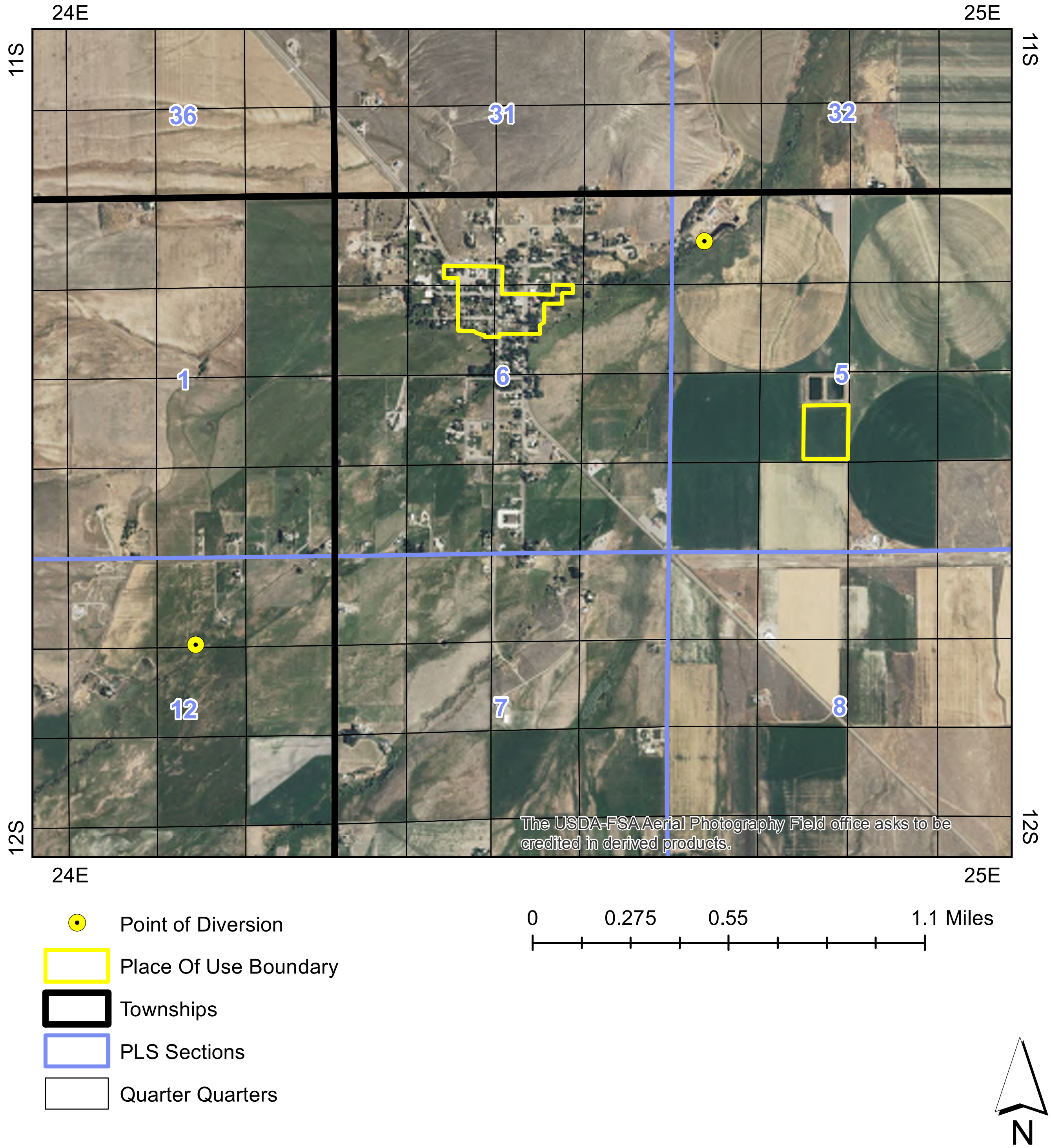
State of Idaho
Department of Water Resources

Water Right

45-14165

IRRIGATION

The map depicts the place of use for the water use listed above and point(s) of diversion of this right as currently derived from interpretations of the paper records and is used solely for illustrative purposes. Discrepancies between the computer representation and the permanent document file will be resolved in favor of the actual water right documents in the water right file.



Map produced on May 20, 2021

IDAHO Department of Water Resources

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WATER RIGHT REPORT

5/20/2021

IDAHO DEPARTMENT OF WATER RESOURCES

Water Right Report

WATER RIGHT NO. 45-14165

Owner Type	Name and Address
Current Owner	CITY OF ALBION PO BOX 147 ALBION, ID 83311 2086735352

Priority Date: 04/01/1873

Basis: Decreed

Status: Active

Source	Tributary
MARSH CREEK	SNAKE RIVER

Beneficial Use	From	To	Diversion Rate	Volume
IRRIGATION	04/01	10/31	0.91 CFS	
Total Diversion			0.91 CFS	

Location of Point(s) of Diversion:

MARSH CREEK	SWNWNE	Sec. 12	Township 12S	Range 24E	CASSIA County
MARSH CREEK	NWNW	Sec. 05	Township 12S	Range 25E	CASSIA County

IRRIGATION Use:

Acre Limit: 37.8

Place(s) of use:

Place of Use Legal Description: IRRIGATION CASSIA County

Township	Range	Section	Lot	Tract	Acres	Lot	Tract	Acres	Lot	Tract	Acres	Lot	Tract	Acres
12S	25E	5		NESW	20									
		6	1	NENE	0.6	2	NWNE	12		SWNE	22			
			3	NENW	8	4	NWNW	0.5		SENW	20			

Total Acres: 83.1

Conditions of Approval:

1.	X27	This right is limited to the irrigation of 37.8 acres within the authorized place of use in a single irrigation season.
2.	206	Right 45-14165, is limited to the irrigation of a specific 37.8 acres within the 83.1 acre place of use authorized by this right in a single irrigation season. The specific 37.8 acres to be irrigated by the right holder are shown in the electronic shape file associated with these rights in the geographic information system component of the water rights database maintained by the department. Before changing the 37.8 acres to be irrigated within the 83.1 acre place of use, the right holder shall submit a new land list and representative electronic shape file or map to the Department prior to the irrigation season in which the change will occur.
3.		Water diversion at NW NW Sec. 5 Twp 12 S Rge 25 E shall not be permitted at any time when the watermaster has diverted the entire flow of Marsh Creek into the Vaughn Ditch.
4.	X61	The period of use for the irrigation described in this approval may be extended to a beginning date of 3/15 provided that beneficial use of the water can be shown and other elements of the right are not exceeded. The use of water before 4/1 is subordinate to all water rights having no subordinated early or late irrigation use and a priority date earlier than May 6, 2005.
5.	R05	Use of water under this right will be regulated by a watermaster with responsibility for the distribution of water among appropriators within a water district. At the time of this approval, this water right is within State Water District No. 45-F.
6.	R43	The right holder shall maintain a measuring device and lockable controlling works of a type approved by the Department in a manner that will provide the watermaster suitable control of the diversion(s).
7.	T07	The right holder shall accomplish the change authorized by this transfer within one year of the date of this approval.
8.	T08	Failure of the right holder to comply with the conditions of this transfer is cause for the Director to rescind approval of the transfer.
9.	T19	Pursuant to Section 42-1412(6), Idaho Code, this water right is subject to such general provisions necessary for the definition of the rights or for the efficient administration of water rights as may be determined by the Snake River Basin Adjudication court at a point in time no later than the entry of the final unified decree.

Dates:

Licensed Date:

Decreed Date: 05/06/2005

Enlargement Use Priority Date:

Enlargement Statute Priority Date:

Water Supply Bank Enrollment Date Accepted:

Water Supply Bank Enrollment Date Removed:

Application Received Date:

Protest Deadline Date:

Number of Protests: 0

Other Information:

State or Federal: S

Owner Name Connector:

Water District Number: 45F

Generic Max Rate per Acre:

Generic Max Volume per Acre:

Civil Case Number:

Old Case Number:

Decree Plantiff:

Decree Defendant:

Swan Falls Trust or Nontrust:

Swan Falls Dismissed:

DLE Act Number:

Cary Act Number:

Mitigation Plan: False

APPENDIX C: WELL DATA

- Well Logs
- 2004 Well Yield Evaluation and Water Supply Resource Assessment Report

IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY

TRANSMITTAL COVER SHEET

FAX NUMBER (208) 373-0143
THIRD FLOOR, TECHNICAL SERVICES

DATE: 3-23-04

TO: Star Johnson - MSE
PHONE: 345-8292
FAX: 344-8007

FROM: Robert Taylor
PHONE: 373-0319
FAX: 208-373-0143

DOCUMENT DESCRIPTION:
Albion Well #1 log

TOTAL NUMBER OF PAGES (INCLUDING THIS COVER SHEET): 2

IF YOU DO NOT RECEIVE ENTIRE FAX CALL: (208) 373-0193

COMMENTS:

FAX.FRM

6-22

[illegible]

RECEIVED
DEC 15 1992
... OF
... QUALITY
... OFFICE

ALBION WELL

DEPTH	DESCRIPTION

1 to 15--Clay

15 to 21-- Gravel With water

21 to 44-- Yellow clay

44 to 72-- Yellow sand rock- little water on top of rock

72 to 120-- Gray sand rock

120 to 135-- Gravel and boulders

135 to 145-- Gray sand rock

145 to 220-- Mixture of ~~[illegible]~~ Lime Rock-~~end~~-of 15 inch hole.

220 to 244-- Gray sand rock with 12 inch hole-

244 to 252-- Gravel

252 to 256-- Lava (blakk)

256 to 270-- Gravel

270 to 280-- Sand rock (Gray)

280 to284-- Porus sand rock with a little water

284 to 330-- Gravel

330 to 334-- Black sand rock and fine gravel

334 to 354-- Black sand rock

354 to 358-- Black sand * with some water-

****

250 gal a minute
Drawdown on pump 66'
Water raise to within 11' of surface

REPORT OF WELL DRILLER
State of Idaho

RECEIVED
AUG 6 1968
Department of Reclamation

State law requires that this report shall be filed with the State Reclamation Engineer within 30 days after completion or abandonment of the well.

WELL OWNER:
Name: Village of Albion
Address: Albion Idaho

Owner's Permit No. 9-33224

NATURE OF WORK (check): Replacement well ☐ New well ☑ Deepened ☐ Abandoned ☐

Water is to be used for:

METHOD OF CONSTRUCTION: Rotary ☐ Cable ☐ Dug ☐ Other (explain)

CASING SCHEDULE: Threaded — Welded ✓
20 "Diam. from 0 ft. to 82 ft.
16 "Diam. from 0 ft. to 258 ft.
12 "Diam. from 239 ft. to 500 ft.
10 "Diam. from 492 ft. to 710 ft.
Thickness of casing: Material:
Steel ☐ concrete ☐ wood ☐ other ☐ (explain)

PERFORATED? Yes ☑ No ☐ Type of perforator used: mill knife factory

Size of perforations: " by "
mill knife perforations from 110 ft. to 239 ft.
perforations from 239 ft. to 258 ft.
factory perforations from 492 ft. to 700 ft.
perforations from ft. to ft.

WAS SCREEN INSTALLED? Yes ☐ No ☐
Manufacturer's name
Type Model No.
Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

CONSTRUCTION: Well gravel packed? Yes ☐ No. ☐ size of gravel Gravel placed from ft. to ft. Surface seal provided? Yes ☑ No ☐ To what depth? 82 ft. Material used in seal: 20" pipe cement & Bentonite Clay & Hay

Did any strata contain unusable water? Yes ☐ No. ☐ Type of water:
Depth of strata ft. Method of sealing strata off:

Surface casing used? Yes ☐ No. ☐
Cemented in place? Yes ☐ No ☐

Locate well in section

Sec.

LOCATION OF WELL: County Cassia
¼ ¼ Sec. 6 T. 12 N/S R. E/W

1 block south & 1 block west of Bank building

Use other side for additional remarks

Size of drilled hole: 20 Total depth of well: 710 Standing water level below ground: 12' 9" Temp. Fahr. ° Test delivery: gpm or cfs Pump? ☐ Bail ☐
Size of pump and motor used to make test:

Length of time of test: Hrs. Min.
Drawdown: ft. Artesian pressure: ft. above land surface Give flow cfs or gpm. Shutoff pressure:
Controlled by: Valve ☐ Cap ☐ Plug ☐ No control ☐ Does well leak around casing? Yes ☐ No ☐

038347

DEPTH FROM FEET	DEPTH TO FEET	MATERIAL	WATER YES OR NO
0	5	soil	
5	22	boulders	
22	34	Clay	
34	45	Clay & boulders	
45	90	brown sandstone	
90	125	Gray sandstone	
125	143	sandstone	
143	149	boulders & Clay	
149	175	Gray sandstone	
175	185	Conglomeration	
185	263	gray sandstone	
263	270	sandy Clay	
270	283	sandstone gravel & Clay	
283	297	Conglomeration	
297	350	sandy Clay	
350	374	black sandstone	
374	445	gray sandstone	
445	485	light gray sandstone	
485	500	brown soft sandstone some gravel	
500	585	blue clay	
585	600	black sandstone	
600	640	Clay & gravel cemented	
640	660	sandstone gray	
660	710	black sandstone	

Work started: 10/10/66
Work finished: 12/7/66

Well Driller's Statement: This well was drilled under my supervision and this report is true to the best of my knowledge.
Name: C. D. Beasley
Address: Burley Idaho
Signed by:
License No. 107 Date:

MSE

Millennium Science & Engineering, Inc.

WELL YIELD EVALUATION AND WATER SUPPLY RESOURCE ASSESSMENT

CITY OF ALBION, IDAHO

9 June 2004

Environmental Science and Engineering Solutions for the 21st Century

WELL YIELD EVALUATION AND WATER SUPPLY RESOURCE ASSESSMENT

CITY OF ALBION, IDAHO

9 June 2004

PREPARED FOR:

Galena Engineering, Inc.
PO Box 425
Ketchum, Idaho 83340

PREPARED BY:

Millennium Science & Engineering, Inc.
1605 North 13th Street
Boise, Idaho 83702
Tel. 208.345.8292
Fax. 208.344.8007

6-2

WELL YIELD EVALUATION AND WATER SUPPLY RESOURCE ASSESSMENT
City of Albion, Idaho
June 9, 2004

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INTRODUCTION

Millennium Science and Engineering, Inc. (MSE) was contracted by Galena Engineering, Inc. (Galena) of Hailey, Idaho, to assist with their assessment of the municipal water system for the City of Albion, Idaho. The volume of water delivered by the current system is sufficient for the non-irrigation season (late fall through early spring). However, the system is also used for irrigation by some of the connections that it serves and, during the late spring to early fall, the municipal system does not meet user demand. Galena specifically requested that MSE evaluate two options for increasing production to meet the peak demands placed on Albion's municipal water supply system:

- The potential to increase production from the city's existing water supply wells with a conservative estimate of the possible production pumping rates; and
- Conceptual design, feasibility and preliminary cost estimate for installation of a new well adjacent to the city's water storage reservoir.

BACKGROUND INFORMATION

Albion is located in the southeastern portion of Idaho, in Cassia County. The main town site is located in Township 12 south, Range 25 east, Section 6, at an approximate elevation of 4,730 feet (ft) above mean sea level (U.S. Geological Survey 1972). The population of Albion, Idaho was 262 in 2000 (U.S. Census Bureau 2004). The City of Albion manages a municipal water system which provides both drinking and irrigation water to its residents.

Three wells, located throughout Albion, currently supply water to the municipal water system. Well #1 (Park Well) is located in the city park near the southeast corner of the intersection of West North and Main Streets, at an elevation of approximately 4,720 ft above mean sea level. Well #2 (Vaughn/Whitman Street Well) is located near the northeast corner of the intersection of Vaughn and Whitman Streets, at an approximate elevation of 4,730 ft above mean sea level. Well #3 (Campus Well) is located near the northwest corner of town, on the former campus of the Albion Normal School, at an approximate elevation of 4,764 ft above mean sea level.

A 270,000-gallon, reinforced concrete reservoir is located approximately 1 mile west-northwest of town, in the southwest quarter of the southwest quarter of Section 36, Township 11 south, Range 24 east, at an approximate elevation of 4,960 ft above mean sea level (Idaho Department of Environmental Quality 2003). All three wells and the reservoir are connected directly to the water supply system. Each well is outfitted with a check valve to prevent water from flowing back down into the subsurface. When supply from the wells exceeds user demand, excess water flows through the delivery system into the reservoir. According to Mr. Stewart Waldemar, water supply system manager for the City of Albion, there are no booster pumps in the system to assist in moving water from the wells to the storage reservoir. Therefore, the pumps remove water from the wells and push it against the head of water in the delivery system and storage reservoir. The pumps are remotely controlled by telemetry based on the water level in the tank so that the pumps come on before the tank empties. During periods of low demand (late fall through early spring), Well #1 is used as the primary water supply and the other wells are available as backup. Mr. Waldemar indicated that all three pumps run almost continuously during the irrigation season.

LITERATURE RESEARCH AND DOCUMENT REVIEW

City of Albion Municipal Water Supply Wells

MSE and Galena investigated many potential sources for information regarding the City of Albion water supply system, well construction and pump configuration. MSE reviewed the following documents provided by Galena:

- *City of Albion (PWS 5160001) Source Water Assessment Final Report,* prepared by the Idaho Department of Environmental Quality (Idaho DEQ) in March, 2003 (Idaho DEQ 2003);
- *City of Albion Water Study,* prepared by Forsgren Associates, Inc., of Boise, Idaho (Forsgren), in 1991 (Forsgren 1991);
- Selected sections of *Pumping Plant Efficiency Evaluation, Albion Municipal Water Supply System, City of Albion, Idaho,* an open-file report prepared by the Idaho Department of Water Resources (IDWR) in 1983, included as an appendix in the above-referenced report by Forsgren (IDWR 1983);
- Well data for Well #2, Well #3 and Well #4 (no longer in use) provided by Pump Tech Company, Inc. of Idaho Falls, Idaho (Pump Tech), based on work they completed in 1992; and

- Well and pump configuration information provided by Layne Pumps, Inc. of Twin Falls, Idaho (Layne Pumps), based on work they completed in 2000.

MSE reviewed Well Driller's Reports on file at IDWR in Boise, Idaho to obtain information about subsurface water-bearing units and construction of the city's wells. During this review MSE obtained a copy of the "Report of Well Driller" for Well #2 and well driller's logs for several water supply wells in the vicinity of Albion, Idaho.

MSE requested additional well construction information from Ms. Helen Harrington, hydrogeologist for IDWR. Ms. Harrington indicated that she was not able to identify any additional information in IDWR files.

MSE contacted Mr. Scott Stanton and Mr. Robert Taylor of Idaho DEQ to obtain a well driller's log referenced in the above-mentioned Idaho DEQ source water assessment report (Idaho DEQ 2003). Mr. Taylor provided a general lithologic log for Well #1. The Well #1 lithologic log, Well #2 "Report of Well Driller" and information provided by Pump Tech and Layne Pumps are included in Appendix 1.

Mr. Stewart Waldemar provided narrative information about the Albion municipal water supply system and assisted MSE with field activities. Mr. Waldemar's comments have been incorporated throughout this report.

MSE has determined that little information is available regarding subsurface lithology, occurrence of subsurface water-bearing units and well construction for Well #1 and Well #3. Table 1 provides a summary of the well construction and pump information that MSE reviewed.

Table 1
Summary of Well Construction and Pump Information

	Well #1 (Park Well)	Well #2 (Vaughn/Whitman St. Well) [1]	Well #3 (Campus Well)
Construction Date	1939 [2]	1966	1910 [2]
Tota[redacted]	358 [4]	710	500+ [5]
Pum[redacted]	147 [6]	187.5 [5]	208.25 [5]
Casing Diameter: Depth (inches) (ft bgs)	15: 0 - 220 12: 220 - 358 [4]	16: 0 - 239 12: 239 - 492 10: 492 - 710	16: 0 - 500+ [5]
Screened Interval (ft bgs)	Unknown	110 - 258 492 - 700	Unknown
Pump Type	Submersible [6]	Vertical turbine [7]	Submersible [5]

Notes:
1. From Well #2 "Report of Well Driller", on file at IDWR (see Appendix 1), unless otherwise noted.
2. (Forsgren 1991).
3. ft bgs = feet below ground surface.
4. From Well #1 lithologic log provided by Idaho DEQ (see Appendix 1).
5. From well and pump information prepared by Pump Tech (see Appendix 1).
6. From well and pump information prepared by Layne Pumps (see Appendix 1).
7. Observed by MSE in the field.

Other Wells in the Vicinity of Albion, Idaho

MSE reviewed Well Driller's Reports on file at IDWR in Boise, Idaho to obtain information about subsurface water-bearing units and construction of the wells in the vicinity of Albion, Idaho. This information was used to develop a conceptual well design for the proposed well at the city's water storage reservoir. Well Driller's Reports for three wells listed in the same Township, Range and Section as the proposed well site and for one well at a similar elevation, but approximately 2 miles south of the proposed well site, were reviewed while developing the conceptual well design (discussed below).

FIELD ACTIVITIES

MSE performed aquifer pumping tests at Well #1 and Well #3, during March 10 through 12, 2004, to evaluate the potential yield from each of these wells. In preparation for this, the City of Albion installed flow meters, discharges to waste and valves at each well.

Well #1 (Park Well)

When MSE arrived in Albion, Well #1 was pumping and, according to Mr. Waldemar, had been the only well running for several months. Mr. Waldemar indicated that the pump had been operating approximately 4 to 6 hours per day for several months. The valve from the well was fully open and water was flowing from it at a rate of approximately 170 gallons per minute (gpm). Mr. Waldemar shut down the pump in Well #1 at approximately 5:00 pm on Wednesday, March 10 and reconfigured the pumps so that water was supplied to the municipal system from Well #3 (see below). The valves for Well #1 were adjusted so that the well discharged to waste.

On the morning of Thursday, March 11, MSE and Mr. Waldemar set up to perform a pumping aquifer test on Well #1. MSE measured a depth to water in Well #1 of 23.06 ft below top of casing (ft btoc) at approximately 10:00 am on March 11. A pressure transducer with attached data logger was lowered into the well as deep as possible. At this depth, the pressure transducer read a water level of approximately 110 ft of water above the transducer. The data logger was programmed to record the water level at 1-second intervals. A brief set up pumping test was performed to identify an appropriate flow rate and then the water level in Well #1 was allowed to recover.

The Well #1 pump was started at 1:39 pm on Thursday, March 11 and run continuously for 8 hours at a flow rate of approximately 260 gpm while the pressure transducer recorded water level measurements. The pump was shut off at 9:39 pm on March 11. The pressure transducer recorded water level recovery information overnight for approximately 13.5 hours. Data logging was terminated at 11:12 am on Friday, March 12 and the pressure transducer was removed from the well.

Once all aquifer test equipment was removed from the well, the discharge to waste valve was fully opened and the pump was turned on for approximately 2 minutes to evaluate maximum yield of the pump when discharging to the atmosphere. During this test, MSE measured a flow rate of approximately 510 gpm.

Well #2 (Vaughn/Whitman Street Well)

Due to the size and configuration of the Well #2 pump, MSE determined that it was not possible to lower a pressure transducer or water level meter probe into the well. Therefore, MSE did not perform an aquifer test at this well.

On the morning of Friday, March 12, MSE and Mr. Waldemar configured the pump to discharge to waste. The valve was fully opened and the pump was turned on for approximately 2 minutes to evaluate maximum yield of the pump when discharging to the atmosphere. During this test, MSE measured a flow rate of approximately 520 gpm. According to Mr. Waldemar, with the flow control valve fully open, this well produces approximately 285 gpm when connected to the water distribution system.

Well #3 (Campus Well)

When MSE arrived in Albion, the pump in Well #3 had not run for several months, according to Mr. Waldemar. On the afternoon of Wednesday, March 10, MSE and Mr. Waldemar set up to perform a step drawdown pumping aquifer test at Well #3. MSE measured a depth to water in Well #3 of 50.16 ft btoc at 1:27 pm. The valves for the well were adjusted so that the well discharged to waste.

A pressure transducer with attached data logger was lowered into the well as deep as possible. At this depth, the pressure transducer read a water level of approximately 63.5 ft of water above the transducer. The data logger was programmed to record the water level at 1-second intervals. A brief set up pumping test was performed to identify appropriate flow control valve settings and then the water level in the well was allowed to recover. During set up, MSE measured a maximum flow rate of approximately 240 gpm while the flow control valve was fully open and the pump was discharging to the atmosphere.

MSE performed a two-stage step-drawdown aquifer test on Well #3. The pump was started at 8:08 pm on Wednesday, March 10 and run for 1 hour at a flow rate of approximately 49 gpm. The pump was shut off at 9:08 pm on March 10 and the water level in Well #3 was allowed to recover for 1 hour. The pump was restarted at 10:08 pm on March 10 and it ran for 1 hour at a flow rate of approximately 142 gpm. The pump was shut off again at 11:08 pm and the water level in Well #3 was allowed to recover for 1.5 hours. The pressure transducer recorded water level measurements from the beginning of the first pumping period to the end of the final recovery period. Data logging was terminated at 12:39 am on Thursday, March 11 and the pressure transducer was removed from the well.

On the morning of Thursday, March 11, Mr. Waldemar configured the valves at Well #3 to supply water to the municipal water system while aquifer testing was performed on Well #1 over the next two days (see above). On March 11, at approximately 3:00 pm, MSE measured a flow rate of approximately 130 gpm with the flow control valve fully open while the pump was discharging to the water distribution system.

DATA ANALYSIS AND RESULTS

Water Level and Flow Rate Measurements

Water levels and flow rates recorded by MSE during aquifer testing activities are summarized in Table 2, below.

Table 2
Water Level and Flow Rate Measurements

	Well #1	Well #2	Well #3
Depth to Water: Pump Off (ft btoc) Date & Time	23.06 [1] 3/11/04 10:05am	Not Measured [2]	50.16 [3] 3/10/04 1:27pm
Max Depth to Water: Pumping (ft btoc) [4] Flow Rate (gpm) Date & Time	118.12 260 3/11/04 9:38pm	Not Measured [2]	102.10 142 3/10/04 11:00pm
Max Flow Rate: to Atmosphere (gpm) Date & Time	510 3/12/04 11:30am	520 3/12/04 11:57am	238 3/10/04 2:40pm
Max Flow Rate: to System (gpm) Date & Time	170 3/10/04 11:00am	285 [5] 6/1/04	130 3/11/04 2:50pm

Notes:
1. This datum was measured after the pump had been off for approximately 17 hours.
2. This parameter could not be measured due to inability to lower probes into well.
3. This datum was measured after the pump had been off for several months.
4. Calculated based on depth to water while pump was off and maximum drawdown recorded during aquifer pumping test.
5. This datum measured by Mr. Waldemar and provided by Mr. Choat.

Aquifer Test Analyses

The objective of the aquifer tests was to develop a conservative estimate of the maximum potential yield from each well. MSE analyzed the water level data collected during the aquifer tests of Well #1 and Well #3 using *Aqtesolv for Windows, Version 3.50*, a pumping aquifer test evaluation and modeling application developed by HydroSOLVE, Inc. of Reston, Virginia (HydroSOLVE, Inc. 2003). The analysis process involves matching type curves calculated from standard aquifer solutions based on ideal aquifer conditions to the water level data recorded during a pumping aquifer test. A variety of solutions is available. The preferred solution is the one that produces a type curve that most closely matches the observed data. Storativity (S) and transmissivity (T), two aquifer properties that affect drawdown in a pumped well, can be manipulated to adjust the type curve. Once the optimal storativity and transmissivity have been determined, one can project drawdown in a well under varying pumping rates.

The *Aqtesolv* evaluation requires information about the aquifer being tested and well construction. However, as noted above, little information was available regarding subsurface lithology and construction for Well #1 and Well #3. Therefore, MSE made assumptions regarding information necessary to analyze the aquifer test data. As directed by Galena, these assumptions are conservative (such that they would result in lower yield estimates). MSE has used our best professional judgment to make these assumptions, based on our previous experience with similar situations. MSE's assumptions that apply to aquifer tests and well yield estimates for both Well #1 and Well #3 are described below. *Aqtesolv* analysis information is included in Appendix 2.

- Aquifer is confined - This is a conservative assumption since drawdown is generally greater in confined aquifers than in unconfined ones for a given volume of water removed. This assumption is supported by the close fit of the confined aquifer type curves to drawdown data recorded during the aquifer tests. In addition, logs for surrounding wells suggest that there is a shallow unconfined aquifer in unconsolidated sediments in the area that is underlain by some clay layers over a deeper, partially confined sandstone aquifer.
- Well screen fully penetrates aquifer - This is a reasonable simplifying assumption given the incomplete information available regarding well construction and aquifer configuration.
- Aquifer is homogeneous and isotropic - This means that there are not preferential flow zones (such as fractures) within the aquifer and that vertical and horizontal flow is equal. This is a common simplifying assumption given the incomplete information available regarding aquifer configuration.
- Sandstone strata comprising aquifer are generally horizontal and laterally continuous - This is a simplifying assumption given the incomplete information available regarding aquifer configuration.

- Storativity = 0.00005 - Storativities in confined aquifers generally range from 0.005 to 0.00005 (Freeze and Cherry 1979). MSE evaluated each aquifer pumping test using both ends of this range of values and the smaller value was determined to provide the best fit to the observed data. Lower storativity values correlate to greater drawdown in a well (Freeze and Cherry 1979). Therefore, this is a conservative assumption that is reasonable based on available literature and results from these aquifer pumping tests.
- Continuous pumping at maximum production rate for 4 months - According to Mr. Mike Choat, of Galena, water meter records indicate that peak demand on the water supply system occurs from June through September.

Well #1 (Park Well)

MSE analyzed the recovery portion of the water level data collected during the aquifer test of Well #1 using the *Aqtesolv* software. In addition to those listed above, MSE made the following assumption in order to perform this analysis.

- Well is screened from 220 to 358 feet below ground surface (ft bgs) - This is based on the change in hole diameter at 220 ft bgs indicated on the Well #1 lithologic log included in Appendix 1.
- Acceptable maximum drawdown = 200 ft - This is based on the assumption that the well is screened from 220 to 358 ft bgs and is likely conservative. This drawdown will lower the potentiometric surface to the assumed top of the well screen.

The Theis solution for a confined aquifer most closely matched the recorded data. MSE used each of the two storativity end-points discussed above to find the corresponding transmissivities for Well #1. The results of Well #1 recovery data analysis are summarized in Table 3. Based on the fit of the type curve to the observed data, the transmissivity of 673.7 square feet per day (ft^2/day), which corresponds with a storativity of 0.00005, seems the most reasonable value.

Table 3
Summary of Well #1 Aquifer Properties

Storativity	Resulting Transmissivity (ft^2/day)
0.005	468.4
0.00005	673.7

The water level data recorded during the pumping portion of the test performed on Well #1 was analyzed with the *Aqtesolv* software to confirm the results presented above. When storativity was set to 0.00005, the resulting transmissivity that produced a type curve that most closely matched the observed data was 673.8 ft^2/day. This agrees with the analysis of the recovery portion of the test. The data from the recovery portion of a pumping aquifer test conducted on a single well are generally more reliable than the data from the pumping portion. Therefore, MSE used the aquifer properties from the water level recovery analysis to project future yield for Well #1.

MSE used the reasonable transmissivity value of 673.7 ft^2/day, derived from the recovery data (see Table 3) and the storativity of 0.00005 to project drawdown in Well #1 under various pumping rates. MSE projected a maximum production rate for Well #1 of approximately 395 gpm. This pumping rate would result in a drawdown of approximately 200 ft after pumping continuously for 4 months. Given the static water level of 23.06 ft bgs measured at Well #1 (see Table 2), this pumping rate would result in a pumping water level of approximately 220 ft bgs. The results of the projected maximum production rate for Well #1 are presented in Table 4. Appendix 2 includes figures produced by *Aqtesolv* for this analysis. The early drawdown (first 8 hours) predicted by *Aqtesolv* reasonably agrees with observations made during our aquifer test. This limited calibration of the *Aqtesolv* model supports the drawdown projected by the model after 4 months of continuous pumping.

Table 4
Projected Maximum Production Rate for Well #1

Measured Static Water Level (ft bgs)	Storativity	Transmissivity (ft^2/day)	Production Rate (gpm)	Estimated Drawdown (ft)	Estimated Pumping Water Level (ft bgs)
23.06	0.00005	673.7	395	198	221.06

Well #3 (Campus Well)

MSE analyzed the water level data collected during the two-stage step-drawdown aquifer pumping test of Well #3 using the *Aqtesolv* software. In addition to those listed above, MSE made the following assumption in order to perform this analysis.

- Total well depth is greater than 500 ft - This is supported by the information provided by Pump Tech (see Appendix 1).

- Acceptable maximum drawdown = 200 ft - This is based on the assumption that the aquifer is generally horizontal and laterally continuous (see above) and that the assumed top of the screened interval for Well #1 is the assumed top of the aquifer.

The Theis solution for a confined aquifer most closely matched the recorded data. MSE used each of the two storativity end-points discussed above to find the corresponding transmissivities for Well #3. The results of Well #3 step drawdown data analysis are summarized in Table 5. Based on the fit of the type curve to the observed data, the transmissivity of 581.7 ft^2/day, which corresponds with a storativity of 0.00005, seems the most reasonable value.

Table 5
Summary of Well #3 Aquifer Properties

Storativity	Resulting Transmissivity (ft^2/day)
0.005	354.8
0.00005	581.7

MSE used the reasonable transmissivity value of 581.7 ft^2/day and the storativity of 0.00005 to project drawdown in Well #3 under various pumping rates. MSE projected a maximum production rate for Well #3 of 350 gpm. This pumping rate would result in a drawdown of approximately 200 ft after pumping continuously for 4 months. Given the static water level of 50.16 ft bgs measured at Well #3 (see Table 2), this pumping rate would result in a pumping water level of approximately 250 ft bgs. The results of the projected maximum production rate for Well #3 are presented in Table 6. Appendix 2 includes figures produced by *Aqtesolv* for this analysis. The drawdown predicted by *Aqtesolv* reasonably agrees with observations made during the step-drawdown aquifer pumping test.

Table 6
Projected Maximum Production Rate for Well #3

Measured Static Water Level (ft bgs)	Storativity	Transmissivity (ft^2/day)	Production Rate (gpm)	Estimated Drawdown (ft)	Estimated Pumping Water Level (ft bgs)
50.16	0.00005	581.7	350	199	249.16

Conceptual Design of Proposed Well at Storage Reservoir

As directed by Galena, MSE developed a conceptual design for a new water supply well to be located in the vicinity of the storage reservoir. Galena indicated that the new well should be capable of meeting the peak demand of 500 gpm for 4 months. MSE used *Aqtesolv* to project drawdown in the proposed well based on the results of the aquifer test analyses conducted on the nearby city wells. To accomplish this, MSE made the same assumptions used in our earlier analyses (see above) and those described below.

- <u>Transmissivity = 519.65 ft^2/day</u> - This is the average of the four transmissivity values obtained from analysis of the aquifer tests conducted on Well #1 and Well #3 (See Tables 3 and 5, above). Given the lack of information available for the area of the proposed well, including the lower (more conservative) transmissivity values in this average is appropriate.
- <u>Desired yield = 500 gpm for 4 months</u> - This is the yield requested by Galena.
- <u>Effective well radius is 12 inches</u> - This is the optimal well diameter for the desired well yield (Driscoll 1986).

The resulting drawdown predicted in the proposed well by *Aqtesolve* is approximately 320 ft after 4 months of continuous pumping at a rate of 500 gpm. The results of this *Aqtesolv* projection are included in Appendix 2.

Well Driller's Reports for existing wells in the same Township, Range and Section as the proposed well site provide conflicting indications of probable depth to water at the proposed well site. Therefore, MSE estimated the depth to water by calculating a hydraulic gradient of approximately 49 feet per mile (ft/mi) between the non-pumping water levels measured in Well #1 and Well #3. MSE then projected that gradient up to the location of the storage reservoir. The resulting estimated depth to static water level is approximately 200 ft bgs in the vicinity of the reservoir. Based on this estimated depth to static water level and the projected drawdown of 320 ft, the pumping water level would be approximately 520 ft bgs. MSE proposes a total well depth of 700 ft bgs to be conservative and allow for increased future production. This proposal is based on the assumption that the lower extent of the aquifer is at least 700 ft bgs.

MSE's conceptual design for the proposed well at the storage reservoir, based on the projected pumping water level, is summarized below. A diagram of the conceptual well design is included in Appendix 3. The final well design must meet Idaho Rules for Public Drinking Water Systems (IDAPA 58.01.08) and will require approval from Idaho DEQ.

- Total well depth = 700 ft - This is intended to be conservative and should allow for increased production in the future, if necessary.
- Casing diameter at pump = 1 ft - This is the optimum diameter for the desired yield of 500 gpm (Driscoll 1986)
- Screened interval = 200 ft - This screened interval is designed to be capable of producing more than the desired 500 gpm and should be sufficient if several narrow water producing zones are encountered instead of a thicker continuous one. The screen may be split into discrete sections at more productive zones, depending on observations made during drilling.
- 2-inch thick annular seal to approximately 60 ft bgs - This is the standard stated in the Idaho Rules for Public Drinking Water Systems (IDAPA 58.01.08). A deeper seal may be warranted by conditions encountered during drilling.

MSE obtained a preliminary estimate from Kodiak Drilling Company of Declo, Idaho (Kodiak) to install a public water supply well according to MSE's preliminary design. Kodiak estimates a cost of approximately $76,020. See Appendix 3 for the driller's preliminary cost estimate. MSE estimates the following additional costs:

- Design, oversight, regulatory coordination and testing..$25,000
- Contingency due to uncertainty of drilling conditions and completion methods...........20%

Our estimates do not include costs for pumps, piping, real estate acquisition or pump building.

MSE's conceptual design for the proposed well at the storage reservoir is appropriate for a well installed in relatively consolidated formations. Due to their locations, the wells for which MSE reviewed IDWR Well Driller's Reports do not provide detailed information regarding subsurface lithology in the immediate vicinity of the proposed well site. Some Well Driller's Reports for wells in the vicinity of Albion, Idaho, indicate that it is sometimes necessary to telescope successively smaller diameter casing at depth to prevent sloughing of poorly consolidated formations into the borehole. The cost of constructing such a well is higher than the cost for MSE's conceptual design because more casing is required. MSE also obtained a preliminary cost estimate of approximately $82,995 from Kodiak for drilling and installation of a well with telescoping casing.

DISCUSSION

As discussed above, Galena requested that MSE evaluate the two following options for increasing production to meet the peak demands placed on Albion's municipal water supply system:

- The potential to increase production from the city's existing water supply wells with a conservative estimate of the possible production rates; and
- Conceptual design, feasibility and preliminary cost estimate for installation of a new well adjacent to the city's water storage reservoir.

Increasing Production in Existing Water Supply Wells

Based on MSE's analysis of the aquifer pumping test data from Well #1 and Well #3, production from these wells could likely be increased considerably during the 4 month period of peak demand without significant negative impact to the aquifer. Accomplishing this under the current conditions of the municipal water system would require: installing more a powerful pump in each well; and lowering the pumps in both wells. MSE did not research the availability of pumps that would be capable of the projected production rates presented above and would fit into the existing wells.

There are many unknown factors about the wells included in this study and the feasibility of increasing projection from the existing wells is based on MSE's assumptions about some of these factors. Therefore, prior to making any long-term or costly changes to the pumps in the existing wells, MSE recommends the following:

- Obtaining more complete information regarding well construction - this could be partially accomplished with equipment such as a down-well video camera; and
- Performing longer-term pumping tests at the desired production rates to determine if nearby wells are negatively impacted.

Installing New Well at Storage Reservoir

MSE's drawdown projections and conceptual design for the proposed well at the storage reservoir are based on many assumptions about and estimations of the hydrogeology in the vicinity of the proposed well site. These assumptions are based on our review of the available information and our best professional judgment. However, correlation between existing wells and the proposed well site is complicated by the complex hydrogeology of the area. Therefore, the final appropriate well design may differ from the conceptual design presented in this report. Certain well design details, such as total depth and screened intervals, may require modification based on actual conditions observed in the field. Field observations may include performing an aquifer test on the open boring at an intermediate depth to confirm aquifer production characteristics.

The Idaho Rules for Public Drinking Water Systems (IDAPA 58.01.08) include several additional requirements for constructing new public water system wells. Some of these are discussed below.

- Well site evaluation and approval - Prior to well installation, sites and designs for public water supply wells must be approved by Idaho DEQ. Obtaining such approval requires preparation of a site evaluation (including items described in Idaho DEQ's Well Site Evaluation checklist); arranging for a site visit by an Idaho DEQ representative; and obtaining Idaho DEQ approval of the final well design.
- Pumping aquifer test - Prior to connection to the system, a pumping aquifer test must be performed on the new well at a production rate similar to the projected well yield.
- Water system approval – Approval for the design and construction of all other parts of the water supply system, including the well house, piping, valves and treatment facilities must be obtained from Idaho DEQ prior to serving water users from the system.

LIMITATIONS AND RESTRICTIONS

To achieve the study objectives stated in this report, we were required to base our conclusions on the best information available during the period of the investigation and within the limits prescribed by our client in the agreement.

No investigative method can completely eliminate the possibility of obtaining partially imprecise or incomplete information. Thus, we cannot guarantee that the investigations completely defined the characteristics of the water supply that was tested. Professional judgment was exercised in gathering and analyzing the information obtained, and we commit ourselves to the usual care, thoroughness, and competence of the engineering profession.

As directed by Galena, all cost estimates and designs proposed in this report are conceptual and subject to change based on actual observations and conditions encountered during engineering and construction activities.

As agreed, the scope of this report is limited to the matters expressly covered herein. This report has been prepared for the exclusive use of Galena Engineering, Inc. MSE represents within the parameters established by the agreed upon scope of work, this work has been undertaken and performed in a professional manner, in accordance with generally accepted practices, and using the degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, either expressed or implied, is made.

Prepared by:	Reviewed by:
Starr Marea Johnson, P.G.	Paul K. Hunter, P.G.
Project Geologist	Office Manager

REGISTERED PROFESSIONAL GEOLOGIST
Starr Marea Johnson
1038
STATE OF IDAHO
10/8/04

r1467b FINAL Galena-Albion Water Supply Eval.doc

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IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY

TRANSMITTAL COVER SHEET

FAX NUMBER (208) 373-0143
THIRD FLOOR, TECHNICAL SERVICES

DATE: 3-23-04

TO: Stas Johnson - HSE

PHONE: 345-8292

FAX: 344-8007

FROM: Robert Taylor

PHONE: 373-0319

FAX: 208-373-0143

DOCUMENT DESCRIPTION:

Albion Well #1 log

TOTAL NUMBER OF PAGES (INCLUDING THIS COVER SHEET): 2

IF YOU DO NOT RECEIVE ENTIRE FAX CALL: (208) 373-0193

COMMENTS:

FAX.FRM

6-22

RECEIVED
DEC 15 1992
...OF
...TAL QUALITY
... OFFICE

ALBION WELL

[redacted]

DESCRIPTION

1 to 15--Clay

15 to 21-- Gravel With water

21 to 44-- Yellow clay

44 to 72-- Yellow sand rock- little water on top of rock

72 to 120-- Gray sand rock

120 to 135-- Gravel and boulders

135 to 145-- Gray sand rock

145 to 220-- Mixture of ~~B######~~ Lime Rock-end-of 15 inch hole.

220 to 244-- Gray sand rock with 12 inch hole-

244 to 252-- Gravel

252 to 256-- Lava (blakk)

256 to 270-- Gravel

270 to 280-- Sand rock (Gray)

280 to284-- Porus sand rock with a little water

284 to 330-- Gravel

330 to 334-- Black sand rock and fine gravel

334 to 354-- Black sand rock

354 to 358-- Black sand # with some water-

****

750 gal a minute
Drawdown on pump 66'
Water raise to within 11' of surface

G-23

RECEIVED
AUG 9 1968
Department of Reclamation

REPORT OF WELL DRILLER
State of Idaho

State law requires that this report shall be filed with the State Reclamation Engineer within 30 days after completion or abandonment of the well.

WELL OWNER:
Name Village of Albion
Address Albion, Idaho

Owner's Permit No. [illegible]
NATURE OF WORK (check): Replacement well ☐
New well ☑ Deepened ☐ Abandoned ☐

Water is to be used for: ____

METHOD OF CONSTRUCTION: Rotary ☐ Cable ☐
Dug ☐ Other ____ (explain)

CASING SCHEDULE: Threaded ☐ Welded ☐
20 "Diam. from 0 ft. to 82 ft.
16 "Diam. from 0 ft. to 258 ft.
12 "Diam. from 239 ft. to 500 ft.
10 "Diam. from 402 ft. to 710 ft.
Thickness of casing: ____ Material:
Steel ☐ concrete ☐ wood ☐ other ☐
____ (explain)

PERFORATED? Yes ☑ No ☐ Type of perforator used: mills knife [illegible]
Size of perforations: ____ " by ____ "
[illegible] perforations from 110 ft. to 239 ft.
perforations from 250 ft. to 258 ft.
[illegible] perforations from 402 ft. to 700 ft.
perforations from ____ ft. to ____ ft.

WAS SCREEN INSTALLED? Yes ☐ No ☐
Manufacturer's name ____
Type ____ Model No. ____
Diam. ____ Slot size ____ Set from ____ ft. to ____ ft.
Diam. ____ Slot size ____ Set from ____ ft. to ____ ft.

CONSTRUCTION: Well gravel packed? Yes ☐ No. ☐ size of gravel ____ placed from ____ ft. to ____ ft. Surface seal provided? Yes ☑ No ☐ To what depth? 82 ft. Material used in seal: 20" [illegible] [illegible]

Did any strata contain unusable water? Yes ☐ No. ☐ Type of water: ____
Depth of strata ____ ft. Method of sealing strata off: ____

Surface casing used? Yes ☐ No. ☐
Cemented in place? Yes ☐ No ☐

Locate well in section

	Sec.		

LOCATION OF WELL: County Cassia
[illegible] NW ¼ Sec. 6 T. 13 N/S R. 24 E/W

Size of drilled hole: 20 Total depth of well: 710 Standing water level below ground: 127.9' Temp. Fahr. ____ ° Test delivery: ____ gpm or ____ cfs Pump? ☐ Bail ☐
Size of pump and motor used to make test: ____
Length of time of test: ____ Hrs. ____ Min.
Drawdown: ____ ft. Artesian pressure: ft. above land surface ____ Give flow ____ cfs or ____ gpm. Shutoff pressure: ____
Controlled by: Valve ☐ Cap ☐ Plug ☐
No control ☐ Does well leak around casing? Yes ☐ No ☐

DEPTH FROM FEET	TO FEET	MATERIAL	WATER YES OR NO
0	5	sand	
5	22	Boulders	
22	34	Clay	
34	45	Clay & Boulders	
45	90	Brown sandstone	
90	135	Grey sandstone	
135	143	[illegible]	
143	149	Sand & Clay	
149	175	Grey sandstone	
175	185	[illegible]	
185	262	grey sandstone	
262	270	Sandy Clay	
270	283	sand & gravel & Clay	
283	297	[illegible]	
297	350	sandy Clay	
350	374	[illegible] sandstone	
374	445	[illegible] sandstone	
445	485	light grey sandstone	
485	500	[illegible] soft sandstone	
		[illegible]	
500	555	Blue Clay	
555	600	Black sandstone	
600	640	Clay & gravel sand [illegible]	
640	660	sandstone gray	
660	710	black sandstone	

Work started: [illegible]
Work finished: [illegible]
Well Driller's Statement: This well was drilled under my supervision and this report is true to the best of my knowledge.
Name: [illegible]
Address: Burley, Idaho
Signed by: ____
License No. 107 Date: ____

[illegible] south & [illegible] east of [illegible] building

Use other side for additional remarks

USGS

[illegible] 24

GALENA ENGINEERING, INC.

CIVIL ENGINEERS AND LAND SURVEYORS

FAX TRANSMITTAL COVER SHEET

DATE: 3-1-04

PROJECT NO. & NAME:

SUBJECT: Albion

TO: Stan

FAX NUMBER: 344-8007

Number of Pages (including this cover sheet): 3

FAX only X Original to follow in mail

If this transmission is illegible or incomplete, please call our office at (208) 726-4729. Our fax number is (208) 726-4783.

Stan,

Attached is info I got on wells 2-4. Layne in Twin Falls is sending me data on #1. I will get that info to you also. The mayor wants us to start work anytime. I will call you about your timing.

Thanks

FROM: Mike Chad

DISTRIBUTION:

9-25

PUMP TECH COMPANY, INC.
4444 So. Yellowstone Hwy.
P.O. Box 51250
Idaho Falls, Idaho 83405
Phone (208) 529-8868
FAX (208) 529-4332

Oct. 19, 1992

CITY OF ALBION
P.O. BOX 147
ALBION, ID 83311

ATTN: Rick Dunn
SUBJ: Well Data

Dear Mr. Dunn,

During the past several months we have repaired and/or modified Well #2, Well #3 and Well #4 for the City of Albion. Following is a description of the wells after the work has been completed.

* **WELL #2** *

Horse Power:	40 HP
Pump Setting:	187' - 6" x 1 3/16"
Bowl Assy:	American Turbine 10H60 7stg
Flow:	350 GPM
Total Head:	310' (90 psi above ground)
Alt Flow:	480 GPM
Alt Total Head:	260' (70 psi above ground)
Well Size:	20" Casing
Well Depth:	700 + feet
Static Water Level:	38'
Estimated Pumping Level:	100'

* **WELL #3** * (SUBMERSIBLE)

Horse Power:	20 HP
Pump Setting:	208' - 3"
Bowl Assy:	Jacuzzi 8" 4stg
Flow:	220 GPM
Total Head:	285' (70 psi above ground)
Alt Flow:	180 GPM
Alt Total Head:	330' (90 psi above ground)
Well Size:	16"
Well Depth:	500 + feet
Static Water Level:	44'
Estimated Pumping Level:	125'

G-26

* WELL #4 *

Horse Power:	25 HP
Pump Setting:	185'
Bowl Assy:	American Turbine 8L300 11stg
Flow:	220 GPM
Total Head:	340' (90 psi above ground)
Well Size:	16"
Well Depth:	187'
Static Water Level:	52'
Pumping Level:	185'

Note Well #4 had a well test performed. We found the maximum flow to be 70 - 100 GPM at 185' plumbing level. While this pump is capable of pumping 220 GPM it must be restricted to pump only 70 - 100 GPM or maximum well capacity. The pump was sized for larger capacity to accommodate future well production.

If you have any questions or comments, please contact me.

Sincerely,

D. Barry Cazier
President,
PumpTech Company, Inc.

Send pump curve!

STARK 3[illegible]4-8007

I think this is for well #1

Layne PUMPS, Inc.

P.O. Box 640
Twin Falls, Idaho 83303-0640

Telephone (208) 733-3284

FAX 208-423-5137

FACSIMILE TRANSMITTAL FORM

TO Mike Chont

DATE 3/1/04

Fax # 726-4783

SUBJECT Albion Pumps

TOTAL PAGES INCLUDING COVER SHEET

I found information on 3 pumps.

The 8L12 - 5 stage is a short coupled pump that we worked on in 5/93, but did not originally install.

The Peerless 7LB - 9 stage we worked on in 4/88.

I think that we replaced the 7LB with the 7CLC - 3 stage in 6/00.

The only well information I have is the 7CLC - 3 stage. I have no well or pump numbers other than what is written

Thanks

By: Launa

G-28

LAYNE PUMPS
Box 640, Twin Falls, Idaho 83301
Phone: 208-733-3284
Fax: 208-423-9137

PUMP ESTIMATE AND ORDER

ORDER NO. ______ DATE 3/1 2004

DEALER

CUSTOMER
City of Albion
pump information as of
5/20/93

Route ______ Date Desired ______

PUMPING CONDITIONS

Inside Dia. of ~~Well~~ sump ______
Depth of Well ______
Static Water Level ______
Drawdown ______
Lift in Well ______
Lift Above ______ Lbs. ______
Column Friction ______
Total Dynm. Head ______
Capacity ______ GPM
Speed of Pump ______ RPM
HP Required ______
Allowable Shaft HP ______

Number	DESCRIPTION	LIST PRICE	NET PRICE
	______ HP MOTOR ______ Phase ______ Volt ______ Make ______ RPM		
	{With / Without} Ratchet ______		
	______ HEAD ______ " Outlet ______ {Water Lub / Oil Lub}		
	OILER ______ Volt Solenoid		
	______ "X ______ "DISCHARGE NIPPLE {TOE / TBE}		
5'8"	SETTING OF 4 "X 1 "X WL in. ______ Length		
8	"BOWLS L12 Type 5 Stage {Open / Close} Ports {Bronze / Cast Iron} Wear Rings		
	{Bronze / Cast Iron} Impellers {Oversize / Standard} Shaft Fitted ______ X ______ X ______ X ______		
	______ "X ______ " SUCTION {TOE / TBE} ______ Couplings		
8	"STRAINER {Bronze / Galvanized} {Screwed / Welded} {Basket / Cone}		
	reconditioned 5/20/93		
	TOTAL		

Quoted By Launa

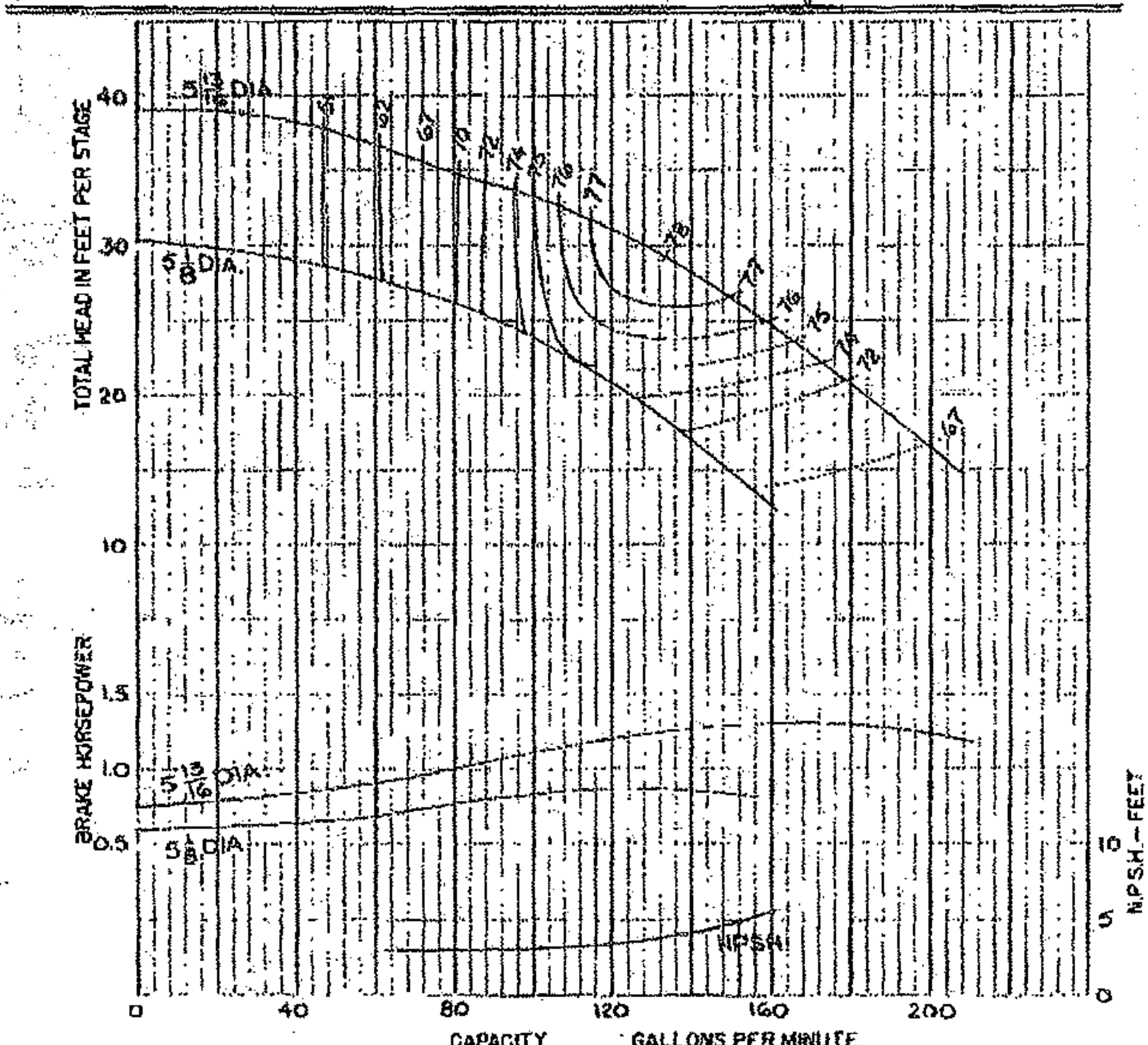
[redacted]

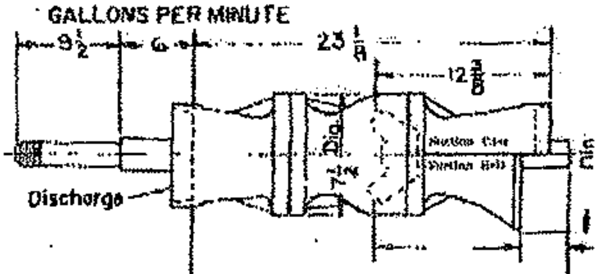
208-423-9137 p.02

G-29

RATING CURVES
(60 CYCLE)

8L-12
1760 RPM





For additional stages add $5\frac{5}{8}$ per stage.

Efficiency shown is for 7 stages or more, with standard materials. For fewer stages or other materials change efficiency as shown.

No. of stages	Eff. change	MATERIAL	Eff. change	Standard materials					
				Impeller — bronze					
				Bowl — cast iron / enamelled					
6	-.5	Impeller - bronze	—	Thrust factor	3.1				
5	-.75	Impeller - c.i.	-1	Rotor wt. per stage (lbs.)	10				
4	-1	Impeller - c.i. enm.	+2	Bowl wt. 1st stage (lbs.)	80				
3	-2	Bowl - c.i. enm.	—	Bowl wt. add'l. stage (lbs.)	40				
2	-3.5	Bowl - cast iron	-3.5	Max. bowl horsepower	80	Impeller shaft diameter	1.25	Column pipe	4
1	-5	Bowl — bronze	-3	Impeller eye area (sq. in.)	4.7	Minimum impeller shaft end play	.438	Suction pipe	4

Section 140
10-74

[redacted]

Peerless Pump

LAYNE PUMPS
Box 840, Twin Falls, Idaho 83301
Phone: 208-733-3284
Fax: 208-423-5137

ORDER NO. ____________

PUMP ESTIMATE AND ORDER

DATE 3/1 20 04

DEALER

Route ________ Date Desired ________

CUSTOMER

City of Albion
pump information aprx. 1/12/83
Peerless S/N 463167

PUMPING CONDITIONS

Inside Dia. of Well 12"
Depth of Well ____
Static Water Level ____
Drawdown ____
Lift in Well ____
Lift Above ____ Lbs.
Column Friction ____
Total Dynam. Head ____
Capacity ____ GPM
Speed of Pump ____ RPM
HP Required ____
Allowable Shaft HP ____

Number	DESCRIPTION	LIST PRICE	NET PRICE
	25 HP MOTOR ____ Phase ____ Volt ____ Make ____ RPM		
	{With / Without} Rachet		
	HEAD ____ " Outlet ____ {Water Lub / Oil Lub}		
	OILER ____ Volt Solenoid		
	"X ____ " DISCHARGE NIPPLE {TOE / TBE}		
	115 SETTING OF 6 "X 1 "X W/L " in ____ ' Length		
	7 "BOWLS LB Type 9 Stage {Open / Close} Pump {Bronze / Cast Iron} Wear Rings		
	{Bronze / Cast Iron} Impellers {Ocrable / Standard} Shaft Fitted ____ X ____ X ____ X ____		
	"X ____ " SUCTION {TOE / TBE} ____ " ____ Couplings		
	"STRAINER {Brass / Galvanized} {Screwed / Welded} {Basket / Cone}		
	impellers are fully trimmed		
	TOTAL		

Quoted By ____________

[redacted] [redacted]

G-31

LAYNE PUMPS
Box 640, Twin Falls, Idaho 83301
Phone: 208-733-3284
Fax: 208-423-5137

ORDER NO. ____________

PUMP ESTIMATE AND ORDER

DATE 3/1 2004

DEALER

CUSTOMER
City of Albion - well & pump information 10 from 10/30/00

Route ________ Date Desired ________

PUMPING CONDITIONS

Inside Dia. of Well	12"	Lift in Well		Capacity	300 GPM
Depth of Well	900+	Lift Above ___ Lbs.		Speed of Pump	3450 RPM
Static Water Level	40'	Column Friction		HP Required	
Drawdown		Total Dynm. Head	250'	Allowable Shaft HP	

Number	[redacted]	LIST PRICE	[redacted]
	30 HP MOTOR 3 Phase 460 Volt 6" Franklin Submersible Make 3600 RPM		
	{With / Without} Ratchet		
	5" X 12" HEAD ___ Outlet ___ {Waterss & Oil Tub}		
	OILER ___ Volt Solenoid		
	"X ___ "DISCHARGE NIPPLE {TOE / TBE}		
	147' SETTING OF ___ "X ___ "X ___ " in ___ "Length		
	7 "BOWLS CLC Type 3 Stage {Open / Closed} Ports {Bronze / Cast Iron} Wear Rings		
	{Bronze / Cast Iron} Impellers {Oversize / Standard} Shaft Fitted ___ X ___ X ___ X		
	"X ___ "SUCTION {TOE / TBE} ___ Couplings		
	"STRAINER {Bronze / Galvanized} {Screwed / Welded} {Basket / Cone}		
	3 impellers are trimmed to 4.9375		
	TOTAL		

Quoted By Dawna

6-32

LAYNE PUMPS, INC.
LAYNE PUMPS, INC

Goulds Turbine Pump Selection ver 0.00a
00/07/00

PUMP DATA SHEET
Goulds Turbine 60 Hz

Selection file: (untitled)
Catalog: TURB60.MPC v 1.4.5

[redacted]

[redacted]

Design Point: Flow: 350 US gpm
Head: 240 ft

Temperature: 60 °F
SG: 1
Viscosity: 1.122 cP
Vapor pressure: 0.2508 psi_a
Atm pressure: 14.7 psi_a

Pump: TURBINE - 3600 Size: 7CLC (3 stages)
Speed: 3450 rpm Dia: 4.9375 in

Limits: Temperature: --- °F Sphere size: 0.43 in
Pressure: 416 psi_g Power: --- bhp

NPSHa: --- ft

Specific Speed: Ns: 2183 Nss: ---

Piping: System: - -
Suction: --- in
Discharge: --- in

Dimensions: Suction: 5 in Discharge: 5 in

Vertical Turbine: Bowl Dia: 7.13 in Max Lateral: 0.5 in
Thrust K Factor: 3.6

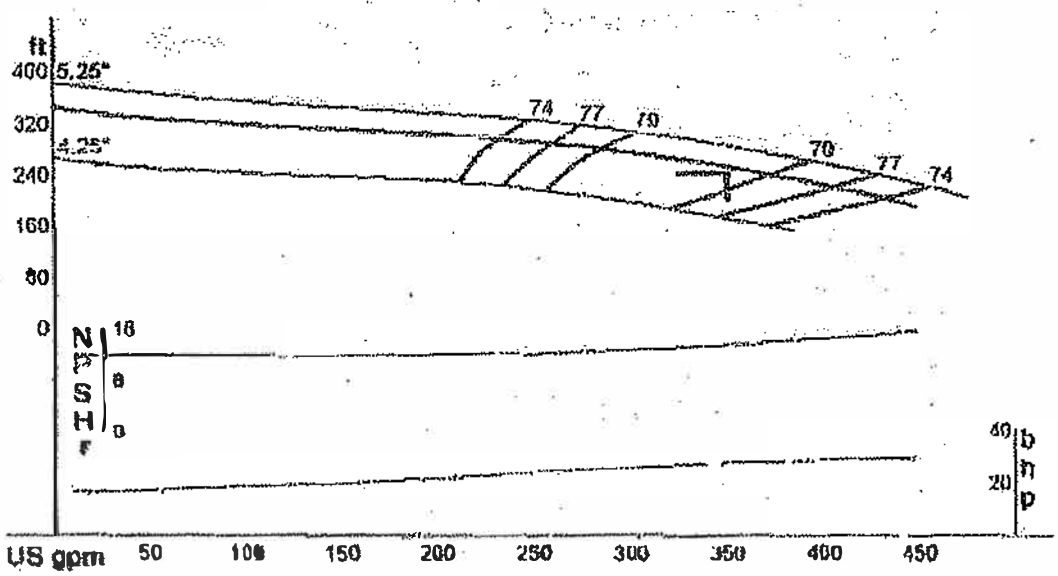
Motor: 30 hp Speed: 3600 Frame: 286TS
NEMA Standard TEFC Enclosure
sized for Max Power on Design Curve

6" Disch dia also avail.

--- Data Point ---
Flow: 350 US gpm
Head: 250 ft
Eff: 79.4%
Power: 27.8 bhp
NPSHr: 13.5 ft

-- Design Curve --
Shutoff Head: 345 ft
Pressure: 149 psi_g
Min Flow: - US gpm
BEP: 79.8% eff
@ 334 US gpm
NOL Pwr: 29.7 bhp
@ 432 US gpm

-- Max Curve --
Max Pwr: 34.1 bhp
@ 456 US gpm



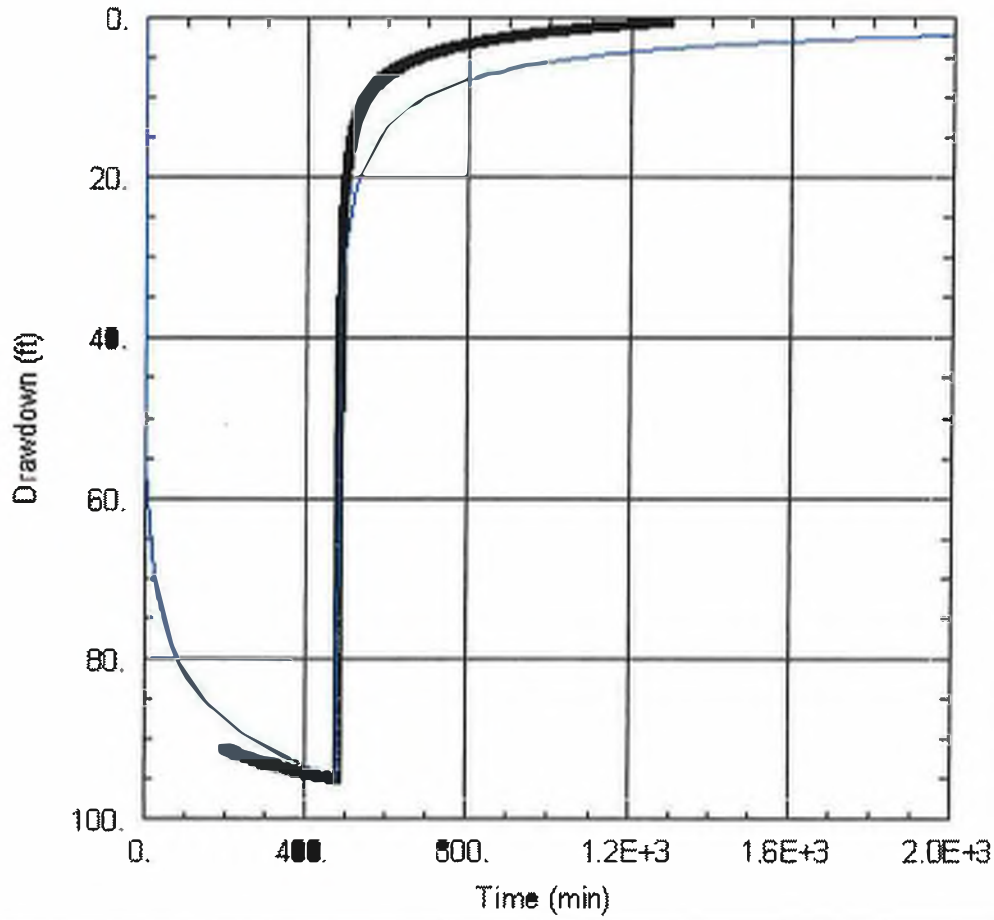
--- PERFORMANCE EVALUATION ---

Flow US gpm	Speed rpm	Head ft	Pump %eff	Power bhp	NPSHr ft	Motor %eff	Motor hp	Hrs/yr	Cost /kW
420	3450	209	75.3	29.4	14.8				
350	3450	250	79.4	27.8	13.5				
280	3450	281	78.6	25.2	12.4				
210	3450	300	70	22.6	12				
140	3450	313	54	20.1	12				

[redacted]

[redacted]

G-33



WELL #1 PUMP & RECOVERY TEST

Data Set:
Date: 05/[illegible]3/04 Time: 15:03:35

PROJECT INFORMATION

Company: MSE
Client: Galena Engineering, Inc.
Project: B2411
Location: Albion, Idaho
Test Well: Well #1
Test Date: 11 - 12 March 2004

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Well #1	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
▫ Well #1	0	0

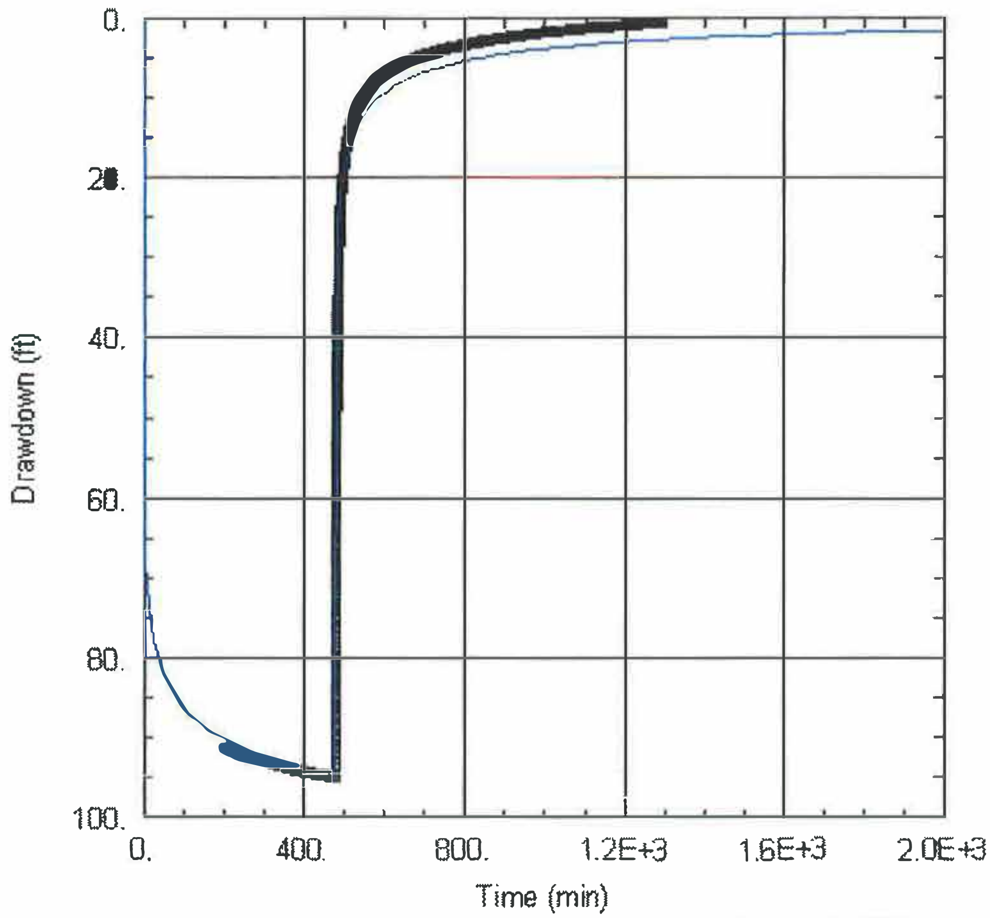
SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 468.4 ft^2/day
Kz/Kr = 1.

S = 0.005
b = 138. ft

6-35



WELL #1 PUMP & RECOVERY TEST

Data Set:
Date: 05/03/04

Time: 15:05:31

PROJECT INFORMATION

Company: MSE
Client: Galena Engineering, Inc.
Project: B2411
Location: Albion, Idaho
Test Well: Well #1
Test Date: 11 - 12 March 2004

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Well #1	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
Well #1	0	0

SOLUTION

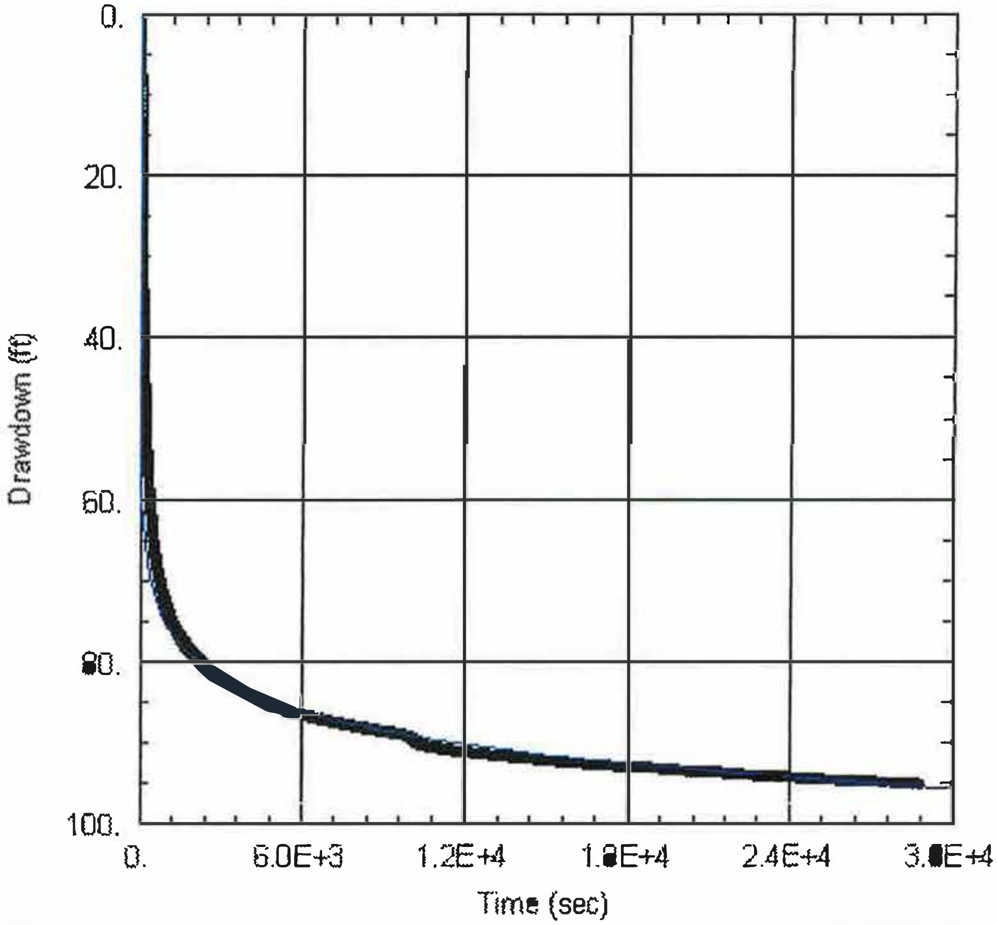
Aquifer Model: Confined

Solution Method: Theis

T = 673.7 ft^2/day
Kz/Kr = 1.

S = 5.0E-5
b = 138. ft

G-34



WELL #1 PUMP TEST - PUMPING PORTION

Data Set:
Date: 05/03/04 Time: 13:05:12

PROJECT INFORMATION

Company: MSE
Client: Galena Engineering, Inc.
Project: B2411
Location: Albion, ID
Test Well: Well #1
Test Date: 11 - 12 March 2004

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Well #1	0	0

Observation Wells

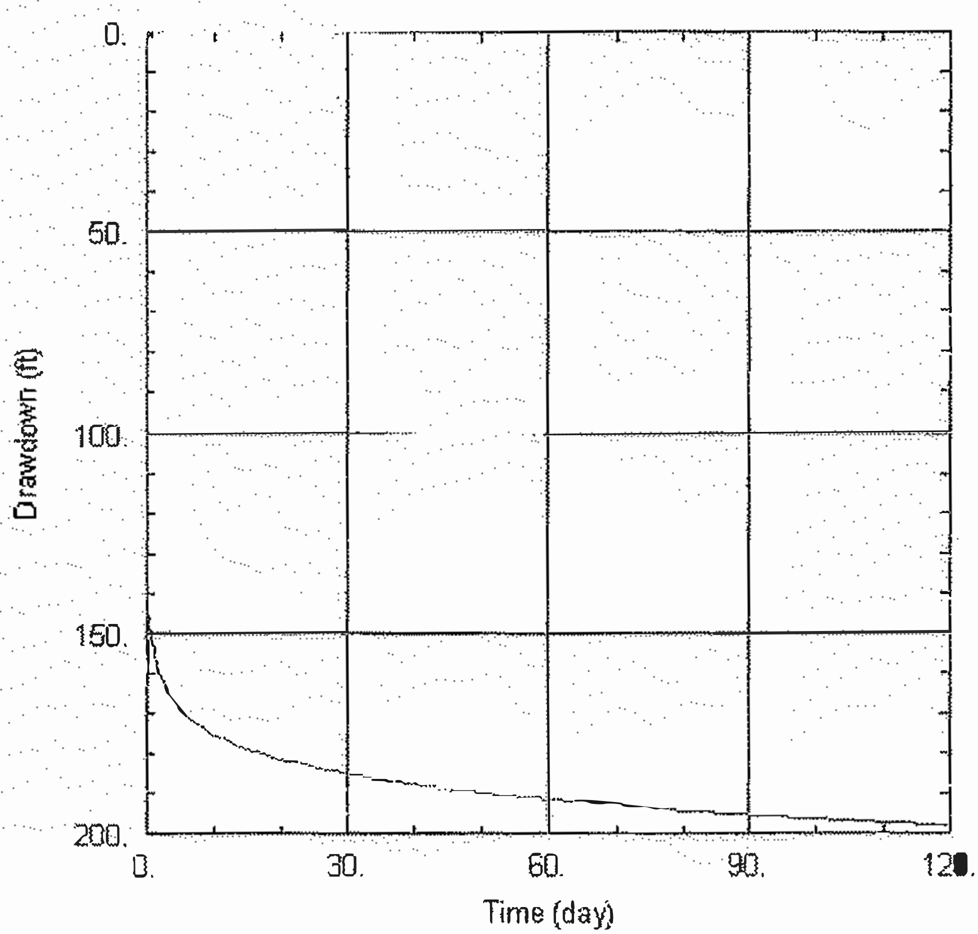
Well Name	X (ft)	Y (ft)
▫ Well #1	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 673.8 ft^2/day
S = 5.[illegible]E-5
Kz/Kr = 1.
b = 138. ft

G-37



WELL #1 - MOST REASONABLE PROJECTION - 395 GPM

Data Set:
Date: 05/25/04 Time: 10:19:33

PROJECT INFORMATION

Company: MSE
Client: Galena Engineering, Inc.
Project: [illegible]2411
Location: Albion, Idaho
Test Well: Well #1
Test Date: 11 - 12 March 2004

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Well #1	0	0

Observation Wells

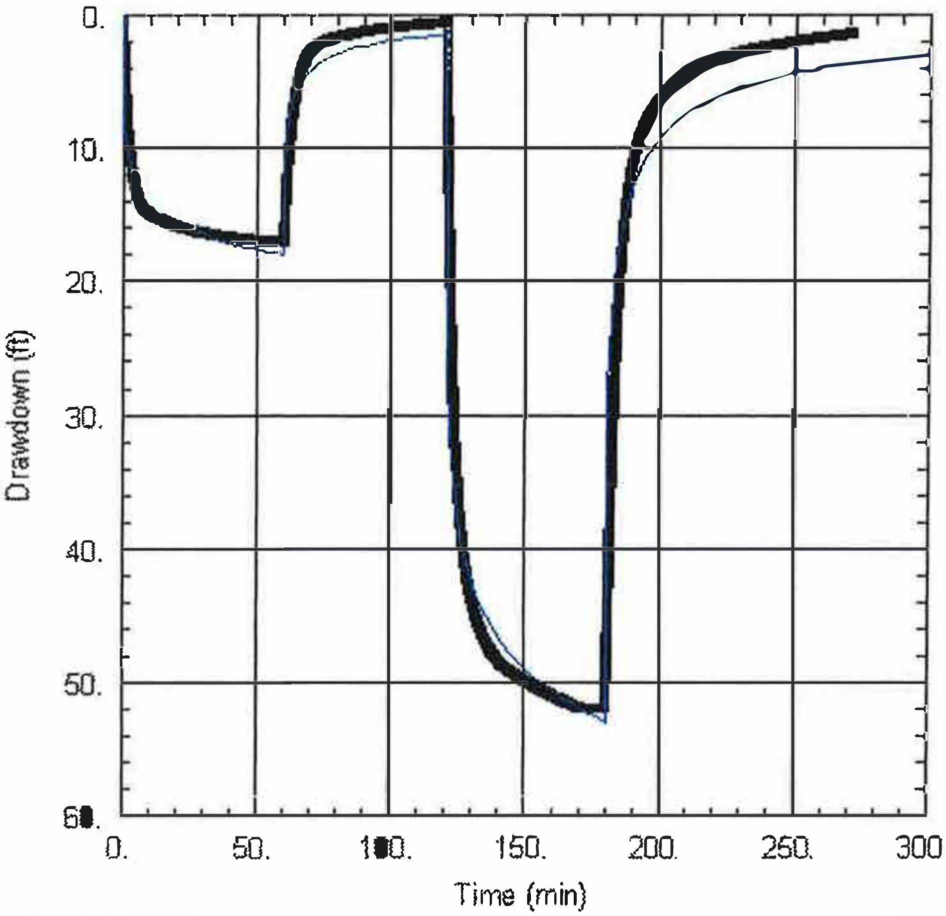
Well Name	X (ft)	Y (ft)
▫ Well #1	0	0

SOLUTION

Aquifer Model: Confined Solution Method: Theis

T = 673.7 ft²/day S = 5.0E-5
Kz/Kr = 1. b = 138. ft

G439



WELL #3 STEP DRAWDOWN TEST

Data Set:
Date: 05/03/04 Time: 15:11:32

PROJECT INFORMATION

Company: MSE
Client: Galena Engineering, Inc.
Project: B2411
Location: Albion, Idaho
Test Well: Well #3
Test Date: 10 - 11 March 2004

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Well #3	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
▫ Well #3	0	0

SOLUTION

Aquifer Model: Confined

Solution Method: Theis

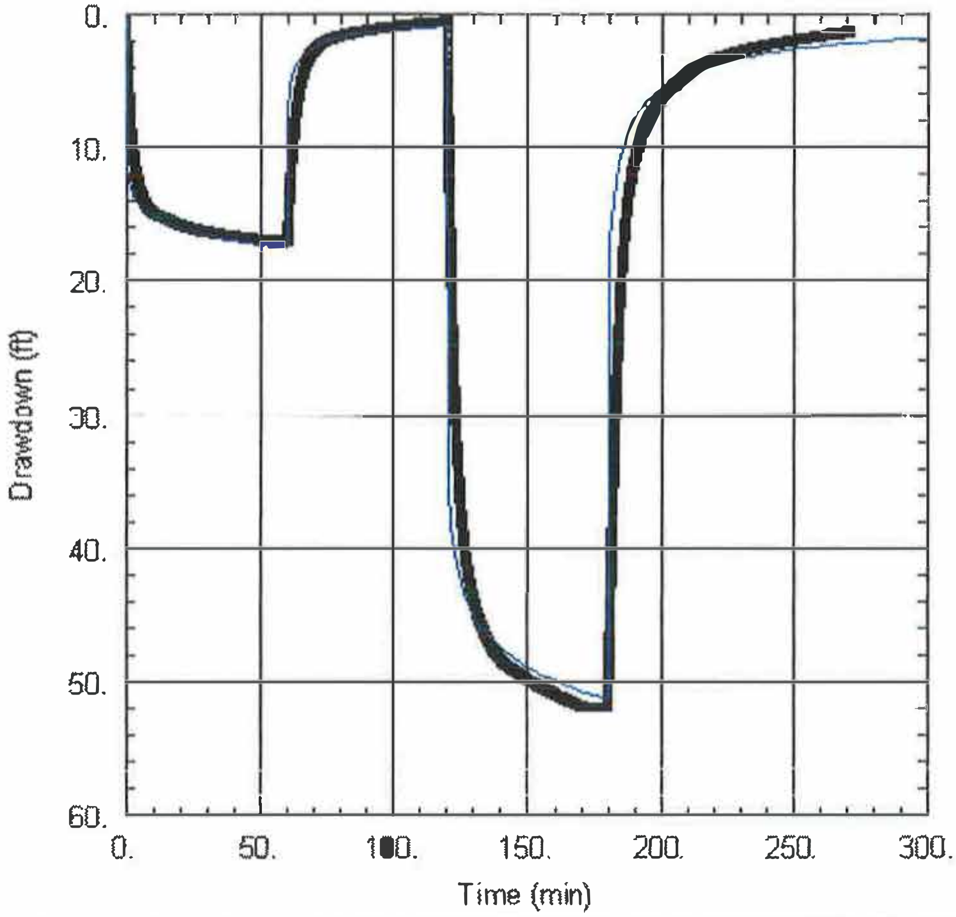
T = 354.8 ft^2/day

Kz/Kr = 1.

S = 0.005

b = 100. ft

G-40



WELL #3 STEP DRAWDOWN TEST

Data Set:
Date: 05/03/04 Time: 15:12:52

PROJECT INFORMATION

Company: MSE
Client: Galena Engineering, Inc.
Project: B2411
Location: Albion, Idaho
Test Well: Well #3
Test Date: 10 - 11 March 2004

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Well #3	0	0

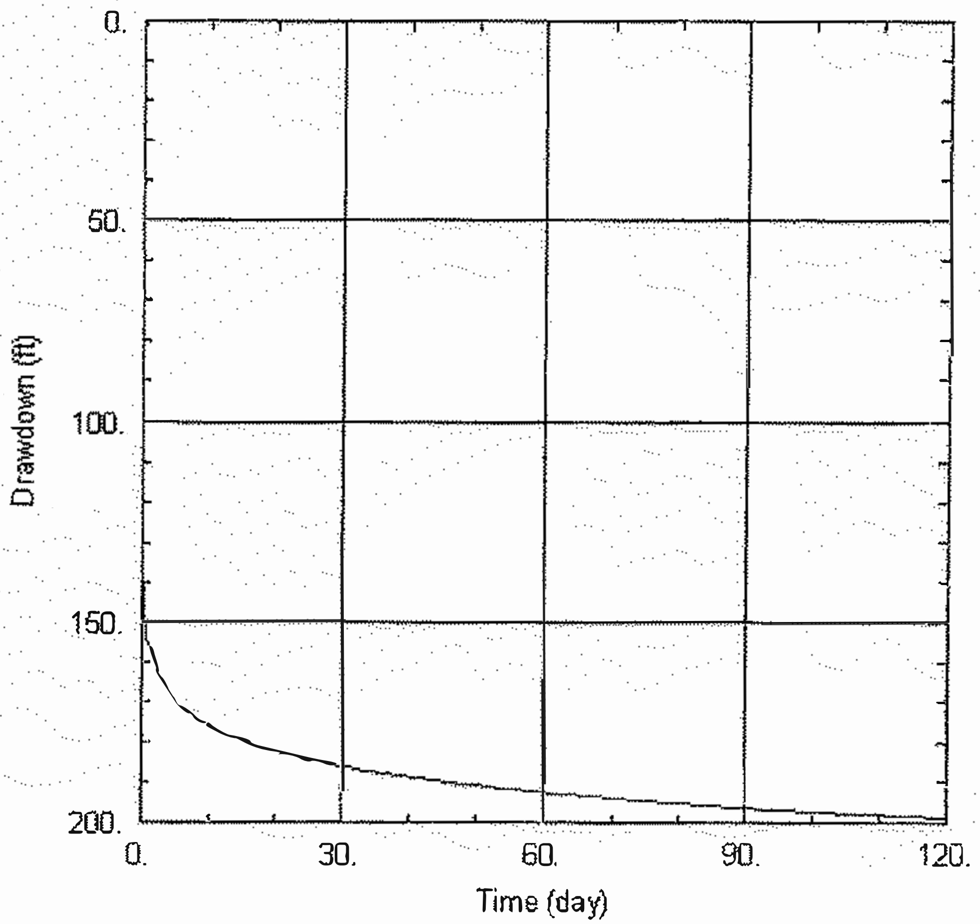
Observation Wells

Well Name	X (ft)	Y (ft)
▫ Well #3	0	0

SOLUTION

Aquifer Model: Confined
Solution Method: Theis

T = 581.7 ft^2/day
S = 5.0E-5
Kz/Kr = 1.
b = 100. ft



WELL #3 - MOST REASONABLE PROJECTION - 350 GPM

Data Set:
Date: 05/25/04

Time: 13:05:32

PROJECT INFORMATION

Company: MSE
Client: Galena Engineering, Inc.
Project: B2411
Location: Albion, Idaho
Test Well: Well #3
Test Date: 10 - 11 March 2004

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
Well #3	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
▫ Well #3	0	0

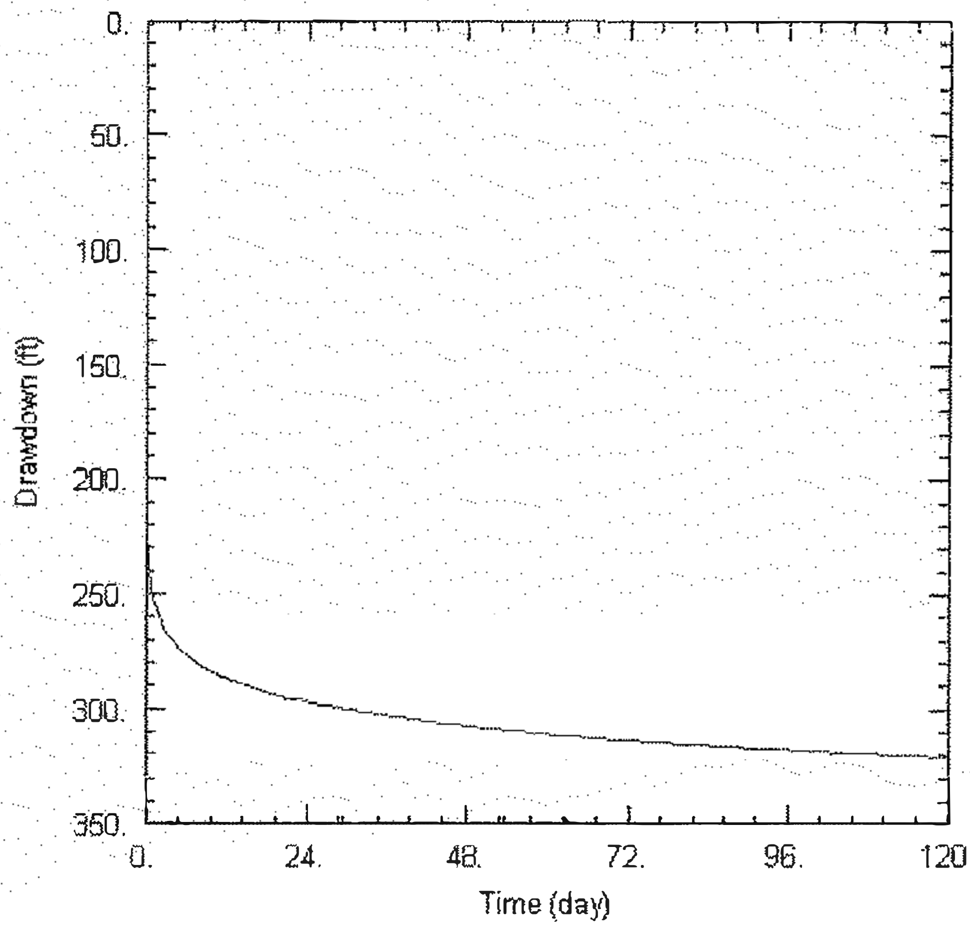
SOLUTION

Aquifer Model: Confined

Solution Method: Theis

T = 581.7 ft^2/day
Kz/Kr = 1.

S = 5.0E-5
b = 138. ft



PROPOSED WELL AT RESERVOIR - FORWARD PROJECTION - 500 GPM

Data Set:
Date: 05/17/04 Time: 15:31:47

PROJECT INFORMATION

Company: MSE
Client: Galena Engineering, Inc.
Project: B2411
Location: Albion, Idaho
Test Well: Reservoir Well
Test Date: 10 - 12 March 2004

WELL DATA

Pumping Wells

Well Name	X (ft)	Y (ft)
ReservoirPW	0	0

Observation Wells

Well Name	X (ft)	Y (ft)
▫ ReservoirPW	0	0

SOLUTION

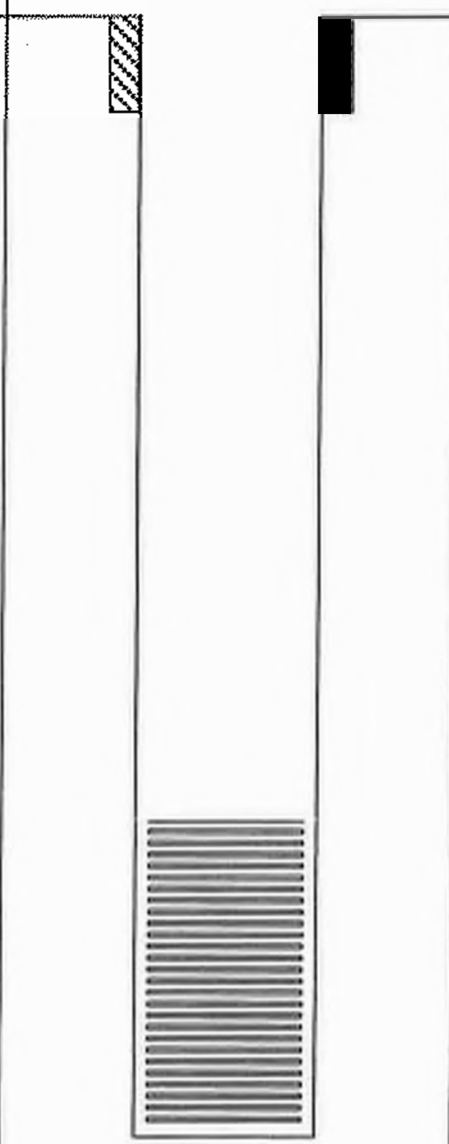
Aquifer Model: Confined
Solution Method: Theis

T = 519.6 ft^2/day
S = 5.0E-5
Kz/Kr = 1.
b = 500. ft

G-43

MSE Millennium Science & Engineering, Inc.

CONCEPTUAL WELL DESIGN DIAGRAM

Depth (ft)	Casing Description	Well Completion Diagram	Seal/Packing Description
-50, 0, 50, 100, 150, 200, 250, 300, 350, 400, 450, 500, 550, 600, 650, 700, 750	12-inch internal diameter, 0.375-inch thick steel casing from 1 ft above to 500 ft below ground surface. 12-inch internal diameter, 0375-inch thick steel casing perforated from 500 to 700 feet below ground surface. Note: Perforations should be placed in sections at more productive zones, as observed during drilling.		2-inch thick annular seal from ground surface to at least 60 ft below ground surface. Actual total depth should be based on observations made during drilling.

Project: Galena Engineering / Albion Water Supply

Project #: B2411

Address: SW 1/4, SW 1/4, Sec 36, T 11 S, R 24 E

City, State: Albion, Idaho

Well ID: Reservoir Well - Preliminary

Drilling Method: Air Rotary

Outside Diameter: 16" to 60 ft bgs; 12" to 700 ft bgs

Total Depth: 700 ft

Prepared for
Millennium Science & Engineering, Inc.
Attn: Starr Johnson
1605 N 13th St
Boise, ID 83702

Prepared by
Kodiak Drilling Co
Winston Inouye
152 S 950 E
Declo, ID 83323

Starr Johnson,

Based on our evaluation of the lithologic characteristics of the area in which the well is to be drilled, we believe that scenario A would probably be most cost effective. We estimate that the porosity values of the materials likely to be encountered will be in the 35% to 37% range. We feel that torch perforated casing will provide the transmission necessary for adequate volume.

We have also included scenario B that contains all the elements and per unit prices of a more complex multi diameter well with continuous slot well screens. Total amounts of any given element could vary significantly in proportion. We do feel that this estimate will provide a reasonable assumption for the maximum financial exp0osure in this particular scenario.

Our geological consultant feels that igneous formations will not be encountered in the described location, as such no remedies have been considered for the possibility. However, in the event that consolidated igneous formations were encountered, the financial exposure would likely not exceed those provided in the current estimates.

Winston Inouye
Kodiak Drilling Co

G-47

ESTIMATE

KODIAK DRILLING CO.
152 S. 950 E.
DECLO, ID 83323

Phone: 208-654-2807
Cellular: 208-431-2807

Date: 5/25/04

To: Millenium Science & Engineering, Inc
c/o Starr Johnson
1605 N 13th St
Boise, ID. 83702

Scenario A

DESCRIPTION	UNIT PRICE	AMOUNT
60' of drilling 16" hole	80.00/ft	4800.00
60' of 16" .250 Wall temporary casing	40.00/ft	2400.00
16" driveshoe		1,000.00
700' of 12" .375 wall casing	40.00/ft	28,000.00
640' of drilling 12" hole	55.00/ft	35,200.00
12" driveshoe		600.00
40 hrs labor @ $90/hr	90.00/hr	3600.00
35 sacks bentonite	12.00/sk	420.00

Thank You

Total 76,020.00

The foregoing is an estimate only. All drilling equipment, casing, pipe, materials and labor shall be furnished by the company. The price or prices stated in this estimate are based on prices for component materials, labor and freight in effect as of the date of this estimate. If at any time prior to the completion or performance of the work to be performed under this proposal, any of such material prices, labor rates, or freight rates shall be increased, there shall be a corresponding increase in the prices stated in this proposal. In the event the work should, before completion, be delayed by igneous or mineralized rock, defective soil, adverse weather or act of God, then the loss occasioned by such event or happening shall be sustained solely by the owner. When drilling is completed or discontinued, owner shall pay in full the costs of drilling and all materials used, regardless of whether water is found. The size of the drill hole may be enlarged or reduced if formations should be encountered which make such modifications necessary. Owner agrees to pay in cash in full on completion of the well and presentment of a final statement of the amount due by company. Owner further agrees that all accounts are due and payable in full upon completion of the work and presentment of a statement showing the amount due. Owner further agrees that a FINANCE CHARGE of 1¾% per month which corresponds to a nominal ANNUAL PERCENTAGE RATE of 21% will be applied to all past due accounts. Company reserves the right to file a lien on all accounts thirty (30) days past due as allowed by law.

Agreed to and accepted by Owner on the following date: ____________________

____
Authorized signature of owner

ESTIMATE

KODIAK DRILLING CO.
152 S. 950 E.
DECLO, ID 83323

Phone: 208-654-2807
Cellular: 208-431-2807

Date: 5/25/04

To: Millenium Science & Engineering, Inc

Scenario B

DESCRIPTION	UNIT PRICE	AMOUNT
60' of drilling 16" hole	80.00/ft	4800.00
60' of 16" casing .250 wall	40.00/ft	2400.00
300' of 12" casing .375 wall	40.00/ft	12000.00
300' of drilling 12" hole	55.00/ft	16500.00
50' 12" screen	810.00/10 ft	4050.00
200' of 10" casing .312 wall	30.00/ft	6000.00
200' of 10" drilling	40.00/ft	8000.00
50' of 10" screen	610.00/10 ft	3050.00
200' of 8" casing .312 wall	25.00/ft	5000.00
200' of 8" drilling	35.00/ft	7000.00
50' of 8" screen	455.00/10 ft	2275.00
80 hrs labor	90.00/hr	7200.00
35 sacks bentonite	12.00/sk.	420.00
16" driveshoe		1000.00
12" driveshoe		600.00
10" driveshoe		450.00
8" driveshoe		250.00

Thank You

Total 82,995.00

The foregoing is an estimate only. All drilling equipment, casing, pipe, materials and labor shall be furnished by the company. The price or prices stated in this estimate are based on prices for component materials, labor and freight in effect as of the date of this estimate. If at any time prior to the completion or performance of the work to be performed under this proposal, any of such material prices, labor rates, or freight rates shall be increased, there shall be a corresponding increase in the prices stated in this proposal. In the event the work should, before completion, be delayed by igneous or mineralized rock, defective soil, adverse weather or act of God, then the loss occasioned by such event or happening shall be sustained solely by the owner. When drilling is completed or discontinued, owner shall pay in full the costs of drilling and all materials used, regardless of whether water is found. The size of the drill hole may be enlarged or reduced if formations should be encountered which make such modifications necessary. Owner agrees to pay in cash in full on completion of the well and presentment of a final statement of the amount due by company. Owner further agrees that all accounts are due and payable in full upon completion of the work and presentment of a statement showing the amount due. Owner further agrees that a FINANCE CHARGE of 1¾% per month which corresponds to a nominal ANNUAL PERCENTAGE RATE of 21% will be applied to all past due accounts. Company reserves the right to file a lien on all accounts thirty (30) days past due as allowed by law.

Agreed to and accepted by Owner on the following date: ______________________

____
Authorized signature of owner

APPENDIX D: WATER QUALITY DATA

- Source Water Assessment
- Source Water Protection Plan
- EPA Drinking Water Quality Standards
- Monitoring Schedule
- Violation History Report 2020
- Sampling History Report
- Report of past violations/enforcement actions dating back to 1980
- Sanitary Survey

Source Water Assessment Summary Report: ALBION CITY OF (PWS# ID5160001) WELL #1 E0007566

Introduc on

Source water is untreated ground water (aquifers and springs) and surface waters (rivers, streams, and lakes) used to supply drinking water for public water systems. In Idaho there are approximately 1,960 public water systems providing water to almost 1.5 million people. The US Environmental Protection Agency (EPA) requires the Idaho Department of Environmental Quality (DEQ) to assess every public water system source (well, spring, or surface water intake) in Idaho for its relative susceptibility to contaminants that are regulated by the federal Safe Drinking Water Act. There are approximately 3,500 active sources in Idaho. DEQ conducts source water assessments based on an inventory of potential contaminants and land uses within the delineated source water assessment area, construction of the well, sensitivity factors associated with the drinking water source, and local aquifer characteristics. The ultimate goal of each source water assessment is to provide data that communities can use to develop protection strategies for their drinking water sources (source water protection).

The resources and time available to accomplish source water assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water system is not possible. Instead, DEQ uses computer databases and geographic information system (GIS) maps to produce a potential contaminant inventory that can then be verified by the system or other stakeholders with an on-the-ground investigation. If any additional potential contaminants are identified, the system can create a potential contaminant enhanced inventory.

The results of source water assessments should not be used as an absolute measure of risk, nor should they be used to undermine public confidence in the public water system. A particular susceptibility score does not imply any regulatory or safety violations exist or contamination will occur. This report summarizes information about public water systems in Idaho. Using or distributing the data in this report in any other form may inaccurately portray the data.

DEQ strongly encourages each public water system and community to use its source water assessments, combined with local knowledge and concerns, to develop source water protection strategies. Multiple resources are available to help communities implement source water protection programs, including DEQ's Source Water Protection Activity Guide and Source Water Protection Plan Template.

The protection of source water involves many partners. Various governmental entities and organizations play a role in protecting drinking water sources in Idaho and can be a resource for protection efforts. Source water protection activities should be coordinated with these entities to leverage resources and maximize results. For example, activities related to agricultural practices should be coordinated with the Idaho State Department of Agriculture, Idaho Soil and Water Conservation Commission, local Soil and Water Conservation District, and Natural Resources Conservation Service. Visit the Idaho Source Water Collaborative website for more information on potential partners and resources.

For assistance in developing protection strategies, contact DEQ's Twin Falls Regional Office or the Idaho Rural Water Association.

This report was completed March 26, 2003. Potential contaminant information was updated on December 18, 2019. Confirmed detections noted in the susceptibility report were updated January 2019 for community and NTNC sources active at the time of the update. (This could result in a change to a source's final susceptibility ranking.)

What Was Assessed

This report evaluates ALBION CITY OF (PWS# ID5160001) WELL #1 E0007566 located in CASSIA county. The system serves approximately 310 people through 151 connections.

Defining the Source Water Assessment Area

The first step of a source water assessment is to delineate the source water assessment area. The delineation process includes mapping the boundaries of the land area above the aquifer that could contribute water and potential pollutants to the water supply. The delineation illustrates the portion of the aquifer that supplies water to the well. Depending on the type of public water system (i.e., community, nontransient noncommunity, or transient noncommunity) and the amount of site-specific data available, one of three methods may be used to delineate a ground water source: (1) a fixed 1,000 foot radius, (2) a calculated fixed radius, or (3) a refined analytical method.

For community systems that serve at least 15 service connections or 25 people year-round in their primary residences (e.g., most cities and towns, apartments, and mobile home parks with their own water supplies) or nontransient noncommunity systems that serve at least 25 of the same persons over 6 months per year (e.g., schools, churches, nursing homes, and factories, and hospitals with their own water source), DEQ uses a refined analytical method approved by EPA to delineate up to three separate time-of-travel (TOT) zones.

The TOT zones illustrate the number of years necessary for a particle of water or contaminant to move from a specific point in the aquifer to the well. The refined analytical method uses site-specific data assimilated from a variety of sources, including well logs and hydrogeologic reports to determine the TOT zones. DEQ may use a calculated fixed radius method for community and nontransient noncommunity systems when site-specific data are not available. Generalized, existing, hydrogeologic data from the major aquifer types in Idaho, and data from the well pump rate are used in the average velocity equation to derive radii for 3-, 6-, and 10-year TOT zones.

The following three TOT zones are mapped:

Zone I refers to the 0-3 TOT zone and is addressed by two subzones: Zone 1A and Zone 1B.

> Zone IA refers to the sanitary setback, or the 50-foot radius around the well. The goal of this zone is to prevent contamination from nearby sources, particularly microbial contamination from sewer lines, livestock, surface waters, and septic systems.
>
> Zone IB refers to the 0–3 year TOT zone. Water in this zone takes 0–3 years to travel in the aquifer to reach the well.

Zone II refers to the 3–6 year TOT zone. Water in this zone takes 3–6 years to travel in the aquifer to reach the well.

Zone III refers to the 6–10 year TOT zone. Water in this zone takes 6–10 years to travel in the aquifer to reach the well.

The source water assessment for WELL #1 was done using the Refined Analytical Method and is illustrated in the map provided. The data used to determine the source water assessment delineation for WELL #1 are included in the References section or available from DEQ upon request.

Suscep bility Analysis

The susceptibility analysis provides an estimate of the likelihood that the water supply will become contaminated. For each well, spring, or surface water intake in a public water system, susceptibility to contamination is scored as high, moderate, or low. Susceptibility scores for wells take into account three factors, which are described in more detail in later sections:

1. System Construction: Construction of the well being assessed.
2. Hydrologic Sensitivity: Hydrologic and geologic conditions surrounding the well.
3. Potential Contaminant Inventory(PCI)/Land Use: Potentially significant sources of contamination and land uses within the delineated source water assessment area.

Each of the factors listed above receives a score of high, medium, or low to reflect how susceptible the source is to potential contamination. Note that deriving susceptibility scores is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgment. Once completed, susceptibility scores are only updated upon request by the public water system.

PCI/land use scores and final susceptibility scores consist of four individual scores, one for each of four categories of contaminants:

Inorganic chemicals (IOC)

Volatile organic chemicals (VOC)

Synthetic organic chemicals (SOC)

Microbial contaminants

High susceptibility to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The susceptibility scores for WELL #1 are shown in the table below. Click here for full susceptibility score details.

Susceptibility Scores for ALBION CITY OF (PWS# ID5160001) WELL #1 E0007566									
System Construction	Potential Contaminant Inventory / Land Use				Hydrologic Sensitivity	Final Susceptibility Ranking			
	IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
M	H	H	H	H	M	High	Moderate	Moderate	Moderate
H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility. System Construction refers to the well, spring, or surface water intake.									
Auto High - see below.*			Report Date: 3/26/2003			Click for Map		Click for details	

***Auto-High Score:** Four situations cause automatic assignment of a high susceptibility score: (1) any detection of a VOC or SOC, (2) detection of an IOC at a concentration greater than the drinking water maximum contaminant level (MCL) set by EPA, (3) a confirmed microbial detection at the drinking water source, or (4) the presence of potential contaminant sources within 50 feet of a well. Additionally, ground water sources designated as under the direct influence of surface water (GWUDI) automatically rank high for microbial contaminants due to the inherent nature of surface water bodies as wildlife habitat and residence for various microorganisms. Any of the first three situations will trigger an auto-high score because a pathway for contamination already exists. Note that MCLs, detections, and potential contaminants can change over time and are not automatically updated in the score. Refer to the susceptibility score details page for more information on the contaminant source or detections resulting in an auto-high score.

System Construction Score

The first of the three factors scored in a source water assessment is the system construction. System construction refers to the construction of the well that serves as the drinking water source. The construction of a well directly affects its ability to protect the aquifer from contaminants. System construction scores are lower when information shows that the design and integrity of the well can help prevent potential contaminants from reaching the aquifer. The system construction score depends on these five components:

1. Compliance with all current construction standards for public water system wells.
2. Condition of the wellhead and surface seal.
3. Placement of the well casing and annular seal into or through at least one continuous low permeability geologic unit of substantial thickness (≥10 feet) reduces the risk of contamination to the aquifer. (Permeability is the ability of a porous medium, such as rock, sediment, and soil, to transmit fluids under a hydraulic gradient; it is a measure of the relative ease of fluid flow under unequal pressure.)
4. Production of water from more than 100-feet below static water level. (Static water level refers to the level of water in a well under normal, no-pumping conditions.) Water drawn from deeper portions of an aquifer is typically buffered from most potential contaminants introduced at the land surface.
5. Location of the well outside of a 100-year floodplain. (A floodplain is flat or nearly flat land along a river or stream or in a tidal area that is covered by water during a flood. The 100-year floodplain is the area likely to be inundated during a flood with a 1% chance of being equaled or exceeded in any given year. DEQ uses data from the Federal Emergency Management Agency to determine the 100-year floodplain for any given area.) Locating wells outside a floodplain can help prevent direct contact between the wellhead and storm, flood, or irrigation water.

Idaho Department of Water Resources' rules regulate well construction ("Well Construction Standards Rules" [IDAPA 37.03.09]). These rules require all public water systems to also follow DEQ's well construction standards ("Idaho Rules for Public Drinking Water Systems" [IDAPA 58.01.08.510]). DEQ standards include screening requirements, depth of annular seal, use of a down-turned casing vent, and casing thickness, height, and depth. Current construction standards for public water system wells can be more stringent than standards in effect when a well was constructed, so your system construction score may be higher due to not meeting current well construction standards.

Your system construction score may also be higher if adequate information about the well is not available. Refer to the susceptibility score details page for more information about the construction of the well assessed in this report.

Hydrologic Sensitivity Score

The second of the three factors in a source water assessment is hydrologic sensitivity. Hydrologic sensitivity considers how easily or quickly water moves through the subsurface of the earth. A well's hydrologic sensitivity score depends on the following:

1. Composition of surface soil. Soil drainage classes (defined in soil surveys published by the NRCS in 1998), ranging from poorly drained to moderately drained, such as silt and clay, are deemed more protective of ground water than moderately to well drained soils, such as sand and gravel, which drain faster.
2. Material in the vadose zone (the zone between the land surface and first encountered water). Vadose zone materials comprised of gravel or fractured rock provide less protection from

contamination than finer-grained sedimentary materials.

3. Depth at which ground water is first encountered. All other factors being equal, a greater depth to ground water provides greater opportunity for the attenuation of potential contaminants through adsorption and other mechanisms.
4. Presence of a low permeable unit (a layer of rock or sediment that does not transmit water easily, thus protecting the aquifer from contamination). For susceptibility scoring, DEQ considers a low permeable unit to be present if there is >50 feet of cumulative thickness of silt or clay-rich geologic materials, or fine grain sedimentary interbeds within basalt settings above the bottom of the annular seal to be protective of the aquifer.

Refer to the susceptibility score details page for more information on the hydrologic conditions for this source.

Poten al Contaminant Inventory/Land Use Scores

The last of the three factors scored in a source water assessment is the potential contaminant inventory (PCI)/land use. A potential contaminant is defined as any facility or activity that meets these criteria:

Stores, uses, or produces, as a product or by-product, the contaminants regulated under the federal Safe Drinking Water Act.

Has a potential for releasing the contaminants at levels that could potentially harm drinking water sources.

As part of each source water assessment, DEQ conducts an inventory of potential sources of contamination. The goal of the inventory is to locate and describe facilities, land uses, and environmental conditions that are potential sources of ground water contamination.

The inventory is a two-step process. First, DEQ identifies and documents potential contaminant sources in the source water assessment area using computer databases and GIS maps developed by DEQ and various state and federal agencies. Although DEQ uses the best information available, DEQ does not make any warranty regarding the accuracy or completeness of any information or data provided. For example, DEQ may not be able to obtain the exact location for each potential contaminant or may not be notified immediately of new sites or changes to existing sites. DEQ updates PCIs when new information warrants an update. The exact date inventories are updated is found in the PCI table. Second, the public water system receives a draft copy of the source water assessment and can provide comments to DEQ to correct or expand on the inventory. Although the public water system is only contacted by DEQ after the initial PCI is conducted, the public water system can review the PCI and submit corrections to DEQ at any time. Comments can be submitted to DEQ.

When agriculture is the predominant land use within the delineation, the likelihood of agricultural chemicals, such as fertilizers and pesticides, entering the ground water system may increase. This results in more points assessed for the IOC and SOC categories in the 0-3 year TOT zone. Additionally, depending on the percentage of agricultural land in each TOT, PCI/land use susceptibility scores may be influenced.

When the 0-3 year TOT zone intersects an area of defined ground water degradation, such as a nitrate priority area, additional points are assigned to the PCI/land use section of the susceptibility score. Nitrate is one of the most widespread ground water contaminants in Idaho. High levels of nitrate in drinking water are associated with adverse health effects. Therefore, DEQ designates areas with degraded ground water quality due to nitrate as nitrate priority areas with the goal of developing and implementing management strategies with local stakeholders to improve ground water quality.

Understanding Poten al Contaminant Source Informa on

The presence of a potential source of contamination means that the potential for contamination exists due to the nature of the business, industry, or operation. A release is less likely to occur from a potential source of contamination, when the facility or landowner uses best management practices to manage the potential contaminant. Many potential sources of contamination are regulated at the federal or state level, or both, to reduce the risk of release. Therefore, when businesses, facilities, or properties are identified as potential contaminant sources, it does not mean that they are violating any local, state, or federal environmental law or regulation.

The table below lists the potential contaminants for WELL #1 public water system. The public water system is not located within a nitrate priority area.

PWS Name: ALBION CITY OF (PWS# ID5160001)
Source Number: E0007566
Source Name: WELL #1
Potential Contaminants:

Export to Excel

TOT *	Description of Potential Contaminant Source [1, 4]	Potential Contaminant(s)	Name	Data Source [2]	Updated Date [3]
0-3 year	**Major And Minor Roads**				
0-3 year	**Surface Water**				
0-3 year	Deep Injection Well	IOC, VOC, SOC, Microbe		GIS	12/18/2019
0-3 year	**Underground Storage Tank (UST)**				
0-3 year	Leaking Underground Storage Tank	VOC, SOC	ALBION COUNTRY STORE	GIS	12/18/2019
0-3 year	Landfill	IOC, VOC, SOC, Microbe	Albion LF	GIS	12/18/2019
3-6 year	**Major And Minor Roads**				
3-6 year	**Surface Water**				
3-6 year	Underground Storage Tank (UST)	VOC, SOC	CREEKSIDE 66	GIS	12/18/2019
3-6 year	Brownfield Site	site specific	ALBION NORMAL SCHOOL	GIS	12/18/2019
3-6 year	General Waste Site	site specific	ALBION NORMAL SCHOOL	GIS	12/18/2019
3-6 year	Landfill	IOC, VOC, SOC, Microbe	Albion LF	GIS	12/18/2019
6-10 year	**Major And Minor Roads**				
6-10 year	**Surface Water**				

Footnotes:

1. The GIS datasets used to identify potential contaminants are gathered from various state and federal agencies and are updated on different intervals.
2. During the first phase of the PCI, known as the primary contaminant inventory, DEQ staff use GIS datasets and aerial photos to identify and document potential contaminant sources within the water system's source water assessment delineation. During the second phase of the PCI, known as the enhanced inventory, potential contaminants not already identified through GIS (e.g., septic systems, business sites, and land use activities) can be added to the PCI.

3. Date Updated refers to the most recent date each potential contaminant was last verified within the GIS datasets. PCIs are updated when new information warrants an update. Potential contaminants identified through aerial photos or enhanced inventories are updated less often.
4. Restriction of Liability for GIS Data: Neither the State of Idaho nor DEQ, nor any of their employees make any warranty, express or implied, or assume any legal liability or responsibility for the accuracy, completeness or usefulness of any information or data provided. Metadata are provided for all datasets, and no data should be used without first reading and understanding its limitations. The data could include technical inaccuracies or typographical errors. DEQ may update, modify, or revise the data used at any time, without notice.

* TOT = time of travel zone

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Refer to the susceptibility score details page for more information about the potential contaminants and land use within this delineation.

Conclusion

Local communities can use the information gathered through the assessment process to create a broader source water protection program to address current problems and prevent future threats to the quality of their drinking water supplies. Preventing contaminants from entering the public water system source can minimize health risks, expanded drinking water monitoring requirements, additional water treatment requirements, or expensive environmental cleanup activities. For assistance developing protection strategies, contact DEQ's Twin Falls Regional Office or the Idaho Rural Water Association. Also consider the following resources:

Idaho Source Water Protection Website

Idaho Source Water Protection Activities Guide

Idaho Source Water Protection Planning Tool

www.protectthesource.org

List of Acronyms and Abbrevia ons/Glossary

List of Acronyms and Abbreviated/Glossary

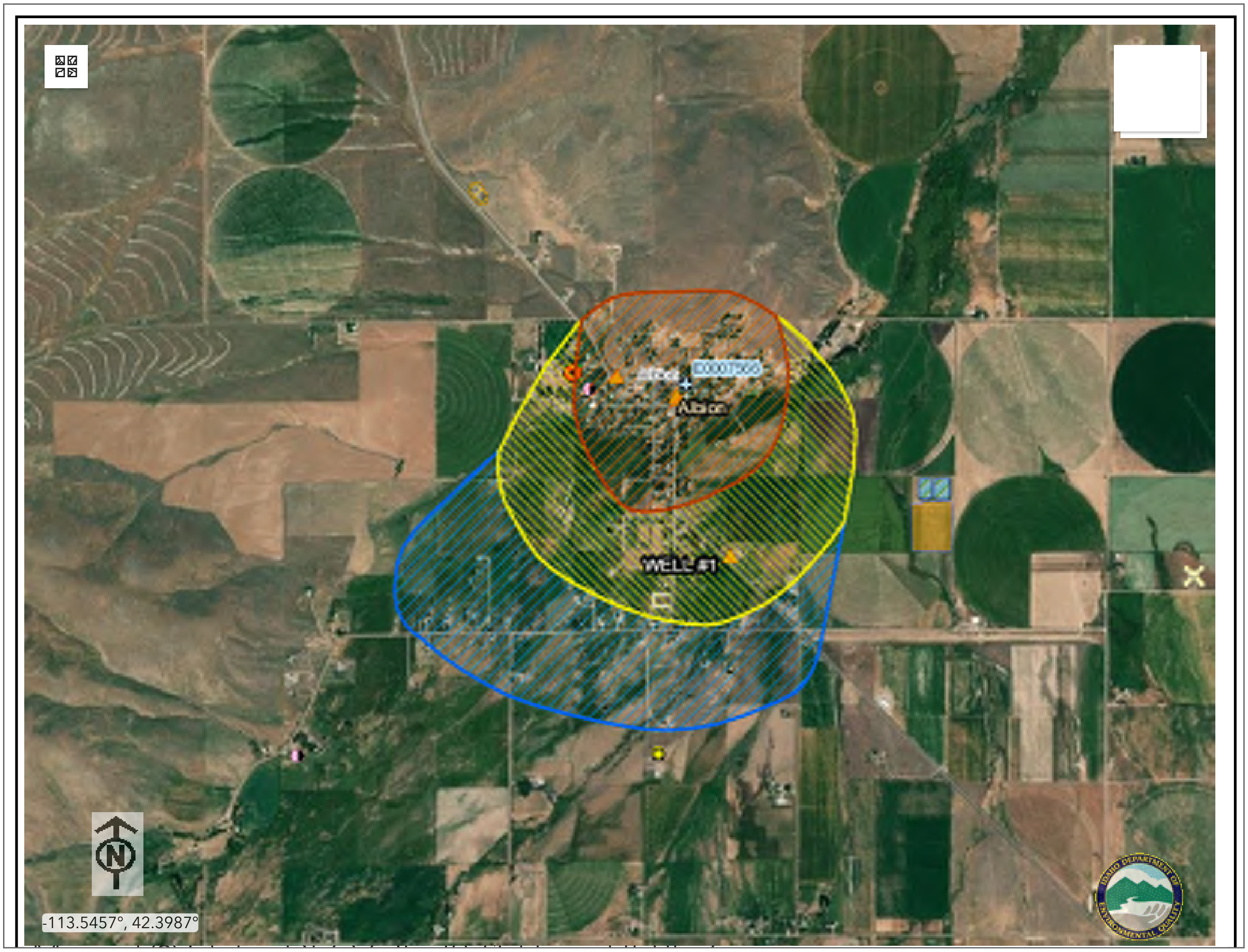
References

ID5160001 Well 1-3 2003 SWA Report.pdf

Map

The public water system is not located within a nitrate priority area.

Click here for dynamic map.
To save the map or legend right click on the images below and select save as.
(This map may take several seconds to load. We appreciate your patience.)



Map Legend

County Boundaries

Source Location

Source Water Delineations Time of Travel (TOT)

- 3 Year TOT
- 6 Year TOT
- 10 Year TOT
- Surface Water Buffer
- Fixed Radius
- Watershed Boundary

Potential Contaminants Inventory Locations

- Brownfield Site
- CERCLA Site
- Toxics Release Inventory Site
- General Waste Site
- UST/LUST Site
- Dairy
- Feedlot
- Managed Aquifer Recharge Site
- Deep Injection Well
- Shallow Injection Well
- NPDES Location
- RCRA Site
- Drain Location
- Road Salt Location
- Mine Site
- Tier II (formerly CAMEO)
- Sewage Drainfields
- Tunnels and Drains
- Railroad
- Phosphate Mine
- Water Reuse Area
- Wastewater Lagoon
- Pesticide Management Area
- Landfill

Streets (100k)

- Highway
- Limited Access
- Local Road
- Major Road
- Other Roads
- Ramp
- Trail
- 4WD

Hydrography

- Lakes
- Streams

IDEQ GIS May 2019

DEQ Intranet DEQ Website

Source Water Assessment Summary Report: ALBION CITY OF (PWS# ID5160001) WELL #2 E0007567

Introduc on

Source water is untreated ground water (aquifers and springs) and surface waters (rivers, streams, and lakes) used to supply drinking water for public water systems. In Idaho there are approximately 1,960 public water systems providing water to almost 1.5 million people. The US Environmental Protection Agency (EPA) requires the Idaho Department of Environmental Quality (DEQ) to assess every public water system source (well, spring, or surface water intake) in Idaho for its relative susceptibility to contaminants that are regulated by the federal Safe Drinking Water Act. There are approximately 3,500 active sources in Idaho. DEQ conducts source water assessments based on an inventory of potential contaminants and land uses within the delineated source water assessment area, construction of the well, sensitivity factors associated with the drinking water source, and local aquifer characteristics. The ultimate goal of each source water assessment is to provide data that communities can use to develop protection strategies for their drinking water sources (source water protection).

The resources and time available to accomplish source water assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water system is not possible. Instead, DEQ uses computer databases and geographic information system (GIS) maps to produce a potential contaminant inventory that can then be verified by the system or other stakeholders with an on-the-ground investigation. If any additional potential contaminants are identified, the system can create a potential contaminant enhanced inventory.

The results of source water assessments should not be used as an absolute measure of risk, nor should they be used to undermine public confidence in the public water system. A particular susceptibility score does not imply any regulatory or safety violations exist or contamination will occur. This report summarizes information about public water systems in Idaho. Using or distributing the data in this report in any other form may inaccurately portray the data.

DEQ strongly encourages each public water system and community to use its source water assessments, combined with local knowledge and concerns, to develop source water protection strategies. Multiple resources are available to help communities implement source water protection programs, including DEQ’s Source Water Protection Activity Guide and Source Water Protection Plan Template.

The protection of source water involves many partners. Various governmental entities and organizations play a role in protecting drinking water sources in Idaho and can be a resource for protection efforts. Source water protection activities should be coordinated with these entities to leverage resources and maximize results. For example, activities related to agricultural practices should be coordinated with the Idaho State Department of Agriculture, Idaho Soil and Water Conservation Commission, local Soil and Water Conservation District, and Natural Resources Conservation Service. Visit the Idaho Source Water Collaborative website for more information on potential partners and resources.

For assistance in developing protection strategies, contact DEQ's Twin Falls Regional Office or the Idaho Rural Water Association.

This report was completed March 26, 2003. Potential contaminant information was updated on January 10, 2020. Confirmed detections noted in the susceptibility report were updated January 2019 for community and NTNC sources active at the time of the update. (This could result in a change to a source's final susceptibility ranking.)

What Was Assessed

This report evaluates ALBION CITY OF (PWS# ID5160001) WELL #2 E0007567 located in CASSIA county. The system serves approximately 310 people through 151 connections.

Defining the Source Water Assessment Area

The first step of a source water assessment is to delineate the source water assessment area. The delineation process includes mapping the boundaries of the land area above the aquifer that could contribute water and potential pollutants to the water supply. The delineation illustrates the portion of the aquifer that supplies water to the well. Depending on the type of public water system (i.e., community, nontransient noncommunity, or transient noncommunity) and the amount of site-specific data available, one of three methods may be used to delineate a ground water source: (1) a fixed 1,000 foot radius, (2) a calculated fixed radius, or (3) a refined analytical method.

For community systems that serve at least 15 service connections or 25 people year-round in their primary residences (e.g., most cities and towns, apartments, and mobile home parks with their own water supplies) or nontransient noncommunity systems that serve at least 25 of the same persons over 6 months per year (e.g., schools, churches, nursing homes, and factories, and hospitals with their own water source), DEQ uses a refined analytical method approved by EPA to delineate up to three separate time-of-travel (TOT) zones.

The TOT zones illustrate the number of years necessary for a particle of water or contaminant to move from a specific point in the aquifer to the well. The refined analytical method uses site-specific data assimilated from a variety of sources, including well logs and hydrogeologic reports to determine the TOT zones. DEQ may use a calculated fixed radius method for community and nontransient noncommunity systems when site-specific data are not available. Generalized, existing, hydrogeologic data from the major aquifer types in Idaho, and data from the well pump rate are used in the average velocity equation to derive radii for 3-, 6-, and 10-year TOT zones.

The following three TOT zones are mapped:

- Zone I refers to the 0-3 TOT zone and is addressed by two subzones: Zone 1A and Zone 1B.
    - Zone IA refers to the sanitary setback, or the 50-foot radius around the well. The goal of this zone is to prevent contamination from nearby sources, particularly microbial contamination from sewer lines, livestock, surface waters, and septic systems.
    - Zone IB refers to the 0–3 year TOT zone. Water in this zone takes 0–3 years to travel in the aquifer to reach the well.
- Zone II refers to the 3–6 year TOT zone. Water in this zone takes 3–6 years to travel in the aquifer to reach the well.
- Zone III refers to the 6–10 year TOT zone. Water in this zone takes 6–10 years to travel in the aquifer to reach the well.

The source water assessment for WELL #2 was done using the Refined Analytical Method and is illustrated in the map provided. The data used to determine the source water assessment delineation for WELL #2 are included in the References section or available from DEQ upon request.

Suscep bility Analysis

The susceptibility analysis provides an estimate of the likelihood that the water supply will become contaminated. For each well, spring, or surface water intake in a public water system, susceptibility to contamination is scored as high, moderate, or low. Susceptibility scores for wells take into account three factors, which are described in more detail in later sections:

1. System Construction: Construction of the well being assessed.
2. Hydrologic Sensitivity: Hydrologic and geologic conditions surrounding the well.
3. Potential Contaminant Inventory(PCI)/Land Use: Potentially significant sources of contamination and land uses within the delineated source water assessment area.

Each of the factors listed above receives a score of high, medium, or low to reflect how susceptible the source is to potential contamination. Note that deriving susceptibility scores is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgment. Once completed, susceptibility scores are only updated upon request by the public water system.

PCI/land use scores and final susceptibility scores consist of four individual scores, one for each of four categories of contaminants:

Inorganic chemicals (IOC)

Volatile organic chemicals (VOC)

Synthetic organic chemicals (SOC)

Microbial contaminants

High susceptibility to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The susceptibility scores for WELL #2 are shown in the table below. Click here for full susceptibility score details.

Susceptibility Scores for ALBION CITY OF (PWS# ID5160001) WELL #2 E0007567									
System Construction	Potential Contaminant Inventory / Land Use				Hydrologic Sensitivity	Final Susceptibility Ranking			
	IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
M	H	H	H	H	M	High	High	High	Auto High
H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility. System Construction refers to the well, spring, or surface water intake.									
Auto High - see below.*			Report Date: 3/26/2003			Click for Map		Click for details	

***Auto-High Score:** Four situations cause automatic assignment of a high susceptibility score: (1) any detection of a VOC or SOC, (2) detection of an IOC at a concentration greater than the drinking water maximum contaminant level (MCL) set by EPA, (3) a confirmed microbial detection at the drinking water source, or (4) the presence of potential contaminant sources within 50 feet of a well. Additionally, ground water sources designated as under the direct influence of surface water (GWUDI) automatically rank high for microbial contaminants due to the inherent nature of surface water bodies as wildlife habitat and residence for various microorganisms. Any of the first three situations will trigger an auto-high score because a pathway for contamination already exists. Note that MCLs, detections, and potential contaminants can change over time and are not automatically updated in the score. Refer to the susceptibility score details page for more information on the contaminant source or detections resulting in an auto-high score.

System Construc on Score

The first of the three factors scored in a source water assessment is the system construction. System construction refers to the construction of the well that serves as the drinking water source. The construction of a well directly affects its ability to protect the aquifer from contaminants. System construction scores are lower when information shows that the design and integrity of the well can help prevent potential contaminants from reaching the aquifer. The system construction score depends on these five components:

1. Compliance with all current construction standards for public water system wells.
2. Condition of the wellhead and surface seal.
3. Placement of the well casing and annular seal into or through at least one continuous low permeability geologic unit of substantial thickness (≥10 feet) reduces the risk of contamination to the aquifer. (Permeability is the ability of a porous medium, such as rock, sediment, and soil, to transmit fluids under a hydraulic gradient; it is a measure of the relative ease of fluid flow under unequal pressure.)
4. Production of water from more than 100-feet below static water level. (Static water level refers to the level of water in a well under normal, no-pumping conditions.) Water drawn from deeper portions of an aquifer is typically buffered from most potential contaminants introduced at the land surface.
5. Location of the well outside of a 100-year floodplain. (A floodplain is flat or nearly flat land along a river or stream or in a tidal area that is covered by water during a flood. The 100-year floodplain is the area likely to be inundated during a flood with a 1% chance of being equaled or exceeded in any given year. DEQ uses data from the Federal Emergency Management Agency to determine the 100-year floodplain for any given area.) Locating wells outside a floodplain can help prevent direct contact between the wellhead and storm, flood, or irrigation water.

Idaho Department of Water Resources' rules regulate well construction ("Well Construction Standards Rules" [IDAPA 37.03.09]). These rules require all public water systems to also follow DEQ's well construction standards ("Idaho Rules for Public Drinking Water Systems" [IDAPA 58.01.08.510]). DEQ standards include screening requirements, depth of annular seal, use of a down-turned casing vent, and casing thickness, height, and depth. Current construction standards for public water system wells can be more stringent than standards in effect when a well was constructed, so your system construction score may be higher due to not meeting current well construction standards.

Your system construction score may also be higher if adequate information about the well is not available. Refer to the susceptibility score details page for more information about the construction of the well assessed in this report.

Hydrologic Sensi vity Score

The second of the three factors in a source water assessment is hydrologic sensitivity. Hydrologic sensitivity considers how easily or quickly water moves through the subsurface of the earth. A well's hydrologic sensitivity score depends on the following:

1. Composition of surface soil. Soil drainage classes (defined in soil surveys published by the NRCS in 1998), ranging from poorly drained to moderately drained, such as silt and clay, are deemed more protective of ground water than moderately to well drained soils, such as sand and gravel, which drain faster.
2. Material in the vadose zone (the zone between the land surface and first encountered water). Vadose zone materials comprised of gravel or fractured rock provide less protection from

contamination than finer-grained sedimentary materials.

3. Depth at which ground water is first encountered. All other factors being equal, a greater depth to ground water provides greater opportunity for the attenuation of potential contaminants through adsorption and other mechanisms.
4. Presence of a low permeable unit (a layer of rock or sediment that does not transmit water easily, thus protecting the aquifer from contamination). For susceptibility scoring, DEQ considers a low permeable unit to be present if there is >50 feet of cumulative thickness of silt or clay-rich geologic materials, or fine grain sedimentary interbeds within basalt settings above the bottom of the annular seal to be protective of the aquifer.

Refer to the susceptibility score details page for more information on the hydrologic conditions for this source.

Poten al Contaminant Inventory/Land Use Scores

The last of the three factors scored in a source water assessment is the potential contaminant inventory (PCI)/land use. A potential contaminant is defined as any facility or activity that meets these criteria:

Stores, uses, or produces, as a product or by-product, the contaminants regulated under the federal Safe Drinking Water Act.

Has a potential for releasing the contaminants at levels that could potentially harm drinking water sources.

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When the 0-3 year TOT zone intersects an area of defined ground water degradation, such as a nitrate priority area, additional points are assigned to the PCI/land use section of the susceptibility score. Nitrate is one of the most widespread ground water contaminants in Idaho. High levels of nitrate in drinking water are associated with adverse health effects. Therefore, DEQ designates areas with degraded ground water quality due to nitrate as nitrate priority areas with the goal of developing and implementing management strategies with local stakeholders to improve ground water quality.

Understanding Poten al Contaminant Source Informa on

The presence of a potential source of contamination means that the potential for contamination exists due to the nature of the business, industry, or operation. A release is less likely to occur from a potential source of contamination, when the facility or landowner uses best management practices to manage the potential contaminant. Many potential sources of contamination are regulated at the federal or state level, or both, to reduce the risk of release. Therefore, when businesses, facilities, or properties are identified as potential contaminant sources, it does not mean that they are violating any local, state, or federal environmental law or regulation.

The table below lists the potential contaminants for WELL #2 public water system. The public water system is not located within a nitrate priority area.

PWS Name: ALBION CITY OF (PWS# ID5160001)
Source Number: E0007567
Source Name: WELL #2
Potential Contaminants:

Export to Excel

TOT *	Description of Potential Contaminant Source [1, 4]	Potential Contaminant(s)	Name	Data Source [2]	Updated Date [3]
0-3 year	**Major And Minor Roads**				
0-3 year	**Surface Water**				
0-3 year	Deep Injection Well	IOC, VOC, SOC, Microbe		GIS	1/10/2020
0-3 year	**Underground Storage Tank (UST)**				
0-3 year	Leaking Underground Storage Tank	VOC, SOC	ALBION COUNTRY STORE	GIS	1/10/2020
0-3 year	Brownfield Site	site specific	ALBION NORMAL SCHOOL	GIS	1/10/2020
0-3 year	General Waste Site	site specific	ALBION NORMAL SCHOOL	GIS	1/10/2020
0-3 year	Landfill	IOC, VOC, SOC, Microbe	Albion LF	GIS	1/10/2020
3-6 year	**Major And Minor Roads**				
3-6 year	**Surface Water**				
3-6 year	Underground Storage Tank (UST)	VOC, SOC	CREEKSIDE 66	GIS	1/10/2020
3-6 year	RCRA Site	Site specific	WR HIGH DESERT FUEL SERVICES LLC	GIS	1/10/2020
3-6 year	**Landfill**				
6-10 year	**Major And Minor Roads**				
6-10 year	**Surface Water**				
6-10 year	Landfill	IOC, VOC, SOC, Microbe	Albion TS	GIS	1/10/2020

Footnotes:

1. The GIS datasets used to identify potential contaminants are gathered from various state and federal agencies and are updated on different intervals.

2. During the first phase of the PCI, known as the primary contaminant inventory, DEQ staff use GIS datasets and aerial photos to identify and document potential contaminant sources within the water system's source water assessment delineation. During the second phase of the PCI, known as the enhanced inventory, potential contaminants not already identified through GIS (e.g., septic systems, business sites, and land use activities) can be added to the PCI.
3. Date Updated refers to the most recent date each potential contaminant was last verified within the GIS datasets. PCIs are updated when new information warrants an update. Potential contaminants identified through aerial photos or enhanced inventories are updated less often.
4. Restriction of Liability for GIS Data: Neither the State of Idaho nor DEQ, nor any of their employees make any warranty, express or implied, or assume any legal liability or responsibility for the accuracy, completeness or usefulness of any information or data provided. Metadata are provided for all datasets, and no data should be used without first reading and understanding its limitations. The data could include technical inaccuracies or typographical errors. DEQ may update, modify, or revise the data used at any time, without notice.

* TOT = time of travel zone

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Refer to the susceptibility score details page for more information about the potential contaminants and land use within this delineation.

Conclusion

Local communities can use the information gathered through the assessment process to create a broader source water protection program to address current problems and prevent future threats to the quality of their drinking water supplies. Preventing contaminants from entering the public water system source can minimize health risks, expanded drinking water monitoring requirements, additional water treatment requirements, or expensive environmental cleanup activities. For assistance developing protection strategies, contact DEQ's Twin Falls Regional Office or the Idaho Rural Water Association. Also consider the following resources:

Idaho Source Water Protection Website

Idaho Source Water Protection Activities Guide

Idaho Source Water Protection Planning Tool

www.protectthesource.org

List of Acronyms and Abbrevia ons/Glossary

List of Acronyms and Abbreviated/Glossary

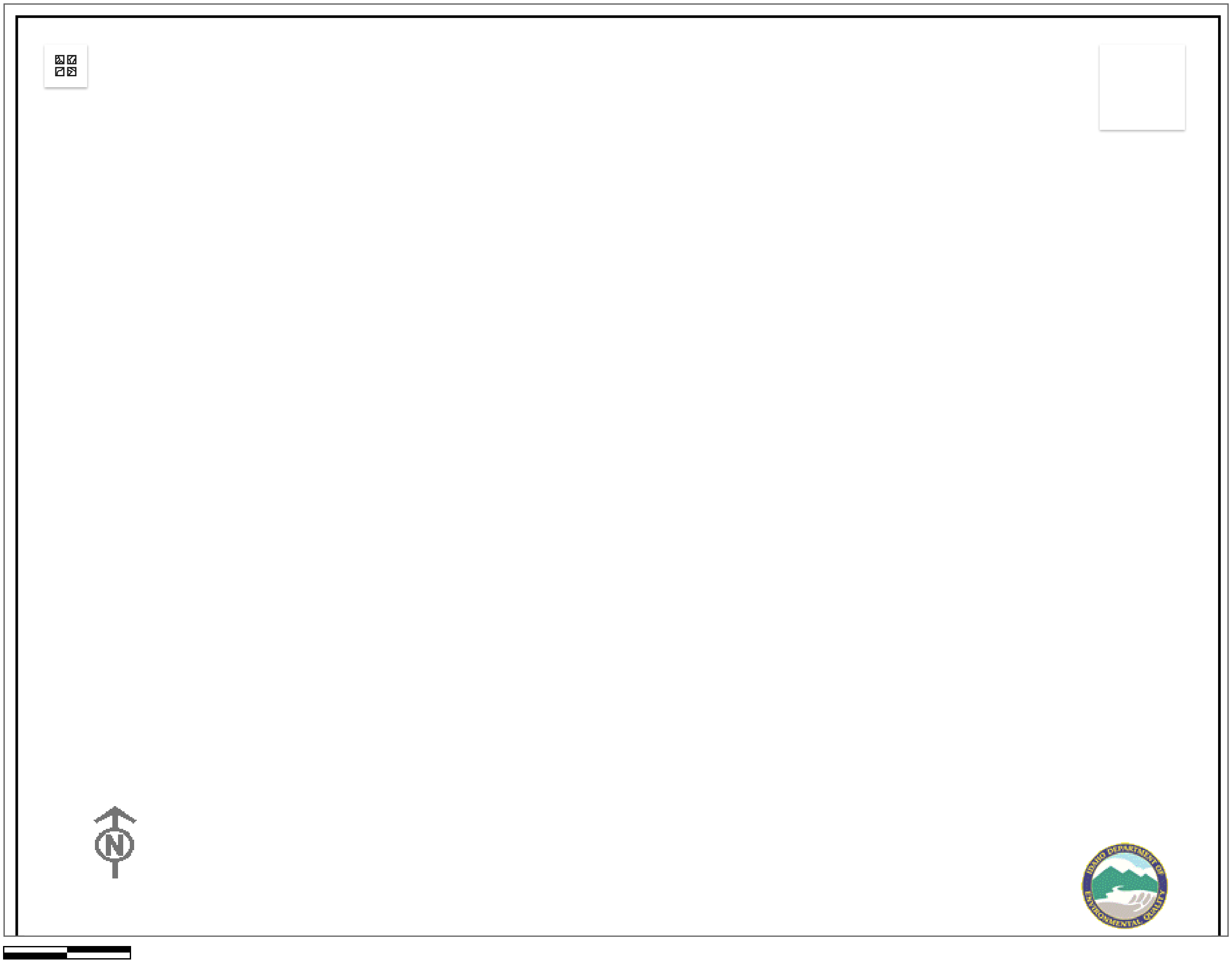
References

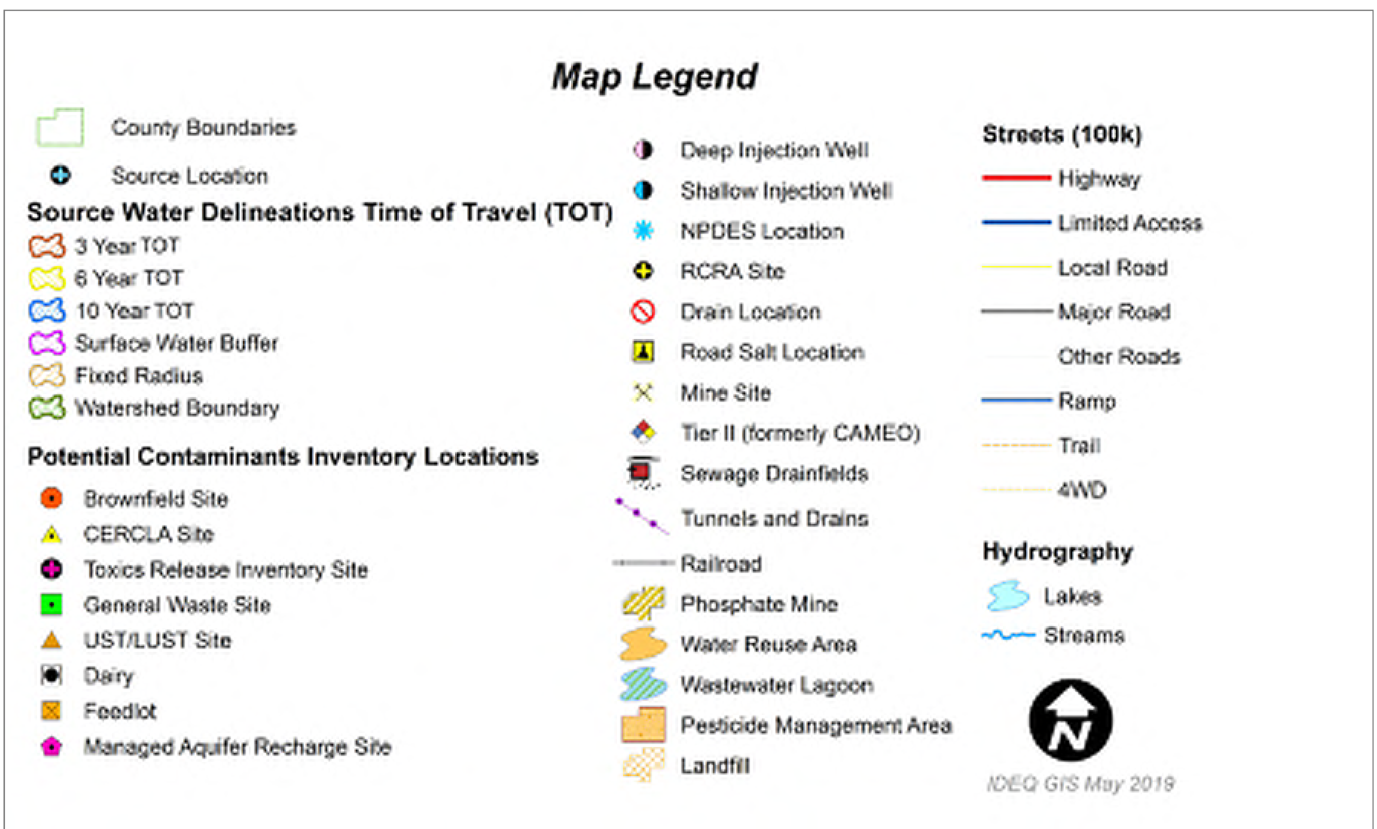
ID5160001 Well 1-3 2003 SWA Report.pdf

Map

The public water system is not located within a nitrate priority area.

Click here for dynamic map.
To save the map or legend right click on the images below and select save as.
(This map may take several seconds to load. We appreciate your patience.)





Map Legend
County Boundaries
Source Location
Source Water Delineations Time of Travel (TOT)
3 Year TOT
6 Year TOT
10 Year TOT
Surface Water Buffer
Fixed Radius
Watershed Boundary
Potential Contaminants Inventory Locations
Brownfield Site
CERCLA Site
Toxics Release Inventory Site
General Waste Site
UST/LUST Site
Dairy
Feedlot
Managed Aquifer Recharge Site
Deep Injection Well
Shallow Injection Well
NPDES Location
RCRA Site
Drain Location
Road Salt Location
Mine Site
Tier II (formerly CAMEO)
Sewage Drainfields
Tunnels and Drains
Railroad
Phosphate Mine
Water Reuse Area
Wastewater Lagoon
Pesticide Management Area
Landfill
Streets (100k)
Highway
Limited Access
Local Road
Major Road
Other Roads
Ramp
Trail
4WD
Hydrography
Lakes
Streams
N
IDEQ GIS May 2019

DEQ Intranet DEQ Website

Source Water Assessment Summary Report: ALBION CITY OF (PWS# ID5160001) WELL #3 E0007568

Introduc on

Source water is untreated ground water (aquifers and springs) and surface waters (rivers, streams, and lakes) used to supply drinking water for public water systems. In Idaho there are approximately 1,960 public water systems providing water to almost 1.5 million people. The US Environmental Protection Agency (EPA) requires the Idaho Department of Environmental Quality (DEQ) to assess every public water system source (well, spring, or surface water intake) in Idaho for its relative susceptibility to contaminants that are regulated by the federal Safe Drinking Water Act. There are approximately 3,500 active sources in Idaho. DEQ conducts source water assessments based on an inventory of potential contaminants and land uses within the delineated source water assessment area, construction of the well, sensitivity factors associated with the drinking water source, and local aquifer characteristics. The ultimate goal of each source water assessment is to provide data that communities can use to develop protection strategies for their drinking water sources (source water protection).

The resources and time available to accomplish source water assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water system is not possible. Instead, DEQ uses computer databases and geographic information system (GIS) maps to produce a potential contaminant inventory that can then be verified by the system or other stakeholders with an on-the-ground investigation. If any additional potential contaminants are identified, the system can create a potential contaminant enhanced inventory.

The results of source water assessments should not be used as an absolute measure of risk, nor should they be used to undermine public confidence in the public water system. A particular susceptibility score does not imply any regulatory or safety violations exist or contamination will occur. This report summarizes information about public water systems in Idaho. Using or distributing the data in this report in any other form may inaccurately portray the data.

DEQ strongly encourages each public water system and community to use its source water assessments, combined with local knowledge and concerns, to develop source water protection strategies. Multiple resources are available to help communities implement source water protection programs, including DEQ's Source Water Protection Activity Guide and Source Water Protection Plan Template.

The protection of source water involves many partners. Various governmental entities and organizations play a role in protecting drinking water sources in Idaho and can be a resource for protection efforts. Source water protection activities should be coordinated with these entities to leverage resources and maximize results. For example, activities related to agricultural practices should be coordinated with the Idaho State Department of Agriculture, Idaho Soil and Water Conservation Commission, local Soil and Water Conservation District, and Natural Resources Conservation Service. Visit the Idaho Source Water Collaborative website for more information on potential partners and resources.

For assistance in developing protection strategies, contact DEQ's Twin Falls Regional Office or the Idaho Rural Water Association.

This report was completed March 26, 2003. Potential contaminant information was updated on December 18, 2019. Confirmed detections noted in the susceptibility report were updated January 2019 for community and NTNC sources active at the time of the update. (This could result in a change to a source's final susceptibility ranking.)

What Was Assessed

This report evaluates ALBION CITY OF (PWS# ID5160001) WELL #3 E0007568 located in CASSIA county. The system serves approximately 310 people through 151 connections.

Defining the Source Water Assessment Area

The first step of a source water assessment is to delineate the source water assessment area. The delineation process includes mapping the boundaries of the land area above the aquifer that could contribute water and potential pollutants to the water supply. The delineation illustrates the portion of the aquifer that supplies water to the well. Depending on the type of public water system (i.e., community, nontransient noncommunity, or transient noncommunity) and the amount of site-specific data available, one of three methods may be used to delineate a ground water source: (1) a fixed 1,000 foot radius, (2) a calculated fixed radius, or (3) a refined analytical method.

For community systems that serve at least 15 service connections or 25 people year-round in their primary residences (e.g., most cities and towns, apartments, and mobile home parks with their own water supplies) or nontransient noncommunity systems that serve at least 25 of the same persons over 6 months per year (e.g., schools, churches, nursing homes, and factories, and hospitals with their own water source), DEQ uses a refined analytical method approved by EPA to delineate up to three separate time-of-travel (TOT) zones.

The TOT zones illustrate the number of years necessary for a particle of water or contaminant to move from a specific point in the aquifer to the well. The refined analytical method uses site-specific data assimilated from a variety of sources, including well logs and hydrogeologic reports to determine the TOT zones. DEQ may use a calculated fixed radius method for community and nontransient noncommunity systems when site-specific data are not available. Generalized, existing, hydrogeologic data from the major aquifer types in Idaho, and data from the well pump rate are used in the average velocity equation to derive radii for 3-, 6-, and 10-year TOT zones.

The following three TOT zones are mapped:

- Zone I refers to the 0-3 TOT zone and is addressed by two subzones: Zone 1A and Zone 1B.
  - Zone IA refers to the sanitary setback, or the 50-foot radius around the well. The goal of this zone is to prevent contamination from nearby sources, particularly microbial contamination from sewer lines, livestock, surface waters, and septic systems.
  - Zone IB refers to the 0–3 year TOT zone. Water in this zone takes 0–3 years to travel in the aquifer to reach the well.
- Zone II refers to the 3–6 year TOT zone. Water in this zone takes 3–6 years to travel in the aquifer to reach the well.
- Zone III refers to the 6–10 year TOT zone. Water in this zone takes 6–10 years to travel in the aquifer to reach the well.

The source water assessment for WELL #3 was done using the Refined Analytical Method and is illustrated in the map provided. The data used to determine the source water assessment delineation for WELL #3 are included in the References section or available from DEQ upon request.

Suscep bility Analysis

The susceptibility analysis provides an estimate of the likelihood that the water supply will become contaminated. For each well, spring, or surface water intake in a public water system, susceptibility to contamination is scored as high, moderate, or low. Susceptibility scores for wells take into account three factors, which are described in more detail in later sections:

1. System Construction: Construction of the well being assessed.
2. Hydrologic Sensitivity: Hydrologic and geologic conditions surrounding the well.
3. Potential Contaminant Inventory(PCI)/Land Use: Potentially significant sources of contamination and land uses within the delineated source water assessment area.

Each of the factors listed above receives a score of high, medium, or low to reflect how susceptible the source is to potential contamination. Note that deriving susceptibility scores is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgment. Once completed, susceptibility scores are only updated upon request by the public water system.

PCI/land use scores and final susceptibility scores consist of four individual scores, one for each of four categories of contaminants:

Inorganic chemicals (IOC)

Volatile organic chemicals (VOC)

Synthetic organic chemicals (SOC)

Microbial contaminants

High susceptibility to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The susceptibility scores for WELL #3 are shown in the table below. Click here for full susceptibility score details.

Susceptibility Scores for ALBION CITY OF (PWS# ID5160001) WELL #3 E0007568									
System Construction	Potential Contaminant Inventory / Land Use				Hydrologic Sensitivity	Final Susceptibility Ranking			
	IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
M	H	H	H	H	H	H	H	H	H
H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility. System Construction refers to the well, spring, or surface water intake.									
Auto High - see below.*			Report Date: 3/26/2003			Click for Map		Click for details	

***Auto-High Score:** Four situations cause automatic assignment of a high susceptibility score: (1) any detection of a VOC or SOC, (2) detection of an IOC at a concentration greater than the drinking water maximum contaminant level (MCL) set by EPA, (3) a confirmed microbial detection at the drinking water source, or (4) the presence of potential contaminant sources within 50 feet of a well. Additionally, ground water sources designated as under the direct influence of surface water (GWUDI) automatically rank high for microbial contaminants due to the inherent nature of surface water bodies as wildlife habitat and residence for various microorganisms. Any of the first three situations will trigger an auto-high score because a pathway for contamination already exists. Note that MCLs, detections, and potential contaminants can change over time and are not automatically updated in the score. Refer to the susceptibility score details page for more information on the contaminant source or detections resulting in an auto-high score.

System Construc on Score

The first of the three factors scored in a source water assessment is the system construction. System construction refers to the construction of the well that serves as the drinking water source. The construction of a well directly affects its ability to protect the aquifer from contaminants. System construction scores are lower when information shows that the design and integrity of the well can help prevent potential contaminants from reaching the aquifer. The system construction score depends on these five components:

1. Compliance with all current construction standards for public water system wells.
2. Condition of the wellhead and surface seal.
3. Placement of the well casing and annular seal into or through at least one continuous low permeability geologic unit of substantial thickness (≥10 feet) reduces the risk of contamination to the aquifer. (Permeability is the ability of a porous medium, such as rock, sediment, and soil, to transmit fluids under a hydraulic gradient; it is a measure of the relative ease of fluid flow under unequal pressure.)
4. Production of water from more than 100-feet below static water level. (Static water level refers to the level of water in a well under normal, no-pumping conditions.) Water drawn from deeper portions of an aquifer is typically buffered from most potential contaminants introduced at the land surface.
5. Location of the well outside of a 100-year floodplain. (A floodplain is flat or nearly flat land along a river or stream or in a tidal area that is covered by water during a flood. The 100-year floodplain is the area likely to be inundated during a flood with a 1% chance of being equaled or exceeded in any given year. DEQ uses data from the Federal Emergency Management Agency to determine the 100-year floodplain for any given area.) Locating wells outside a floodplain can help prevent direct contact between the wellhead and storm, flood, or irrigation water.

Idaho Department of Water Resources' rules regulate well construction ("Well Construction Standards Rules" [IDAPA 37.03.09]). These rules require all public water systems to also follow DEQ's well construction standards ("Idaho Rules for Public Drinking Water Systems" [IDAPA 58.01.08.510]). DEQ standards include screening requirements, depth of annular seal, use of a down-turned casing vent, and casing thickness, height, and depth. Current construction standards for public water system wells can be more stringent than standards in effect when a well was constructed, so your system construction score may be higher due to not meeting current well construction standards.

Your system construction score may also be higher if adequate information about the well is not available. Refer to the susceptibility score details page for more information about the construction of the well assessed in this report.

Hydrologic Sensi vity Score

The second of the three factors in a source water assessment is hydrologic sensitivity. Hydrologic sensitivity considers how easily or quickly water moves through the subsurface of the earth. A well's hydrologic sensitivity score depends on the following:

1. Composition of surface soil. Soil drainage classes (defined in soil surveys published by the NRCS in 1998), ranging from poorly drained to moderately drained, such as silt and clay, are deemed more protective of ground water than moderately to well drained soils, such as sand and gravel, which drain faster.
2. Material in the vadose zone (the zone between the land surface and first encountered water). Vadose zone materials comprised of gravel or fractured rock provide less protection from

contamination than finer-grained sedimentary materials.

3. Depth at which ground water is first encountered. All other factors being equal, a greater depth to ground water provides greater opportunity for the attenuation of potential contaminants through adsorption and other mechanisms.
4. Presence of a low permeable unit (a layer of rock or sediment that does not transmit water easily, thus protecting the aquifer from contamination). For susceptibility scoring, DEQ considers a low permeable unit to be present if there is >50 feet of cumulative thickness of silt or clay-rich geologic materials, or fine grain sedimentary interbeds within basalt settings above the bottom of the annular seal to be protective of the aquifer.

Refer to the susceptibility score details page for more information on the hydrologic conditions for this source.

Poten al Contaminant Inventory/Land Use Scores

The last of the three factors scored in a source water assessment is the potential contaminant inventory (PCI)/land use. A potential contaminant is defined as any facility or activity that meets these criteria:

Stores, uses, or produces, as a product or by-product, the contaminants regulated under the federal Safe Drinking Water Act.

Has a potential for releasing the contaminants at levels that could potentially harm drinking water sources.

As part of each source water assessment, DEQ conducts an inventory of potential sources of contamination. The goal of the inventory is to locate and describe facilities, land uses, and environmental conditions that are potential sources of ground water contamination.

The inventory is a two-step process. First, DEQ identifies and documents potential contaminant sources in the source water assessment area using computer databases and GIS maps developed by DEQ and various state and federal agencies. Although DEQ uses the best information available, DEQ does not make any warranty regarding the accuracy or completeness of any information or data provided. For example, DEQ may not be able to obtain the exact location for each potential contaminant or may not be notified immediately of new sites or changes to existing sites. DEQ updates PCIs when new information warrants an update. The exact date inventories are updated is found in the PCI table. Second, the public water system receives a draft copy of the source water assessment and can provide comments to DEQ to correct or expand on the inventory. Although the public water system is only contacted by DEQ after the initial PCI is conducted, the public water system can review the PCI and submit corrections to DEQ at any time. Comments can be submitted to DEQ.

When agriculture is the predominant land use within the delineation, the likelihood of agricultural chemicals, such as fertilizers and pesticides, entering the ground water system may increase. This results in more points assessed for the IOC and SOC categories in the 0-3 year TOT zone. Additionally, depending on the percentage of agricultural land in each TOT, PCI/land use susceptibility scores may be influenced.

When the 0-3 year TOT zone intersects an area of defined ground water degradation, such as a nitrate priority area, additional points are assigned to the PCI/land use section of the susceptibility score. Nitrate is one of the most widespread ground water contaminants in Idaho. High levels of nitrate in drinking water are associated with adverse health effects. Therefore, DEQ designates areas with degraded ground water quality due to nitrate as nitrate priority areas with the goal of developing and implementing management strategies with local stakeholders to improve ground water quality.

Understanding Poten al Contaminant Source Informa on

The presence of a potential source of contamination means that the potential for contamination exists due to the nature of the business, industry, or operation. A release is less likely to occur from a potential source of contamination, when the facility or landowner uses best management practices to manage the potential contaminant. Many potential sources of contamination are regulated at the federal or state level, or both, to reduce the risk of release. Therefore, when businesses, facilities, or properties are identified as potential contaminant sources, it does not mean that they are violating any local, state, or federal environmental law or regulation.

The table below lists the potential contaminants for WELL #3 public water system. The public water system is not located within a nitrate priority area.

PWS Name: ALBION CITY OF (PWS# ID5160001)
Source Number: E0007568
Source Name: WELL #3
Potential Contaminants:

Export to Excel

TOT *	Description of Potential Contaminant Source [1, 4]	Potential Contaminant(s)	Name	Data Source [2]	Updated Date [3]
0-3 year	**Major And Minor Roads**				
0-3 year	Surface Water	Site specific		GIS	3/15/2013
0-3 year	Deep Injection Well	IOC, VOC, SOC, Microbe		GIS	12/18/2019
0-3 year	Brownfield Site	site specific	ALBION NORMAL SCHOOL	GIS	12/18/2019
0-3 year	General Waste Site	site specific	ALBION NORMAL SCHOOL	GIS	12/18/2019
3-6 year	**Major And Minor Roads**				
3-6 year	**Surface Water**				
3-6 year	Landfill	IOC, VOC, SOC, Microbe	Albion TS	GIS	12/18/2019
6-10 year	**Major And Minor Roads**				
6-10 year	**Surface Water**				
6-10 year	Landfill	IOC, VOC, SOC, Microbe	Albion TS	GIS	12/18/2019

Footnotes:

1. The GIS datasets used to identify potential contaminants are gathered from various state and federal agencies and are updated on different intervals.
2. During the first phase of the PCI, known as the primary contaminant inventory, DEQ staff use GIS datasets and aerial photos to identify and document potential contaminant sources within the water system's source water assessment delineation. During the second phase of the PCI, known as the enhanced inventory, potential contaminants not already identified through GIS (e.g., septic systems, business sites, and land use activities) can be added to the PCI.
3. Date Updated refers to the most recent date each potential contaminant was last verified within the GIS datasets. PCIs are updated when new information warrants an update. Potential contaminants identified through aerial photos or enhanced inventories are updated less often.

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* TOT = time of travel zone

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Refer to the susceptibility score details page for more information about the potential contaminants and land use within this delineation.

Conclusion

Local communities can use the information gathered through the assessment process to create a broader source water protection program to address current problems and prevent future threats to the quality of their drinking water supplies. Preventing contaminants from entering the public water system source can minimize health risks, expanded drinking water monitoring requirements, additional water treatment requirements, or expensive environmental cleanup activities. For assistance developing protection strategies, contact DEQ's Twin Falls Regional Office or the Idaho Rural Water Association. Also consider the following resources:

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List of Acronyms and Abbrevia ons/Glossary

List of Acronyms and Abbreviated/Glossary

References

ID5160001 Well 1-3 2003 SWA Report.pdf

Map

The public water system is not located within a nitrate priority area.

Click here for dynamic map.
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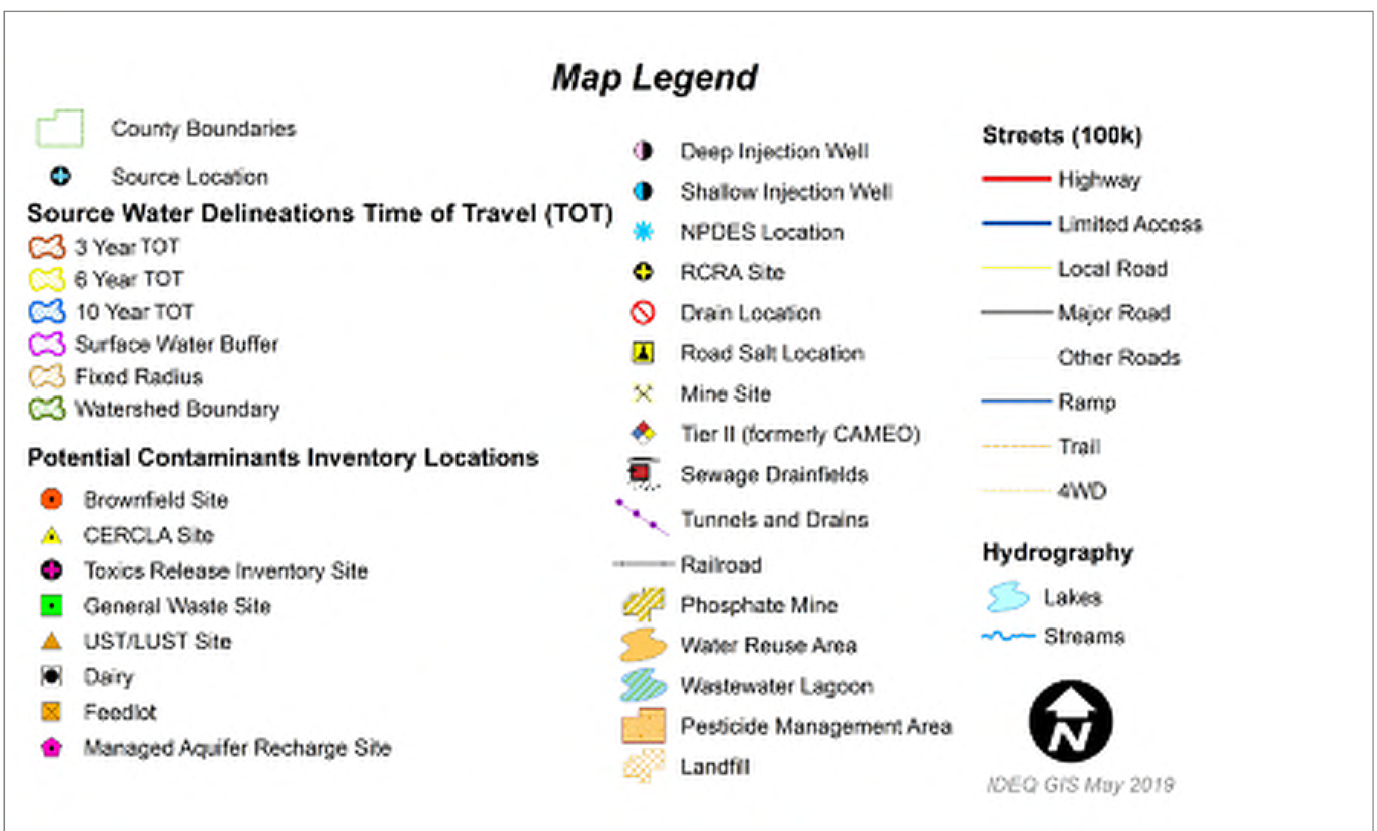
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4WD
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Streams
IDEQ GIS May 2019

DEQ Intranet DEQ Website

IDAHO Department of Environmental Quality

Source Water Protection Planning Tool

SOURCE WATER PROTECTION PLAN

For

CITY OF ALBION

ID5160001

Certified Date 12/11/2020

Table of Contents

1 Introduction

CITY OF ALBION developed this source water protection plan in recognition that clean and safe drinking water supplies are critical to public health, environmental quality, economic development, and the quality of life of its residents. Source water, from both ground water and surface water sources, can easily become contaminated, and once source water becomes contaminated, it can be difficult and expensive to clean up. Proactive planning, education, and prevention are essential to both the long-term integrity of the water system and in limiting future costs and liabilities to the community.

The Idaho Department of Environmental Quality (DEQ) completed source water assessments for all public water systems in Idaho, as required by the Safe Drinking Water Act, and continues to assess new sources as they become active. Source water assessment reports provide information to the water systems on the land area contributing water to each public drinking water systems source, the major potential sources of contamination that could affect the drinking water supply, and how susceptible the public water supply is to potential contamination.

CITY OF ALBION has used the information provided in the CITY OF ALBION source water assessment report to identify actions to reduce potential sources of contamination and better protect their drinking water supplies. By developing and implementing source water protection measures at the local level, CITY OF ALBION will help to ensure a clean and safe drinking water sources for current and future generations. Source water assessment reports are available on DEQ's website at www.deq.idaho.gov/water/swaOnline/.

2 Components of the Plan

CITY OF ALBION developed this source water protection plan according to DEQ's state source water protection certification requirements outlined in the Idaho Source Water Assessment Plan and the American Water Works Association's G300 Source Water Protection Standard (DEQ 1999, AWWA 2007). The plan includes the following components:

1. Overview of drinking water system
2. Establishment of a planning team
3. Vision statement and goals
4. Delineation of the source water area(s) to be protected
5. Susceptibility to potential and existing contaminants
6. Implementation activities to accomplish source water protection goals
7. Emergency response plan and recommendations for future drinking water sources

3 Drinking Water System Information

CITY OF ALBION (ID5160001) is a community public water system located in CASSIA County and provides drinking water to approximately 310 people through 151 service connections. The system has a storage volume of 276,000 Gallons and an average daily demand of 218,770 GPD and a maximum daily demand of 825,240 GPD.

CITY OF ALBION uses ground water (active sources) for its drinking water supply. Ground water used for drinking water supplies is often vulnerable to contamination from land use practices and potential contaminant sources within the vicinity of the drinking water source. CITY OF ALBION has developed this plan in an effort to minimize the risk of contamination to the drinking water source.

CITY OF ALBION has 3 drinking water source(s). Drinking water sources addressed by this plan are included in Table 1.

Table 1: CITY OF ALBION drinking water sources.

Source Name	Tag Number	Type of Source	Activity Status
WELL #1	E0007566	Well	Active

Source Name	Tag Number	Type of Source	Activity Status
WELL #2	E0007567	Well	Active
WELL #3	E0007568	Well	InActive

4 Planning Team

A planning team was established to develop this source water protection plan. The team coordinator for the CITY OF ALBION source water protection planning team is Bryan Day. The team coordinator is responsible for planning future team meetings, coordinating implementation items identified in the plan, and serving as the primary contact.

The members of the CITY OF ALBION source water protection planning team include the individuals listed in Table 2.

Table 2: CITY OF ALBION Source Water Protection Community Planning Team.

Name	Organization/Title	Phone Number	Email
Bryan Day	City of Albion	(208) 673-5352	cofapublicworks@gmail.com
Mary Yeaman	City of Albion		(mailto:)
Isaac Loveland	City of Albion		(mailto:)
Deric Bell	City of Albion		(mailto:)

Technical assistance was provided by:

- Irene Nautch, Idaho Department of Environmental Quality
- Lamont Young, City of Declo

5 Vision Statement and Goals

The planning team developed a formal vision to help guide the development of this plan. The vision expresses the value and commitment of the water system and the planning team to source water protection. The planning team's vision for this plan is: Provide safe and reliable high quality drinking water for present and future needs.

To meet this vision, the planning team set the following goals for this plan:

- Goal 1 - Protect and maintain the quality of Albion's drinking water now and in the future.
- Goal 2 - Increase awareness of the community's drinking water sources and their protection.
- Goal 3 - Ensuring adequate water capacity for anticipated demands.

6 Source Water Protection Area Delineation

DEQ delineated the source water assessment area for the CITY OF ALBION as part of the source water assessment process (Figure 1 and Appendix A). The source water delineation was developed by mapping the zone of contribution, which is that portion of the watershed or subsurface area contributing water to the drinking water source.

For ground water sources, the delineation is defined by the time it takes water to travel to that specific well or spring. Depending on the type of public water system (i.e., community, non-community/non-transient or transient) and the amount of site-specific data available, one of three methods may be used to delineate a ground water source (well or spring): (1) a fixed 1,000 foot radius, (2) a calculated fixed radius, or (3) a refined analytical model. Delineations created using a calculated fixed radius or refined analytical model are typically divided into up to three time-of-travel (TOT) zones (3-year, 6-year, and 10-year), which is the number of years necessary for a particle of water or contaminant to move from a specific point in the aquifer to the well or spring.

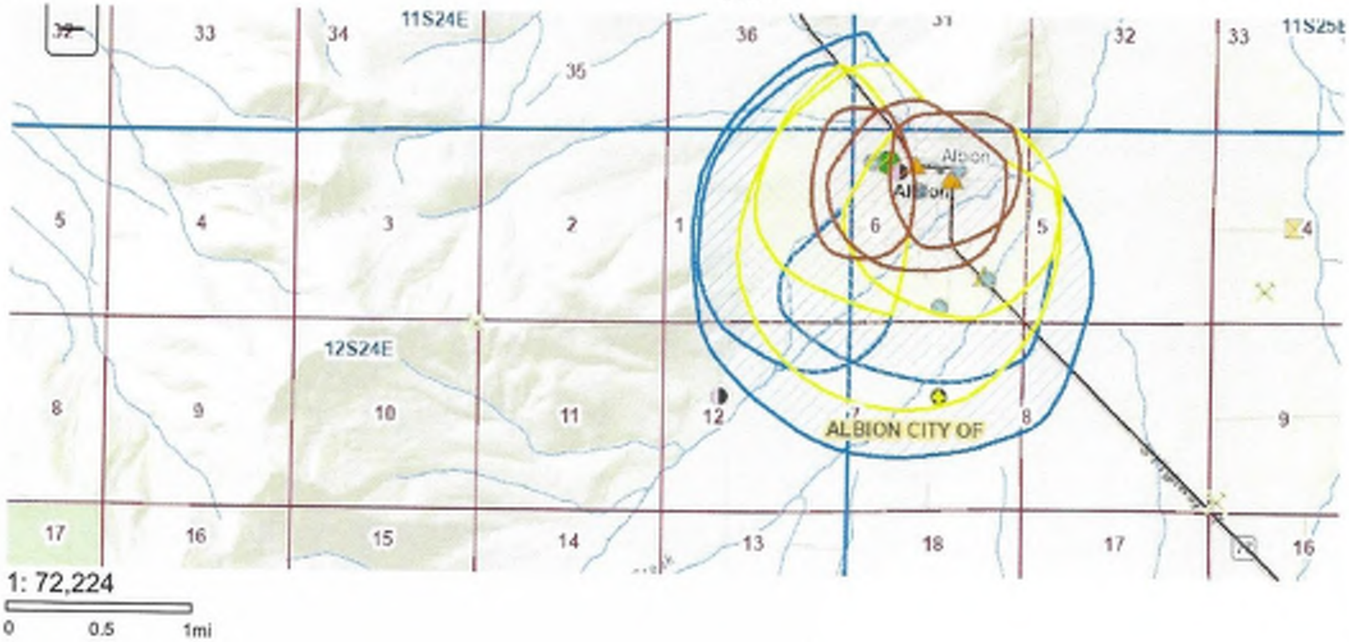
For WELL #1, WELL #2 , WELL #3 , DEQ used a refined analytical model approved by EPA to delineate up to three separate time-of-travel (TOT) zones.

The TOT zones illustrate the number of years necessary for a particle of water or contaminant to move from a specific point in the aquifer to the well. The refined analytical model uses site-specific data assimilated from a variety of sources, including well logs and hydrogeologic reports to determine the TOT zones. DEQ may use a calculated fixed radius method for community and nontransient noncommunity systems when site-specific data are not available. Generalized, existing, hydrogeologic data from the major aquifer types in Idaho, and data from the well pump rate are used in the average velocity equation to derive radii for 3-, 6-, and 10-year TOT zones.

- Zone I refers to the 0-3 TOT zone and is addressed by two subzones: Zone 1A and Zone 1B.
  - Zone IA refers to the sanitary setback, or the 50-foot radius around the well. The goal of this zone is to prevent contamination from nearby sources, particularly microbial contamination from sewer lines, livestock, surface waters, and septic systems.
  - Zone IB refers to the 0–3 year TOT zone. Water in this zone takes 0–3 years to travel in the aquifer to reach the well.
- Zone II refers to the 3–6 year TOT zone. Water in this zone takes 3–6 years to travel in the aquifer to reach the well.
- Zone III refers to the 6–10 year TOT zone. Water in this zone takes 6–10 years to travel in the aquifer to reach the well.

For more information about how ground water and surface water sources are delineated, view your system's source water assessment report or the Idaho Source Water Assessment Plan. Site-specific data used to determine the source water assessment areas are available from DEQ upon request.

Figure 1. Source water assessment area for CITY OF ALBION. (Individual delineations are included in Appendix A).



Map Legend

7 Susceptibility to Potential and Existing Contaminants

7.1 Susceptibility Analysis

CITY OF ALBION's drinking water source(s) were assessed to determine the susceptibility to contamination, or likelihood that the water supply will become contaminated, as part of the CITY OF ALBION source water assessment. Susceptibility scores take into account:

- Construction of the well, spring, or surface water intake
- Land use characteristics above the aquifer and potentially significant contaminant sources
- Hydrologic and geologic conditions surrounding the well, spring, or surface water intake

Susceptibility scores are specific to contaminant categories, including inorganic compounds (IOC), volatile organic compounds (VOC), synthetic organic compounds (SOC), and microbials (M). Each contaminant category is scored as high (H), moderate (M), or low (L). Susceptibility scores for CITY OF ALBION's drinking water sources can be viewed online at www.deq.idaho.gov/water/swaOnline and are listed in Table 3.

Table 3. Susceptibility scores for CITY OF ALBION.

Susceptibility Scores for CITY OF ALBION (PWS# ID5160001)											
		Potential Contaminant Inventory / Land Use					Final Susceptibility Scores			
Source	System Construction	IOC	VOC	SOC	Microbials	Hydrologic Sensitivity	IOC	VOC	SOC	Microbials
WELL #1	M	H	H	H	H	M	High	Moderate	Moderate	Moderate
WELL #2	M	H	H	H	H	M	High	High	High	Auto High
WELL #3	M	H	H	H	H	H	H	H	H	H
	H = high susceptibility, M = moderate susceptibility, L = low susceptibility.									
	Auto High *									

** Auto High - Several situations cause automatic assignment of a high susceptibility score: 1) detection of a contaminant at a concentration greater than the drinking water maximum contaminant level set by EPA, or 2) any detection of a VOC or SOC, or 3) a confirmed microbial detection at the drinking water source, or 4) the presence of potential contaminant sources within 50 feet of a well or 1,000 feet of a surface water intake. Despite the land use of the area, any of these four conditions will trigger an auto high score because a pathway for contamination already exists. Note that MCLs, detections, and potential contaminants can change over time and are not automatically updated in the score.*

7.2 Existing Water Quality Issues

As a regulated public water system under the Safe Drinking Water Act, CITY OF ALBION is required to monitor their water for certain regulated contaminants and report the monitoring results to DEQ. Drinking water commonly contains at least small amounts of contaminants; however, the presence of contaminants, especially those over the maximum contaminant level set by the U.S. Environmental Protection Agency, may pose a risk to public health and signal that a pathway for contamination already exists.

The planning team did not identify any existing water quality concerns in this plan.

7.3 Potential Source of Contamination

Source water, from ground water and surface water sources, can become contaminated from various contaminant sources and land use activities, including both point and nonpoint sources of contamination. Point sources of contamination occur at distinct locations. They are often regulated and require permits or registration for facilities that sell, use, or store those materials (such as chemical storage sheds). Nonpoint sources of contamination often occur over large areas and can result from normal every day activities such as agricultural activities or lawn chemical usage.

A primary inventory of potential point sources of contamination was completed by DEQ for the source water delineation area as part of the source water assessment. The goal of the potential contaminant inventory (PCI) is to locate and describe facilities, land uses, and environmental conditions that are potential sources of contamination so that protection strategies can be identified. It is important to understand that a release may never occur from a listed point or nonpoint source, particularly if best management practices (BMPs) that are designed to reduce contamination risks are used. If a business, facility, or land use activity is identified as a potential contaminant source, it does not mean that they are in violation of any local, state, or federal environmental law or regulation. It does mean that the *potential* for contamination exists due to the nature of the business, industry, or land use activities.

The planning team reviewed and verified the potential contaminant inventory completed by DEQ. The team also evaluated additional potential contaminant sources through an enhanced inventory. A complete list of potential contaminant sources identified are included in Appendix B.

The planning team reviewed the potential contaminants identified through the primary and enhanced inventory and considered other general protection measures in defining priority issues. Table 4 includes the priority issues that the planning team chose to specifically address in this protection plan.

Table 4. Priority issues addressed in this plan.

Priority Issue	Contaminant Type
Education, Outreach, and Public Programs	
Planning	
Regulations and Permits	

8 Source Water Protection Implementation Strategy

Successful source water protection may require a combination of protection measures and implementation strategies. The protection measures identified in this plan are specific to the potential threats to the CITY OF ALBION's drinking water source and are tailored to the needs of the community (Table 5).

Table 5: Management plan and implementation schedule.

Priority Issue	Protection activity	To be completed by	Year	What goal(s) does this address	Additional Information
Year 1					
Education, Outreach, and Public Programs	Marketing: Social Marketing	Isaac Loveland	2021	Increase awareness of the community's drinking water sources and their protection.	Update the website to include section on drinking water protection
Education, Outreach, and Public Programs	Literature	City Clerk	2021	Increase awareness of the community's drinking water sources and their protection.	Drinking water source protection and conservation information to include in monthly bills
Education, Outreach, and Public Programs	Environmental Education	Planning Team	2021	Increase awareness of the community's drinking water sources and their protection.	Edible aquifer and/or ground water model activity in elementary school. Request assistance from DEQ or IRWA.
Education, Outreach, and Public Programs	Source Water Protection Signage	Bryan Day	2021	Increase awareness of the community's drinking water sources and their protection.	Install Source Water Protection Signs
Planning	Comprehensive Plan	City Council	2021	Protect and maintain the quality of Albion's drinking water now and in the future.	Review and update plan and include drinking water / ground water protection.

Priority Issue	Protection activity	To be completed by	Year	What goal(s) does this address	Additional Information
Planning	Facilities Plan and Assessment	Bryan Day	2021	Ensuring adequate water capacity for anticipated demands.	Keller & Assoc. have been contracted to do a facilities planning study through a USDA grant. Study will determine if well #3 should be rehabilitated. Report will provide a list of priorities to protect and maintain the system.
Regulations and Permits	Source Water Protection Ordinance	City Council	2021	Protect and maintain the quality of Albion's drinking water now and in the future.	Review wellhead protection ordinance and update where needed. Compare to Jerry Mason template.
Year 2					
Education, Outreach, and Public Programs	Literature	City Clerk	2022	Increase awareness of the community's drinking water sources and their protection.	Drinking water source protection and conservation information to include in monthly bills
Education, Outreach, and Public Programs	Environmental Education	Planning Team	2022	Increase awareness of the community's drinking water sources and their protection.	Edible aquifer and/or ground water model activity in elementary school. Request assistance from DEQ or IRWA.

Priority Issue	Protection activity	To be completed by	Year	What goal(s) does this address	Additional Information
Planning	Facilities Plan and Assessment	Bryan Day	2022	Ensuring adequate water capacity for anticipated demands.	Keller & Assoc. have been contracted to do a facilities planning study through a USDA grant. Study will determine if well #3 should be rehabilitated. Report will provide a list of priorities to protect and maintain the system.
Regulations and Permits	Source Water Protection Ordinance	City Council	2022	Protect and maintain the quality of Albion's drinking water now and in the future.	Review wellhead protection ordinance and update where needed. Compare to Jerry Mason template.
Year 3					
Education, Outreach, and Public Programs	Literature	City Clerk	2023	Increase awareness of the community's drinking water sources and their protection.	Drinking water source protection and conservation information to include in monthly bills
Education, Outreach, and Public Programs	Environmental Education	Planning Team	2023	Increase awareness of the community's drinking water sources and their protection.	Edible aquifer and/or ground water model activity in elementary school. Request assistance from DEQ or IRWA.
Year 4					

Priority Issue	Protection activity	To be completed by	Year	What goal(s) does this address	Additional Information
Education, Outreach, and Public Programs	Literature	City Clerk	2024	Increase awareness of the community's drinking water sources and their protection.	Drinking water source protection and conservation information to include in monthly bills
Education, Outreach, and Public Programs	Environmental Education	Planning Team	2024	Increase awareness of the community's drinking water sources and their protection.	Edible aquifer and/or ground water model activity in elementary school. Request assistance from DEQ or IRWA.
Year 5					
Education, Outreach, and Public Programs	Literature	City Clerk	2025	Increase awareness of the community's drinking water sources and their protection.	Drinking water source protection and conservation information to include in monthly bills
Education, Outreach, and Public Programs	Environmental Education	Planning Team	2025	Increase awareness of the community's drinking water sources and their protection.	Edible aquifer and/or ground water model activity in elementary school. Request assistance from DEQ or IRWA.
Planning	Source Water Protection Plan	Planning Team	2025	Protect and maintain the quality of Albion's drinking water now and in the future.	Review and update source water protection plan and submit for recertification.
Year 6					
No planned activities					

CITY OF ALBION recognizes that source water protection is an evolving process. As the community begins implementing its source water protection activities, the planning team may need to modify its strategy based on new information, new ideas, and/or increased public input.

Resources may be required to complete source water protection efforts. The planning team will work toward identifying and securing necessary resources to assist with implementing protection measures identified in the table above.

9 Emergency Response Plan

A emergency response plan is a blueprint outlining roles and responsibilities in the event that the water system experiences a disruption due to contamination, loss of power, natural disasters such as drought or flooding, or other circumstances where it cannot provide services. The emergency response plan helps local officials make informed decisions under the most adverse conditions. Developing and implementing a emergency response plan increases the likelihood that correct and immediate action will be taken and that any damage or potential health risk, both in the short and long term, will be minimized.

Regardless of protection efforts to reduce the risk of potential contamination, contamination may still occur as a result of accidental chemical releases, intentional acts of vandalism, or unforeseen results from otherwise legal use of hazardous materials. For this reason, CITY OF ALBION developed a emergency response plan as a guide if such an incident occurs. The emergency response plan is kept on file at the water system and is included in Appendix C.

10 New Drinking Water Sources

CITY OF ALBION anticipates developing a new drinking water source within the next 5 years to meet the needs for increased capacity. CITY OF ALBION will determine the safest location for the new source to protect the drinking water from potential contamination. Once active, the new drinking water source will be delineated and assessed by DEQ to determine the susceptibility of the source to potential contamination. CITY OF ALBION will incorporate the new source into this plan and takes the appropriate actions needed to protect the new source from potential threats of contamination.

References

1. DEQ (Idaho Department of Environmental Quality). 1999. Idaho Source Water Assessment Plan.
2. DEQ (Idaho Department of Environmental Quality). 2000. *Protecting Drinking Water Sources in Idaho.*
3. DEQ (Idaho Department of Environmental Quality). CITY OF ALBION (ID5160001) *Source Water Assessment Report.* www.deq.idaho.gov/water/swaOnline

APPENDIXES

Appendix A - Delineations (/water/swpp/ProtectionPlan/Appendix/47?code=A)
Appendix B - PCI table (/water/swpp/ProtectionPlan/Appendix/47?code=B)
Appendix C - Emergency Response Plan (/water/swpp/ContingencyPlan/Download/30?docType=pdf)

To save plan as pdf, please click Print Preview, Choose either Print Plan Alone or Print Plan Including Appendix. Once document loads, either download as pdf or right click and save as Adobe Acrobat Document.

Please note that maps do not load when plans are downloaded as a Word document.

National Primary Drinking Water Regulations

Contaminant		MCL or TT[1] (mg/L)[2]	Potential health effects from long-term[3] exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal (mg/L)[2]
OC	Acrylamide	TT[4]	Nervous system or blood problems; increased risk of cancer	Added to water during sewage/ wastewater treatment	zero
OC	Alachlor	0.002	Eye, liver, kidney or spleen problems; anemia; increased risk of cancer	Runoff from herbicide used on row crops	zero
R	Alpha/photon emitters	15 picocuries per Liter (pCi/L)	Increased risk of cancer	Erosion of natural deposits of certain minerals that are radioactive and may emit a form of radiation known as alpha radiation	zero
IOC	Antimony	0.006	Increase in blood cholesterol; decrease in blood sugar	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder	0.006
IOC	Arsenic	0.010	Skin damage or problems with circulatory systems, and may have increased risk of getting cancer	Erosion of natural deposits; runoff from orchards; runoff from glass & electronics production wastes	0
IOC	Asbestos (fibers >10 micrometers)	7 million fibers per Liter (MFL)	Increased risk of developing benign intestinal polyps	Decay of asbestos cement in water mains; erosion of natural deposits	7 MFL
OC	Atrazine	0.003	Cardiovascular system or reproductive problems	Runoff from herbicide used on row crops	0.003
IOC	Barium	2	Increase in blood pressure	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits	2
OC	Benzene	0.005	Anemia; decrease in blood platelets; increased risk of cancer	Discharge from factories; leaching from gas storage tanks and landfills	zero
OC	Benzo(a)pyrene (PAHs)	0.0002	Reproductive difficulties; increased risk of cancer	Leaching from linings of water storage tanks and distribution lines	zero
IOC	Beryllium	0.004	Intestinal lesions	Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries	0.004
R	Beta photon emitters	4 millirems per year	Increased risk of cancer	Decay of natural and man-made deposits of certain minerals that are radioactive and may emit forms of radiation known as photons and beta radiation	zero
DBP	Bromate	0.010	Increased risk of cancer	Byproduct of drinking water disinfection	zero
IOC	Cadmium	0.005	Kidney damage	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints	0.005
OC	Carbofuran	0.04	Problems with blood, nervous system, or reproductive system	Leaching of soil fumigant used on rice and alfalfa	0.04
OC	Carbon tetrachloride	0.005	Liver problems; increased risk of cancer	Discharge from chemical plants and other industrial activities	zero
D	Chloramines (as Cl_2)	MRDL=4.0[1]	Eye/nose irritation; stomach discomfort; anemia	Water additive used to control microbes	MRDLG=4[1]
OC	Chlordane	0.002	Liver or nervous system problems; increased risk of cancer	Residue of banned termiticide	zero
D	Chlorine (as Cl_2)	MRDL=4.0[1]	Eye/nose irritation; stomach discomfort	Water additive used to control microbes	MRDLG=4[1]
D	Chlorine dioxide (as ClO_2)	MRDL=0.8[1]	Anemia; infants, young children, and fetuses of pregnant women: nervous system effects	Water additive used to control microbes	MRDLG=0.8[1]
DBP	Chlorite	1.0	Anemia; infants, young children, and fetuses of pregnant women: nervous system effects	Byproduct of drinking water disinfection	0.8
OC	Chlorobenzene	0.1	Liver or kidney problems	Discharge from chemical and agricultural chemical factories	0.1
IOC	Chromium (total)	0.1	Allergic dermatitis	Discharge from steel and pulp mills; erosion of natural deposits	0.1
IOC	Copper	TT[5]; Action Level = 1.3	Short-term exposure: Gastrointestinal distress. Long-term exposure: Liver or kidney damage. People with Wilson's Disease should consult their personal doctor if the amount of copper in their water exceeds the action level	Corrosion of household plumbing systems; erosion of natural deposits	1.3
M	*Cryptosporidium*	TT[7]	Short-term exposure: Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste	zero

LEGEND

D Disinfectant	IOC Inorganic Chemical	OC Organic Chemical
DBP Disinfection Byproduct	M Microorganism	R Radionuclides

Contaminant		MCL or TT[1] (mg/L)[2]	Potential health effects from long-term[3] exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal (mg/L)[2]
IOC	Cyanide (as free cyanide)	0.2	Nerve damage or thyroid problems	Discharge from steel/metal factories; discharge from plastic and fertilizer factories	0.2
OC	2,4-D	0.07	Kidney, liver, or adrenal gland problems	Runoff from herbicide used on row crops	0.07
OC	Dalapon	0.2	Minor kidney changes	Runoff from herbicide used on rights of way	0.2
OC	1,2-Dibromo-3-chloropropane (DBCP)	0.0002	Reproductive difficulties; increased risk of cancer	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards	zero
OC	o-Dichlorobenzene	0.6	Liver, kidney, or circulatory system problems	Discharge from industrial chemical factories	0.6
OC	p-Dichlorobenzene	0.075	Anemia; liver, kidney or spleen damage; changes in blood	Discharge from industrial chemical factories	0.075
OC	1,2-Dichloroethane	0.005	Increased risk of cancer	Discharge from industrial chemical factories	zero
OC	1,1-Dichloroethylene	0.007	Liver problems	Discharge from industrial chemical factories	0.007
OC	cis-1,2-Dichloroethylene	0.07	Liver problems	Discharge from industrial chemical factories	0.07
OC	trans-1,2-Dichloroethylene	0.1	Liver problems	Discharge from industrial chemical factories	0.1
OC	Dichloromethane	0.005	Liver problems; increased risk of cancer	Discharge from drug and chemical factories	zero
OC	1,2-Dichloropropane	0.005	Increased risk of cancer	Discharge from industrial chemical factories	zero
OC	Di(2-ethylhexyl) adipate	0.4	Weight loss, liver problems, or possible reproductive difficulties	Discharge from chemical factories	0.4
OC	Di(2-ethylhexyl) phthalate	0.006	Reproductive difficulties; liver problems; increased risk of cancer	Discharge from rubber and chemical factories	zero
OC	Dinoseb	0.007	Reproductive difficulties	Runoff from herbicide used on soybeans and vegetables	0.007
OC	Dioxin (2,3,7,8-TCDD)	0.00000003	Reproductive difficulties; increased risk of cancer	Emissions from waste incineration and other combustion; discharge from chemical factories	zero
OC	Diquat	0.02	Cataracts	Runoff from herbicide use	0.02
OC	Endothall	0.1	Stomach and intestinal problems	Runoff from herbicide use	0.1
OC	Endrin	0.002	Liver problems	Residue of banned insecticide	0.002
OC	Epichlorohydrin	TT[4]	Increased cancer risk; stomach problems	Discharge from industrial chemical factories; an impurity of some water treatment chemicals	zero
OC	Ethylbenzene	0.7	Liver or kidney problems	Discharge from petroleum refineries	0.7
OC	Ethylene dibromide	0.00005	Problems with liver, stomach, reproductive system, or kidneys; increased risk of cancer	Discharge from petroleum refineries	zero
M	Fecal coliform and *E. coli*	MCL[6]	Fecal coliforms and *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes may cause short term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, and people with severely compromised immune systems.	Human and animal fecal waste	zero[6]
IOC	Fluoride	4.0	Bone disease (pain and tenderness of the bones); children may get mottled teeth	Water additive which promotes strong teeth; erosion of natural deposits; discharge from fertilizer and aluminum factories	4.0
M	*Giardia lamblia*	TT[7]	Short-term exposure: Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste	zero
OC	Glyphosate	0.7	Kidney problems; reproductive difficulties	Runoff from herbicide use	0.7
DBP	Haloacetic acids (HAA5)	0.060	Increased risk of cancer	Byproduct of drinking water disinfection	n/a[9]
OC	Heptachlor	0.0004	Liver damage; increased risk of cancer	Residue of banned termiticide	zero
OC	Heptachlor epoxide	0.0002	Liver damage; increased risk of cancer	Breakdown of heptachlor	zero
M	Heterotrophic plate count (HPC)	TT[7]	HPC has no health effects; it is an analytic method used to measure the variety of bacteria that are common in water. The lower the concentration of bacteria in drinking water, the better maintained the water system is.	HPC measures a range of bacteria that are naturally present in the environment	n/a

LEGEND

D Disinfectant	IOC Inorganic Chemical	OC Organic Chemical
DBP Disinfection Byproduct	M Microorganism	R Radionuclides

Contaminant		MCL or TT[1] (mg/L)[2]	Potential health effects from long-term[3] exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal (mg/L)[2]
OC	Hexachlorobenzene	0.001	Liver or kidney problems; reproductive difficulties; increased risk of cancer	Discharge from metal refineries and agricultural chemical factories	zero
OC	Hexachlorocyclopentadiene	0.05	Kidney or stomach problems	Discharge from chemical factories	0.05
IOC	Lead	TT5; Action Level=0.015	Infants and children: Delays in physical or or mental development; children could show slight deficits in attention span and learning abilities; Adults: Kidney problems; high blood pressure	Corrosion of household plumbing systems; erosion of natural deposits	zero
M	*Legionella*	TT7	Legionnaire's Disease, a type of pneumonia	Found naturally in water; multiplies in heating systems	zero
OC	Lindane	0.0002	Liver or kidney problems	Runoff/leaching from insecticide used on cattle, lumber, gardens	0.0002
IOC	Mercury (inorganic)	0.002	Kidney damage	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills and croplands	0.002
OC	Methoxychlor	0.04	Reproductive difficulties	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock	0.04
IOC	Nitrate (measured as Nitrogen)	10	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits	10
IOC	Nitrite (measured as Nitrogen)	1	Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits	1
OC	Oxamyl (Vydate)	0.2	Slight nervous system effects	Runoff/leaching from insecticide used on apples, potatoes, and tomatoes	0.2
OC	Pentachlorophenol	0.001	Liver or kidney problems; increased cancer risk	Discharge from wood-preserving factories	zero
OC	Picloram	0.5	Liver problems	Herbicide runoff	0.5
OC	Polychlorinated biphenyls (PCBs)	0.0005	Skin changes; thymus gland problems; immune deficiencies; reproductive or nervous system difficulties; increased risk of cancer	Runoff from landfills; discharge of waste chemicals	zero
R	Radium 226 and Radium 228 (combined)	5 pCi/L	Increased risk of cancer	Erosion of natural deposits	zero
IOC	Selenium	0.05	Hair or fingernail loss; numbness in fingers or toes; circulatory problems	Discharge from petroleum and metal refineries; erosion of natural deposits; discharge from mines	0.05
OC	Simazine	0.004	Problems with blood	Herbicide runoff	0.004
OC	Styrene	0.1	Liver, kidney, or circulatory system problems	Discharge from rubber and plastic factories; leaching from landfills	0.1
OC	Tetrachloroethylene	0.005	Liver problems; increased risk of cancer	Discharge from factories and dry cleaners	zero
IOC	Thallium	0.002	Hair loss; changes in blood; kidney, intestine, or liver problems	Leaching from ore-processing sites; discharge from electronics, glass, and drug factories	0.0005
OC	Toluene	1	Nervous system, kidney, or liver problems	Discharge from petroleum factories	1
M	Total Coliforms	5.0 percent[8]	Coliforms are bacteria that indicate that other, potentially harmful bacteria may be present. See fecal coliforms and *E. coli*	Naturally present in the environment	zero
DBP	Total Trihalomethanes (TTHMs)	0.080	Liver, kidney or central nervous system problems; increased risk of cancer	Byproduct of drinking water disinfection	n/a[9]
OC	Toxaphene	0.003	Kidney, liver, or thyroid problems; increased risk of cancer	Runoff/leaching from insecticide used on cotton and cattle	zero
OC	2,4,5-TP (Silvex)	0.05	Liver problems	Residue of banned herbicide	0.05
OC	1,2,4-Trichlorobenzene	0.07	Changes in adrenal glands	Discharge from textile finishing factories	0.07
OC	1,1,1-Trichloroethane	0.2	Liver, nervous system, or circulatory problems	Discharge from metal degreasing sites and other factories	0.2
OC	1,1,2-Trichloroethane	0.005	Liver, kidney, or immune system problems	Discharge from industrial chemical factories	0.003
OC	Trichloroethylene	0.005	Liver problems; increased risk of cancer	Discharge from metal degreasing sites and other factories	zero

LEGEND

D	Disinfectant
DBP	Disinfection Byproduct
IOC	Inorganic Chemical
M	Microorganism
OC	Organic Chemical
R	Radionuclides

Contaminant		MCL or TT[1] (mg/L)[2]	Potential health effects from long-term[3] exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal (mg/L)[2]
M	Turbidity	TT[7]	Turbidity is a measure of the cloudiness of water. It is used to indicate water quality and filtration effectiveness (e.g., whether disease-causing organisms are present). Higher turbidity levels are often associated with higher levels of disease-causing microorganisms such as viruses, parasites and some bacteria. These organisms can cause short term symptoms such as nausea, cramps, diarrhea, and associated headaches.	Soil runoff	n/a
R	Uranium	30µg/L	Increased risk of cancer, kidney toxicity	Erosion of natural deposits	zero
OC	Vinyl chloride	0.002	Increased risk of cancer	Leaching from PVC pipes; discharge from plastic factories	zero
M	Viruses (enteric)	TT[7]	Short-term exposure: Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste	zero
OC	Xylenes (total)	10	Nervous system damage	Discharge from petroleum factories; discharge from chemical factories	10

LEGEND

D Disinfectant
DBP Disinfection Byproduct
IOC Inorganic Chemical
M Microorganism
OC Organic Chemical
R Radionuclides

NOTES

1 Definitions

- Maximum Contaminant Level Goal (MCLG)—The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety and are non-enforceable public health goals.
- Maximum Contaminant Level (MCL)—The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.
- Maximum Residual Disinfectant Level Goal (MRDLG)—The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
- Maximum Residual Disinfectant Level (MRDL)—The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
- Treatment Technique (TT)—A required process intended to reduce the level of a contaminant in drinking water.

2 Units are in milligrams per liter (mg/L) unless otherwise noted. Milligrams per liter are equivalent to parts per million (ppm).

3 Health effects are from long-term exposure unless specified as short-term exposure.

4 Each water system must certify annually, in writing, to the state (using third-party or manufacturers certification) that when it uses acrylamide and/or epichlorohydrin to treat water, the combination (or product) of dose and monomer level does not exceed the levels specified, as follows: Acrylamide = 0.05 percent dosed at 1 mg/L (or equivalent); Epichlorohydrin = 0.01 percent dosed at 20 mg/L (or equivalent).

5 Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water. If more than 10 percent of tap water samples exceed the action level, water systems must take additional steps. For copper, the action level is 1.3 mg/L, and for lead is 0.015 mg/L.

6 A routine sample that is fecal coliform-positive or *E. coli*-positive triggers repeat samples--if any repeat sample is total coliform-positive, the system has an acute MCL violation. A routine sample that is total coliform-positive and fecal coliform-negative or *E. coli*-negative triggers repeat samples--if any repeat sample is fecal coliform-positive or *E. coli*-positive, the system has an acute MCL violation. See also Total Coliforms.

7 EPA's surface water treatment rules require systems using surface water or ground water under the direct influence of surface water to (1) disinfect their water, and (2) filter their water or meet criteria for avoiding filtration so that the following contaminants are controlled at the following levels:

- *Cryptosporidium*: 99 percent removal for systems that filter. Unfiltered systems are required to include Cryptosporidium in their existing watershed control provisions.
- Giardia lamblia: 99.9 percent removal/inactivation
- Viruses: 99.99 percent removal/inactivation
- *Legionella*: No limit, but EPA believes that if *Giardia* and viruses are removed/inactivated according to the treatment techniques in the surface water treatment rule, *Legionella* will also be controlled.
- Turbidity: For systems that use conventional or direct filtration, at no time can turbidity (cloudiness of water) go higher than 1 nephelolometric turbidity unit (NTU), and samples for turbidity must be less than or equal to 0.3 NTU in at least 95 percent of the samples in any month. Systems that use filtration other than conventional or direct filtration must follow state limits, which must include turbidity at no time exceeding 5 NTU.
- HPC: No more than 500 bacterial colonies per milliliter
- Long Term 1 Enhanced Surface Water Treatment; Surface water systems or ground water systems under the direct influence of surface water serving fewer than 10,000 people must comply with the applicable Long Term 1 Enhanced Surface Water Treatment Rule provisions (e.g. turbidity standards, individual filter monitoring, *Cryptosporidium* removal requirements, updated watershed control requirements for unfiltered systems).
- Long Term 2 Enhanced Surface Water Treatment; This rule applies to all surface water systems or ground water systems under the direct influence of surface water. The rule targets additional *Cryptosporidium* treatment requirements for higher risk systems and includes provisions to reduce risks from uncovered finished water storages facilities and to ensure that the systems maintain microbial protection as they take steps to reduce the formation of disinfection byproducts. (Monitoring start dates are staggered by system size. The largest systems (serving at least 100,000 people) will begin monitoring in October 2006 and the smallest systems (serving fewer than 10,000 people) will not begin monitoring until October 2008. After completing monitoring and determining their treatment bin, systems generally have three years to comply with any additional treatment requirements.)
- Filter Backwash Recycling: The Filter Backwash Recycling Rule requires systems that recycle to return specific recycle flows through all processes of the system's existing conventional or direct filtration system or at an alternate location approved by the state.

8 No more than 5.0 percent samples total coliform-positive in a month. (For water systems that collect fewer than 40 routine samples per month, no more than one sample can be total coliform-positive per month.) Every sample that has total coliform must be analyzed for either fecal coliforms or *E. coli*. If two consecutive TC-positive samples, and one is also positive for *E. coli* or fecal coliforms, system has an acute MCL violation.

9 Although there is no collective MCLG for this contaminant group, there are individual MCLGs for some of the individual contaminants:

- Haloacetic acids: dichloroacetic acid (zero); trichloroacetic acid (0.3 mg/L)
- Trihalomethanes: bromodichloromethane (zero); bromoform (zero); dibromochloromethane (0.06 mg/L)

National Secondary Drinking Water Regulation

National Secondary Drinking Water Regulations are non-enforceable guidelines regarding contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. EPA recommends secondary standards to water systems but does not require systems to comply. However, some states may choose to adopt them as enforceable standards.

Contaminant	Secondary Maximum Contaminant Level
Aluminum	0.05 to 0.2 mg/L
Chloride	250 mg/L
Color	15 (color units)
Copper	1.0 mg/L
Corrosivity	noncorrosive
Fluoride	2.0 mg/L
Foaming Agents	0.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Odor	3 threshold odor number
pH	6.5-8.5
Silver	0.10 mg/L
Sulfate	250 mg/L
Total Dissolved Solids	500 mg/L
Zinc	5 mg/L

For More Information

EPA's Safe Drinking Water Web site:
http://www.epa.gov/safewater/

EPA's Safe Drinking Water Hotline:
(800) 426-4791

To order additional posters or other ground water and drinking water publications, please contact the National Service Center for Environmental Publications at :
(800) 490-9198, or
email: nscep@bps-lmit.com.

EPA United States Environmental Protection Agency

EPA 816-F-09-004
May 2009

DEQ Public Drinking Water System
Monitoring Schedule Report
Print Date: March 26, 2020

ID5160001 - ALBION CITY OF
Community water system serving 310 people and 151 connections.
Regulated by: TWIN FALLS REGIONAL OFFICE

The following schedules include monitoring periods between 1-1-2020 and 12-31-2028

Schedules for Distribution System(s)

Code	Group/Analyte Name	Monitoring Frequency	Season Begin Date	Season End Date	Satisfied
3100	COLIFORM (TCR)	1 per MN	1/1	12/31	Monthly
DBP2	DBP2-STAGE 2	1 per 3Y due in 2022 taken 7/1 through 9/30 1 set TTHM/HAA5 - 550 SOUTH MAIN (DBP2A)	7/1	9/30	*FUTURE
DBP2	DBP2-STAGE 2	1 per 3Y due in 2025 taken 7/1 through 9/30 1 set TTHM/HAA5 - 550 SOUTH MAIN (DBP2A)	7/1	9/30	*FUTURE

Schedules for Distribution Systems(s) Lead and Copper

Code	Group/Analyte Name	Monitoring Frequency	Season Begin Date	Season End Date	Satisfied
PBCU	LCR - LEAD COPPER	5 per 3Y collected in 2022 taken 6/1 through 9/30	6/1	9/30	*FUTURE
PBCU	LCR - LEAD COPPER	5 per 3Y collected in 2025 taken 6/1 through 9/30	6/1	9/30	*FUTURE

Note: Consumer notice of lead tap results, regardless of lead level, is required within 30 days after receiving results. For templates and more information, please visit:
http://www.deq.idaho.gov/water-quality/drinking-water/pws-monitoring-reporting/public-notifications

Schedules for tag#: E0007566
Please Label Sampling Point/Location as: "WELL #1"

Code	Group/Analyte Name	Monitoring Frequency	Season Begin Date	Season End Date	Satisfied
ZNO3	NITRATE	1 per YR due between 01/01/2020 and 12/31/2020	n/a	n/a	NO
ZNO3	NITRATE	1 per YR due between 01/01/2021 and 12/31/2021	n/a	n/a	*FUTURE
ZNO2	NITRITE	1 per 9Y due between 01/01/2014 and 12/31/2022	n/a	n/a	NO
VOCS	VOCS - GROUP	1 per 6Y due between 01/01/2017 and 12/31/2022	n/a	n/a	NO
ALFA	RADS - GROSS ALPHA	1 per 6Y due between 01/01/2017 and 12/31/2022	n/a	n/a	YES
SODI	IOC - SODIUM	1 per 3Y due between 01/01/2020 and 12/31/2022	n/a	n/a	NO
ZIOC	IOCS - PHASE 2 AND 5	1 per 3Y due between 01/01/2020 and 12/31/2022	n/a	n/a	NO
ZNO3	NITRATE	1 per YR due between 01/01/2022 and 12/31/2022	n/a	n/a	*FUTURE
ZNO3	NITRATE	1 per YR due between 01/01/2023 and 12/31/2023	n/a	n/a	*FUTURE
ZNO3	NITRATE	1 per YR due between 01/01/2024 and 12/31/2024	n/a	n/a	*FUTURE
ZIOC	IOCS - PHASE 2 AND 5	1 per 3Y due between 01/01/2023 and 12/31/2025	n/a	n/a	*FUTURE
SODI	IOC - SODIUM	1 per 3Y due between 01/01/2023 and 12/31/2025	n/a	n/a	*FUTURE
ZNO3	NITRATE	1 per YR due between 01/01/2025 and 12/31/2025	n/a	n/a	*FUTURE
ZNO3	NITRATE	1 per YR due between 01/01/2026 and 12/31/2026	n/a	n/a	*FUTURE
URAN	RADS - URANIUM	1 per 9Y due between 01/01/2020 and 12/31/2028	n/a	n/a	NO
R226	RADS - RADIUM 226	1 per 9Y due between 01/01/2020 and 12/31/2028	n/a	n/a	NO
R228	RADS - RADIUM 228	1 per 9Y due between 01/01/2020 and 12/31/2028	n/a	n/a	NO
ZARS	ARSENIC (1005)	1 per 9Y due between 01/01/2020 and 12/31/2028	n/a	n/a	NO
ZFLU	IOC - FLUORIDE	1 per 9Y due between 01/01/2020 and 12/31/2028	n/a	n/a	NO
VOCS	VOCS - GROUP	1 per 6Y due between 01/01/2023 and 12/31/2028	n/a	n/a	*FUTURE
ALFA	RADS - GROSS ALPHA	1 per 6Y due between 01/01/2023 and 12/31/2028	n/a	n/a	*FUTURE

Schedules for tag#: E0007567
Please Label Sampling Point/Location as: "WELL #2"

Code	Group/Analyte Name	Monitoring Frequency	Season Begin Date	Season End Date	Satisfied
ZNO3	NITRATE	1 per YR due between 01/01/2020 and 12/31/2020	n/a	n/a	NO
ZNO3	NITRATE	1 per YR due between 01/01/2021 and 12/31/2021	n/a	n/a	*FUTURE
ZNO2	NITRITE	1 per 9Y due between 01/01/2014 and 12/31/2022	n/a	n/a	NO
URAN	RADS - URANIUM	1 per 6Y due between 01/01/2017 and 12/31/2022	n/a	n/a	NO
VOCS	VOCS - GROUP	1 per 6Y due between 01/01/2017 and 12/31/2022	n/a	n/a	NO
SOCS	SOCS - GROUP	1 per 3Y due between 01/01/2020 and 12/31/2022	n/a	n/a	NO
SODI	IOC - SODIUM	1 per 3Y due between 01/01/2020 and 12/31/2022	n/a	n/a	NO
ZNO3	NITRATE	1 per YR due between 01/01/2022 and 12/31/2022	n/a	n/a	*FUTURE
ZNO3	NITRATE	1 per YR due between 01/01/2023 and 12/31/2023	n/a	n/a	*FUTURE
ZNO3	NITRATE	1 per YR due between 01/01/2024 and 12/31/2024	n/a	n/a	*FUTURE
R226	RADS - RADIUM 226	1 per 9Y due between 01/01/2017 and 12/31/2025	n/a	n/a	NO
R228	RADS - RADIUM 228	1 per 9Y due between 01/01/2017 and 12/31/2025	n/a	n/a	NO
ALFA	RADS - GROSS ALPHA	1 per 6Y due between 01/01/2020 and 12/31/2025	n/a	n/a	NO
SODI	IOC - SODIUM	1 per 3Y due between 01/01/2023 and 12/31/2025	n/a	n/a	*FUTURE
SOCS	SOCS - GROUP	1 per 3Y due between 01/01/2023 and 12/31/2025	n/a	n/a	*FUTURE
ZNO3	NITRATE	1 per YR due between 01/01/2025 and 12/31/2025	n/a	n/a	*FUTURE
ZNO3	NITRATE	1 per YR due between 01/01/2026 and 12/31/2026	n/a	n/a	*FUTURE
ZARS	ARSENIC (1005)	1 per 9Y due between 01/01/2020 and 12/31/2028	n/a	n/a	NO
ZFLU	IOC - FLUORIDE	1 per 9Y due between 01/01/2020 and 12/31/2028	n/a	n/a	NO
ZIOC	IOCS - PHASE 2 AND 5	1 per 9Y due between 01/01/2020 and 12/31/2028	n/a	n/a	NO
VOCS	VOCS - GROUP	1 per 6Y due between 01/01/2023 and 12/31/2028	n/a	n/a	*FUTURE
URAN	RADS - URANIUM	1 per 6Y due between 01/01/2023 and 12/31/2028	n/a	n/a	*FUTURE

"*FUTURE" in the "Satisfied" column indicates the sampling requirement begins sometime in the future. Sampling before the monitoring period begin date will not satisfy the requirement for the monitoring period.

"*See CO" in the "Satisfied" column indicates the operator needs to contact his or her compliance officer (CO) to verify that samples have been taken and the schedule has been satisfied.

IMPORTANT NOTICE: This monitoring schedule is provided to you as a courtesy and is current as of March 26, 2020 Surface water systems and systems that are disinfecting have additional sampling that is not reflected in this monitoring schedule report. This monitoring schedule may be changed or modified as needed. This monitoring schedule does not show past unfulfilled schedules for which violations may exist. Please revisit the monitoring schedule tool and review the system's monitoring schedule prior to sampling to ensure compliance with the most current monitoring requirements. Contact your public water system regulating agency if you have any questions.

When more than one year is selected for the search criteria, schedules due in 2020 will be highlighted.

Chemical And Radiological Violation History

PWS Number: ID5160001
PWS Name: ALBION CITY OF
Total Records: 0

Monitoring violations are violations that occurred because a system failed to complete a required contaminant sampling (which means the system failed to "monitor" or sample for a contaminant).

MCL (maximum contaminant level) violations are violations that occurred because the level of the completed sampling was higher than allowed, or higher than the MCL (maximum contaminant level).

If the chemical monitoring report shows no results, then the system has no chemical violations for the last (2020) calendar year.

No results were found for the Chemical And Radiological Violation History Report.

Note: Please notify your regional DEQ office if you find discrepancies in your sampling or violation histories. DEQ will correct the errors in the agency's database.

Coliform Violation History

PWS Number: ID5160001
PWS Name: ALBION CITY OF
Total Records: 0

Monitoring violations are violations that occurred because a system failed to complete a required contaminant sampling (which means the system failed to "monitor" or sample for a contaminant).

MCL (maximum contaminant level) violations are violations that occurred because the level of the completed sampling was higher than allowed, or higher than the MCL (maximum contaminant level).

If the coliform monitoring report shows no results, then the system has no coliform violations for the last (2020) calendar year.

No results were found for the Coliform Violation History Report.

Note: Please notify your regional DEQ office if you find discrepancies in your sampling or violation histories. DEQ will correct the errors in the agency's database.

Lead And Copper Violation History

PWS Number: ID5160001
PWS Name: ALBION CITY OF
Total Records: 0

If your system has a violation listed below, it means that your system was required to sample for lead and copper during calendar year 2020, but failed to do so during the appropriate time period. These violations must be reported in the CCR as a failure to monitor.

If the lead and copper monitoring violations report shows no results (Total Records: 0), then the system has no lead and copper monitoring violations for the last (2020) calendar year.

No results were found for the Lead And Copper Violation History Report.

Note: Please notify your regional DEQ office if you find discrepancies in your sampling or violation histories. DEQ will correct the errors in the agency's database.

DBP Violation History

PWS Number: ID5160001
PWS Name: ALBION CITY OF
Total Records: 0

This report only applies to systems practicing chlorination and/or filtration.

Monitoring violations are violations that occurred because a system failed to complete a required contaminant sampling (which means the system failed to "monitor" or sample for a contaminant).

MCL (maximum contaminant level) violations are violations that occurred because the level of the completed sampling was higher than allowed, or higher than the MCL (maximum contaminant level).

If the DBP monitoring violations report shows no results, then the system has no disinfection byproduct violations for the last (2020) calendar year.

No results were found for the DBP Violation History Report.

Note: Please notify your regional DEQ office if you find discrepancies in your sampling or violation histories. DEQ will correct the errors in the agency's database.

SWTR and MRDL Violation History

PWS Number: ID5160001
PWS Name: ALBION CITY OF
Total Records: 0

This report only applies to systems practicing chlorination and/or filtration.

Violations listed are either treatment techniques or failure to monitor violations. Violation Type "TT" designates a treatment technique violation; violation type "MON" designates a monitoring violation.

If no records are displayed, the system did not accrue any applicable violations during the previous calendar year.

For your information - definitions of abbreviations found in the "Requirements" column:

EPRD: "entry point residual disinfection" level either not met or not reported.
DSRD: "distribution system residual disinfection" level either not met or not reported.
95PT: "95 percentile" (95%) turbidity level either exceeded or not reported.
MAXT: "maximum turbidity" level either exceeded or not reported.

No results were found for the SWTR and MRDL Violation History Report.

Note: Please notify your regional DEQ office if you find discrepancies in your sampling or violation histories. DEQ will correct the errors in the agency's database.

Sanitary Survey Significant Deficiency Violation History

PWS Number: ID5160001
PWS Name: ALBION CITY OF
Total Records: 0

This report identifies violations generated from unaddressed significant deficiencies and failing to consult with the state to produce a compliance schedule.

If the Sanitary Survey Significant Deficiency violations report shows no results, then the system has no significant deficiency violations for the last (2020) calendar year.

No results were found for the Sanitary Survey Significant Deficiency Violation History Report.

Note: Please notify your regional DEQ office if you find discrepancies in your sampling or violation histories. DEQ will correct the errors in the agency's database.

Public Notification Violation History

PWS Number: ID5160001
PWS Name: ALBION CITY OF
Total Records: 0

This report identifies violations generated from failing to deliver public notification to the public in accordance with the public notification schedule.

If the Public Notification violation history report shows no results, then the system has no public notification violations for the last (2020) calendar year.

No results were found for the Public Notification Violation History Report.

Note: Please notify your regional DEQ office if you find discrepancies in your sampling or violation histories. DEQ will correct the errors in the agency's database.

Chemical And Radiological Sampling History

PWS Number: ID5160001
PWS Name: ALBION CITY OF
Total Records: 183

A PWS is only required to report the most recent detections of any contaminant at each representative sampling location. For example, if nitrate is detected in a sample collected at Well X in 2019, but is not detected at Well X in 2020, then the system is not required to report nitrate for Well X in the 2020 CCR. **Note:** If a contaminant (e.g., nitrate) is listed with a "Y" (meaning "Yes") in the "non-detect" column, this means that sampling results showed a "non-detect" - that is to say, nitrate was not detected.

Required Language. If a system reports a detection, the system must give the major sources of the contaminant. To report this information, go to **Appendix A of the CCR template**, find the contaminant, and copy the information from the *"Major Sources in Drinking Water"* column and place it in your CCR. If the system exceeds the MCL (maximum contaminant level) value of a contaminant, the system must show the potential health effects of the contaminant. To report this information, go to **Appendix A of the CCR template** , find the contaminant, and copy the information from the *"Health Effects Language"* column and place it in your CCR.

Abbreviations used below:
MG/L (mg/L) = milligrams per liter (mg/L = ppm in Appendix A)
UG/L (µg/L) = micrograms per liter (µg/L = ppb in Appendix A)
PIC/L (pCi/L) = picocuries per liter

Contaminant	Date Collected	Facility	Non Detect?	Detected Level	Units	CCR Units
1,1,1-TRICHLOROETHANE	06/09/2016	WELL #1	Y	0.000		0.000
1,1,1-TRICHLOROETHANE	06/09/2016	WELL #2	Y	0.000		0.000
1,1,2-TRICHLOROETHANE	06/09/2016	WELL #1	Y	0.000		0.000
1,1,2-TRICHLOROETHANE	06/09/2016	WELL #2	Y	0.000		0.000
1,1-DICHLOROETHYLENE	06/09/2016	WELL #1	Y	0.000		0.000
1,1-DICHLOROETHYLENE	06/09/2016	WELL #2	Y	0.000		0.000
1,2,4-TRICHLOROBENZENE	06/09/2016	WELL #1	Y	0.000		0.000
1,2,4-TRICHLOROBENZENE	06/09/2016	WELL #2	Y	0.000		0.000
1,2-DIBROMO-3-CHLOROPROPANE	11/12/2019	WELL #2	Y	0.000		0.000
1,2-DIBROMO-3-CHLOROPROPANE	06/09/2016	WELL #1	Y	0.000		0.000
1,2-DIBROMO-3-CHLOROPROPANE	06/09/2016	WELL #2	Y	0.000		0.000
1,2-DICHLOROETHANE	06/09/2016	WELL #1	Y	0.000		0.000
1,2-DICHLOROETHANE	06/09/2016	WELL #2	Y	0.000		0.000
1,2-DICHLOROPROPANE	06/09/2016	WELL #1	Y	0.000		0.000
1,2-DICHLOROPROPANE	06/09/2016	WELL #2	Y	0.000		0.000
2,4,5-TP	11/12/2019	WELL #2	Y	0.000		0.000
2,4,5-TP	06/09/2016	WELL #1	Y	0.000		0.000
2,4,5-TP	06/09/2016	WELL #2	Y	0.000		0.000
2,4-D	11/12/2019	WELL #2	Y	0.000		0.000
2,4-D	06/09/2016	WELL #1	Y	0.000		0.000
2,4-D	06/09/2016	WELL #2	Y	0.000		0.000
ANTIMONY, TOTAL	05/06/2019	WELL #1	Y	0.000		0.000
ANTIMONY, TOTAL	05/06/2019	WELL #2	Y	0.000		0.000
ANTIMONY, TOTAL	06/09/2016	WELL #1	Y	0.000		0.000
ARSENIC	05/06/2019	WELL #1	N	0.003	MG/L	3.000
ARSENIC	05/06/2019	WELL #2	N	0.002	MG/L	2.000
ATRAZINE	11/12/2019	WELL #2	Y	0.000		0.000
ATRAZINE	06/09/2016	WELL #1	Y	0.000		0.000
ATRAZINE	06/09/2016	WELL #2	Y	0.000		0.000
BARIUM	05/06/2019	WELL #1	N	0.200	MG/L	0.200
BARIUM	05/06/2019	WELL #2	N	0.180	MG/L	0.180
BARIUM	06/09/2016	WELL #1	N	0.168	MG/L	0.168
BENZENE	06/09/2016	WELL #1	Y	0.000		0.000
BENZENE	06/09/2016	WELL #2	Y	0.000		0.000
BENZO(A)PYRENE	11/12/2019	WELL #2	Y	0.000		0.000
BENZO(A)PYRENE	06/09/2016	WELL #1	Y	0.000		0.000
BENZO(A)PYRENE	06/09/2016	WELL #2	Y	0.000		0.000
BERYLLIUM, TOTAL	05/06/2019	WELL #1	Y	0.000		0.000
BERYLLIUM, TOTAL	05/06/2019	WELL #2	Y	0.000		0.000
BERYLLIUM, TOTAL	06/09/2016	WELL #1	Y	0.000		0.000
BHC-GAMMA	11/12/2019	WELL #2	Y	0.000		0.000
BHC-GAMMA	06/09/2016	WELL #1	Y	0.000		0.000
BHC-GAMMA	06/09/2016	WELL #2	Y	0.000		0.000
CADMIUM	05/06/2019	WELL #1	Y	0.000		0.000
CADMIUM	05/06/2019	WELL #2	Y	0.000		0.000

CADMIUM	06/09/2016	WELL #1	Y	0.000		0.000
CARBOFURAN	11/12/2019	WELL #2	Y	0.000		0.000
CARBOFURAN	06/09/2016	WELL #1	Y	0.000		0.000
CARBOFURAN	06/09/2016	WELL #2	Y	0.000		0.000
CARBON TETRACHLORIDE	06/09/2016	WELL #1	Y	0.000		0.000
CARBON TETRACHLORIDE	06/09/2016	WELL #2	Y	0.000		0.000
CHLORDANE	11/12/2019	WELL #2	Y	0.000		0.000
CHLORDANE	06/09/2016	WELL #1	Y	0.000		0.000
CHLORDANE	06/09/2016	WELL #2	Y	0.000		0.000
CHLOROBENZENE	06/09/2016	WELL #1	Y	0.000		0.000
CHLOROBENZENE	06/09/2016	WELL #2	Y	0.000		0.000
CHROMIUM	05/06/2019	WELL #1	Y	0.000		0.000
CHROMIUM	05/06/2019	WELL #2	Y	0.000		0.000
CHROMIUM	06/09/2016	WELL #1	Y	0.000		0.000
CIS-1,2-DICHLOROETHYLENE	06/09/2016	WELL #1	Y	0.000		0.000
CIS-1,2-DICHLOROETHYLENE	06/09/2016	WELL #2	Y	0.000		0.000
COMBINED RADIUM (-226 & -228)	08/19/2019	WELL #1		1.500	PCI/L	1.500
COMBINED RADIUM (-226 & -228)	06/09/2016	WELL #2	Y	0.000		0.000
COMBINED URANIUM	08/19/2019	WELL #1	N	3.700	UG/L	3.700
COMBINED URANIUM	06/09/2016	WELL #2	N	7.790	UG/L	7.790
DALAPON	11/12/2019	WELL #2	Y	0.000		0.000
DALAPON	06/09/2016	WELL #1	Y	0.000		0.000
DALAPON	06/09/2016	WELL #2	Y	0.000		0.000
DI(2-ETHYLHEXYL) ADIPATE	11/12/2019	WELL #2	Y	0.000		0.000
DI(2-ETHYLHEXYL) ADIPATE	06/09/2016	WELL #1	Y	0.000		0.000
DI(2-ETHYLHEXYL) ADIPATE	06/09/2016	WELL #2	Y	0.000		0.000
DI(2-ETHYLHEXYL) PHTHALATE	11/12/2019	WELL #2	Y	0.000		0.000
DI(2-ETHYLHEXYL) PHTHALATE	06/09/2016	WELL #1	Y	0.000		0.000
DI(2-ETHYLHEXYL) PHTHALATE	06/09/2016	WELL #2	Y	0.000		0.000
DICHLOROMETHANE	06/09/2016	WELL #1	Y	0.000		0.000
DICHLOROMETHANE	06/09/2016	WELL #2	Y	0.000		0.000
DINOSEB	11/12/2019	WELL #2	Y	0.000		0.000
DINOSEB	06/09/2016	WELL #1	Y	0.000		0.000
DINOSEB	06/09/2016	WELL #2	Y	0.000		0.000
DIQUAT	11/12/2019	WELL #2	Y	0.000		0.000
DIQUAT	06/09/2016	WELL #1	Y	0.000		0.000
DIQUAT	06/09/2016	WELL #2	Y	0.000		0.000
ENDOTHALL	11/12/2019	WELL #2	Y	0.000		0.000
ENDOTHALL	06/09/2016	WELL #1	Y	0.000		0.000
ENDOTHALL	06/09/2016	WELL #2	Y	0.000		0.000
ENDRIN	11/12/2019	WELL #2	Y	0.000		0.000
ENDRIN	06/09/2016	WELL #1	Y	0.000		0.000
ENDRIN	06/09/2016	WELL #2	Y	0.000		0.000
ETHYLBENZENE	06/09/2016	WELL #1	Y	0.000		0.000
ETHYLBENZENE	06/09/2016	WELL #2	Y	0.000		0.000
ETHYLENE DIBROMIDE	11/12/2019	WELL #2	Y	0.000		0.000
ETHYLENE DIBROMIDE	06/09/2016	WELL #1	Y	0.000		0.000
ETHYLENE DIBROMIDE	06/09/2016	WELL #2	Y	0.000		0.000
FLUORIDE	05/06/2019	WELL #1	N	0.380	MG/L	0.380
FLUORIDE	05/06/2019	WELL #2	N	0.350	MG/L	0.350
GLYPHOSATE	11/12/2019	WELL #2	Y	0.000		0.000
GLYPHOSATE	06/09/2016	WELL #1	Y	0.000		0.000
GLYPHOSATE	06/09/2016	WELL #2	Y	0.000		0.000
GROSS ALPHA, EXCL. RADON & U	08/19/2019	WELL #1		1.600	PCI/L	1.600
GROSS ALPHA, EXCL. RADON & U	06/09/2016	WELL #2		3.020	PCI/L	3.020
GROSS ALPHA, INCL. RADON & U	08/19/2019	WELL #1	N	4.100	PCI/L	4.100
GROSS ALPHA, INCL. RADON & U	06/09/2016	WELL #1	N	11.400	PCI/L	11.400
GROSS ALPHA, INCL. RADON & U	06/09/2016	WELL #2	N	8.240	PCI/L	8.240
HEPTACHLOR	11/12/2019	WELL #2	Y	0.000		0.000
HEPTACHLOR	06/09/2016	WELL #1	Y	0.000		0.000
HEPTACHLOR	06/09/2016	WELL #2	Y	0.000		0.000
HEPTACHLOR EPOXIDE	11/12/2019	WELL #2	Y	0.000		0.000
HEPTACHLOR EPOXIDE	06/09/2016	WELL #1	Y	0.000		0.000
HEPTACHLOR EPOXIDE	06/09/2016	WELL #2	Y	0.000		0.000
HEXACHLOROBENZENE	11/12/2019	WELL #2	Y	0.000		0.000
HEXACHLOROBENZENE	06/09/2016	WELL #1	Y	0.000		0.000
HEXACHLOROBENZENE	06/09/2016	WELL #2	Y	0.000		0.000
HEXACHLOROCYCLOPENTADIENE	11/12/2019	WELL #2	Y	0.000		0.000
HEXACHLOROCYCLOPENTADIENE	06/09/2016	WELL #1	Y	0.000		0.000
HEXACHLOROCYCLOPENTADIENE	06/09/2016	WELL #2	Y	0.000		0.000
LASSO	11/12/2019	WELL #2	Y	0.000		0.000
LASSO	06/09/2016	WELL #1	Y	0.000		0.000
LASSO	06/09/2016	WELL #2	Y	0.000		0.000
MERCURY	05/06/2019	WELL #1	Y	0.000		0.000
MERCURY	05/06/2019	WELL #2	Y	0.000		0.000
MERCURY	06/09/2016	WELL #1	Y	0.000		0.000

METHOXYCHLOR	11/12/2019	WELL #2	Y	0.000		0.000
METHOXYCHLOR	06/09/2016	WELL #1	Y	0.000		0.000
METHOXYCHLOR	06/09/2016	WELL #2	Y	0.000		0.000
NICKEL	05/06/2019	WELL #1	Y	0.000		0.000
NICKEL	05/06/2019	WELL #2	Y	0.000		0.000
NICKEL	06/09/2016	WELL #1	Y	0.000		0.000
NITRATE	12/14/2020	WELL #1	N	0.940	MG/L	0.940
NITRATE	12/14/2020	WELL #2	N	0.780	MG/L	0.780
NITRATE	05/06/2019	WELL #1	N	1.000	MG/L	1.000
NITRATE	05/06/2019	WELL #2	N	0.800	MG/L	0.800
NITRATE	11/19/2018	WELL #2	N	0.790	MG/L	0.790
NITRATE	05/11/2018	WELL #1	N	1.240	MG/L	1.240
NITRATE	11/16/2017	WELL #1	N	1.650	MG/L	1.650
NITRATE	11/16/2017	WELL #2	N	0.750	MG/L	0.750
NITRATE	06/09/2016	WELL #1	N	1.650	MG/L	1.650
NITRATE	06/09/2016	WELL #2	N	0.850	MG/L	0.850
O-DICHLOROBENZENE	06/09/2016	WELL #1	Y	0.000		0.000
O-DICHLOROBENZENE	06/09/2016	WELL #2	Y	0.000		0.000
OXAMYL	11/12/2019	WELL #2	Y	0.000		0.000
OXAMYL	06/09/2016	WELL #1	Y	0.000		0.000
OXAMYL	06/09/2016	WELL #2	Y	0.000		0.000
P-DICHLOROBENZENE	06/09/2016	WELL #1	Y	0.000		0.000
P-DICHLOROBENZENE	06/09/2016	WELL #2	Y	0.000		0.000
PENTACHLOROPHENOL	11/12/2019	WELL #2	Y	0.000		0.000
PENTACHLOROPHENOL	06/09/2016	WELL #1	Y	0.000		0.000
PENTACHLOROPHENOL	06/09/2016	WELL #2	Y	0.000		0.000
PICLORAM	11/12/2019	WELL #2	Y	0.000		0.000
PICLORAM	06/09/2016	WELL #1	Y	0.000		0.000
PICLORAM	06/09/2016	WELL #2	Y	0.000		0.000
RADIUM-226	08/19/2019	WELL #1	N	0.400	PCI/L	0.400
RADIUM-226	06/09/2016	WELL #2	Y	0.000		0.000
RADIUM-228	08/19/2019	WELL #1	N	1.100	PCI/L	1.100
RADIUM-228	06/09/2016	WELL #2	Y	0.000		0.000
SELENIUM	05/06/2019	WELL #1	Y	0.000		0.000
SELENIUM	05/06/2019	WELL #2	Y	0.000		0.000
SELENIUM	06/09/2016	WELL #1	Y	0.000		0.000
SIMAZINE	11/12/2019	WELL #2	Y	0.000		0.000
SIMAZINE	06/09/2016	WELL #1	Y	0.000		0.000
SIMAZINE	06/09/2016	WELL #2	Y	0.000		0.000
STYRENE	06/09/2016	WELL #1	Y	0.000		0.000
STYRENE	06/09/2016	WELL #2	Y	0.000		0.000
TETRACHLOROETHYLENE	06/09/2016	WELL #1	Y	0.000		0.000
TETRACHLOROETHYLENE	06/09/2016	WELL #2	Y	0.000		0.000
THALLIUM, TOTAL	05/06/2019	WELL #1	Y	0.000		0.000
THALLIUM, TOTAL	05/06/2019	WELL #2	Y	0.000		0.000
THALLIUM, TOTAL	06/09/2016	WELL #1	Y	0.000		0.000
TOLUENE	06/09/2016	WELL #1	Y	0.000		0.000
TOLUENE	06/09/2016	WELL #2	Y	0.000		0.000
TOTAL POLYCHLORINATED BIPHENYLS (PCB)	11/12/2019	WELL #2	Y	0.000		0.000
TOTAL POLYCHLORINATED BIPHENYLS (PCB)	06/09/2016	WELL #1	Y	0.000		0.000
TOTAL POLYCHLORINATED BIPHENYLS (PCB)	06/09/2016	WELL #2	Y	0.000		0.000
TOXAPHENE	11/12/2019	WELL #2	Y	0.000		0.000
TOXAPHENE	06/09/2016	WELL #1	Y	0.000		0.000
TOXAPHENE	06/09/2016	WELL #2	Y	0.000		0.000
TRANS-1,2-DICHLOROETHYLENE	06/09/2016	WELL #1	Y	0.000		0.000
TRANS-1,2-DICHLOROETHYLENE	06/09/2016	WELL #2	Y	0.000		0.000
TRICHLOROETHYLENE	06/09/2016	WELL #1	Y	0.000		0.000
TRICHLOROETHYLENE	06/09/2016	WELL #2	Y	0.000		0.000
VINYL CHLORIDE	06/09/2016	WELL #1	Y	0.000		0.000
VINYL CHLORIDE	06/09/2016	WELL #2	Y	0.000		0.000
XYLENES, TOTAL	06/09/2016	WELL #1	Y	0.000		0.000
XYLENES, TOTAL	06/09/2016	WELL #2	Y	0.000		0.000

Note: Please notify your regional DEQ office if you find discrepancies in your sampling or violation histories. DEQ will correct the errors in the agency's database.

Coliform Sampling History

PWS Number: ID5160001
PWS Name: ALBION CITY OF
Total Records: 12

Only report coliform results in the CCR if one or more samples tested positive during the 2020 calendar year.

Required Language. If your water system's coliform history for the year included one or more samples present for coliform, you must give the major sources of the contaminant. To report this information, go to **Appendix A of the CCR template**, find the contaminant, and copy the information from the *"Major Sources in Drinking Water"* column and place it in your CCR. If the system has exceeded the MCL (maximum contaminant level) value for coliforms, go to **Appendix A of the CCR template**, find the contaminant, and copy the information from the *"Health Effects Language"* column and place it in your CCR.

Coliform Sampling History
Total Records: 12

Contaminant	Date Collected	P=Present A=Absent
COLIFORM (TCR)	12/01/2020	A
COLIFORM (TCR)	11/02/2020	A
COLIFORM (TCR)	10/05/2020	A
COLIFORM (TCR)	09/01/2020	A
COLIFORM (TCR)	08/04/2020	A
COLIFORM (TCR)	07/13/2020	A
COLIFORM (TCR)	06/01/2020	A
COLIFORM (TCR)	05/04/2020	A
COLIFORM (TCR)	04/06/2020	A
COLIFORM (TCR)	03/09/2020	A
COLIFORM (TCR)	02/10/2020	A
COLIFORM (TCR)	01/06/2020	A

Note: Please notify your regional DEQ office if you find discrepancies in your sampling or violation histories. DEQ will correct the errors in the agency's database.

Lead And Copper Sampling History

PWS Number: ID5160001
PWS Name: ALBION CITY OF
Total Records: 4

A public water system is only required to report the most recent 90% percentile detections for lead and copper within the past five years. If a result is listed as zero, it should be assumed the result was actually a non-detect.

Other lead and copper information to be included in the CCR not listed on this page are the number of samples collected from the distribution system, and the highest level of lead or copper that was detected.

Required Language. If there are detections for lead and copper to report, the system must give the major sources of the contaminant. If a system reports a detection, the system must give the major sources of the contaminant. To report this information, go to **Appendix A of the CCR template**, find the contaminant, and copy the information from the *"Major Sources in Drinking Water"* column and place it in your CCR. If the system exceeds the MCL (maximum contaminant level) value of a contaminant, the system must show the potential health effects of the contaminant. To report this information, go to **Appendix A of the CCR template**, find the contaminant, and copy the information from the *"Health Effects Language"* column and place it in your CCR.

Abbreviations used below:
MG/L (mg/L) = milligrams per liter (mg/L = ppm in Appendix A)
UG/L (µg/L) = micrograms per liter (µg/L = ppb in Appendix A)

Contaminant	# Samples Collected	90th %ile Result	Units	Date Collected	CCR Units
LEAD SUMMARY	5	0.002	MG/L	09/27/2019	2.000
COPPER SUMMARY	5	0.175	MG/L	09/27/2019	0.175
LEAD SUMMARY	5	0.000	MG/L	06/09/2016	0.000
COPPER SUMMARY	5	0.190	MG/L	06/09/2016	0.190

Note: Please notify your regional DEQ office if you find discrepancies in your sampling or violation histories. DEQ will correct the errors in the agency's database.

DBP Sampling History

PWS Number: ID5160001
PWS Name: ALBION CITY OF
Total Records: 42

Sampling history is only listed for systems which are practicing chlorination on a full-time basis.

Public water systems that are required to collect one sample for disinfection byproducts once every year, or every three years, are only required to report the most recent detections for disinfection byproducts. If the most recent sampling was a non-detect for the contaminants, then it is not necessary to report any disinfection byproduct sampling. **Note:** If a contaminant is listed with a "Y" (meaning "Yes") in the "non-detect" column, this means that sampling results showed a "non-detect" - that is to say, the contaminant was not detected.

If a public water system collects more than one sample per year, the system must report the average of Total Trihalomethanes and Haloacetic Acids Group 5 over the 2020 calendar year. The highest level detected, and the range for each contaminant must also be reported.

Required Language. If a system reports a detection, the system must give the major sources of the contaminant. To report this information, go to **Appendix A of the CCR template**, find the contaminant, and copy the information from the *"Major Sources in Drinking Water"* column and place it in your CCR. If the system has exceeded the MCL (maximum contaminant level) value of a contaminant, go to **Appendix A of the CCR template**, find the contaminant, and copy the information from the *"Health Effects Language"* column and place it in your CCR.

Contaminant	Date Collected	Sampling Location	Non Detect?	Detected Level	Units	CCR Units
TOTAL HALOACETIC ACIDS (HAA5)	09/19/2016	550 SOUTH MAIN	Y	0.000		0.000
TOTAL HALOACETIC ACIDS (HAA5)	07/18/2013	GENERIC SAMPLING POI	N	0.008	MG/L	7.700
TOTAL HALOACETIC ACIDS (HAA5)	07/24/2012	GENERIC SAMPLING POI	Y	0.000		0.000
TOTAL HALOACETIC ACIDS (HAA5)	07/27/2011	GENERIC SAMPLING POI	N	0.002	MG/L	1.600
TOTAL HALOACETIC ACIDS (HAA5)	07/27/2011	GENERIC SAMPLING POI	Y	0.000		0.000
TOTAL HALOACETIC ACIDS (HAA5)	07/29/2010	GENERIC SAMPLING POI	Y	0.000		0.000
TOTAL HALOACETIC ACIDS (HAA5)	07/29/2010	GENERIC SAMPLING POI	Y	0.000		0.000
TOTAL HALOACETIC ACIDS (HAA5)	08/17/2009	GENERIC SAMPLING POI	Y	0.000		0.000
TOTAL HALOACETIC ACIDS (HAA5)	08/17/2009	GENERIC SAMPLING POI	Y	0.000		0.000
TOTAL HALOACETIC ACIDS (HAA5)	08/13/2008	GENERIC SAMPLING POI	N	0.005	MG/L	5.120
TOTAL HALOACETIC ACIDS (HAA5)	08/13/2008	GENERIC SAMPLING POI	N	0.007	MG/L	7.310
TOTAL HALOACETIC ACIDS (HAA5)	08/31/2007	GENERIC SAMPLING POI	Y	0.000	MG/L	0.000
TOTAL HALOACETIC ACIDS (HAA5)	08/31/2007	GENERIC SAMPLING POI	Y	0.000	MG/L	0.000
TOTAL HALOACETIC ACIDS (HAA5)	12/19/2006	GENERIC SAMPLING POI	N	0.003	MG/L	2.900
TOTAL HALOACETIC ACIDS (HAA5)	12/19/2006	GENERIC SAMPLING POI	N	0.004	MG/L	3.900
TOTAL HALOACETIC ACIDS (HAA5)	08/25/2005	GENERIC SAMPLING POI	Y	0.000	MG/L	0.000
TOTAL HALOACETIC ACIDS (HAA5)	08/25/2005	GENERIC SAMPLING POI	N	0.001	MG/L	1.300
TOTAL HALOACETIC ACIDS (HAA5)	08/25/2005	GENERIC SAMPLING POI	Y	0.000	MG/L	0.000
TOTAL HALOACETIC ACIDS (HAA5)	10/25/2004	GENERIC SAMPLING POI	N	0.003	MG/L	3.000
TOTAL HALOACETIC ACIDS (HAA5)	10/25/2004	GENERIC SAMPLING POI	N	0.003	MG/L	3.000
TOTAL HALOACETIC ACIDS (HAA5)	10/25/2004	GENERIC SAMPLING POI	N	0.003	MG/L	3.000
TTHM	09/19/2016	550 SOUTH MAIN	Y	0.000		0.000
TTHM	07/18/2013	GENERIC SAMPLING POI	Y	0.000		0.000
TTHM	07/24/2012	GENERIC SAMPLING POI	N	0.001	MG/L	0.510
TTHM	07/27/2011	GENERIC SAMPLING POI	N	0.001	MG/L	0.510
TTHM	07/27/2011	GENERIC SAMPLING POI	N	0.001	MG/L	1.210
TTHM	07/29/2010	GENERIC SAMPLING POI	Y	0.000		0.000
TTHM	07/29/2010	GENERIC SAMPLING POI	Y	0.000		0.000
TTHM	08/17/2009	GENERIC SAMPLING POI	Y	0.000		0.000
TTHM	08/17/2009	GENERIC SAMPLING POI	Y	0.000		0.000
TTHM	08/13/2008	GENERIC SAMPLING POI	N	0.005	MG/L	4.690
TTHM	08/13/2008	GENERIC SAMPLING POI	N	0.010	MG/L	9.920
TTHM	08/31/2007	GENERIC SAMPLING POI	Y	0.000	MG/L	0.000
TTHM	08/31/2007	GENERIC SAMPLING POI	Y	0.000	MG/L	0.000
TTHM	12/19/2006	GENERIC SAMPLING POI	N	0.012	MG/L	12.000
TTHM	12/19/2006	GENERIC SAMPLING POI	N	0.004	MG/L	3.700
TTHM	08/25/2005	GENERIC SAMPLING POI	N	0.003	MG/L	3.200
TTHM	08/25/2005	GENERIC SAMPLING POI	Y	0.000	MG/L	0.000

TTHM	08/25/2005	GENERIC SAMPLING POI	Y	0.000	MG/L	0.000
TTHM	10/25/2004	GENERIC SAMPLING POI	N	0.007	MG/L	6.600
TTHM	10/25/2004	GENERIC SAMPLING POI	N	0.007	MG/L	6.500
TTHM	10/25/2004	GENERIC SAMPLING POI	N	0.006	MG/L	5.700

Note: Please notify your regional DEQ office if you find discrepancies in your sampling or violation histories. DEQ will correct the errors in the agency's database.

RTCR Sampling History

PWS Number: ID5160001
PWS Name: ALBION CITY OF
Total Records: 0

Only report if your water system was required to comply with one or more Revised Total Coliform Rule (RTCR) Level 1 and/or Level 2 Assessments during the 2017 calendar year.

Required Language: If your water system was required to conduct an RTCR Level 1 or Level 2 Assessment (numbers I-III below), the associated information must be reported in the CCR in accordance with IDAPA 58.01.08.151.

I. If your water system was required to conduct a Level 1 or 2 assessment **not** due to an *E. coli* MCL violation, go to section I below.
II. If your water system was required to conduct a Level 2 assessment **due** to an *E. coli* MCL violation, go to section II below.
III. If your water system detected *E. coli* and **did not** violate the *E. coli* MCL, go to section III below.

I. If your water system was required to conduct a Level 1 or 2 assessment not due to an *E.coli* MCL violation, you must include in the report adverse health affect information and additional information regarding the number of assessments required, the number of assessments completed, the number of corrective actions required and the number of corrective actions completed.

(A) Adverse Health Effects Required Text: Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. We found coliforms indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessment(s) to identify problems and to correct any problems that were found during these assessments.

(B) Additional Information Required:

a. During the past year we were required to conduct [INSERT NUMBER OF LEVEL 1 ASSESSMENTS] Level 1 assessment(s). [INSERT NUMBER OF LEVEL 1 ASSESSMENTS] Level 1 assessment(s) were completed. In addition, we were required to take [INSERT NUMBER OF CORRECTIVE ACTIONS] corrective actions and we completed [INSERT NUMBER OF CORRECTIVE ACTIONS] of these actions.

b. During the past year [INSERT NUMBER OF LEVEL 2 ASSESSMENTS] Level 2 assessments were required to be completed for our water system. [INSERT NUMBER OF LEVEL 2 ASSESSMENTS] Level 2 assessments were completed. In addition, we were required to take [INSERT NUMBER OF CORRECTIVE ACTIONS] corrective actions and we completed [INSERT NUMBER OF CORRECTIVE ACTIONS] of these actions.

c. Any system that has failed to complete all the required assessments or correct all identified sanitary defects, is in violation of the treatment technique requirement and must also include one or both of the following statements, as appropriate:

i. During the past year we failed to conduct all of the required assessment(s).

ii. During the past year we failed to correct all identified defects that were found during the assessment.

II. If your water system was required to conduct a Level 2 assessment due to an *E.coli* MCL violation, you must include in the report adverse health affect information and additional information regarding the number of assessments required, the number of assessments completed, the number of corrective actions required and the number of corrective actions completed.

(A) Adverse Health Effects Required Text: *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems. We found *E. coli* bacteria, indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessment(s) to identify problems and to correct any problems that were found during these assessments.

(B) Additional Information Required:

a. We were required to complete a Level 2 assessment because we found *E. coli* in our water system. In addition, we were required to take [INSERT NUMBER OF CORRECTIVE ACTIONS] corrective actions and we completed [INSERT NUMBER OF CORRECTIVE ACTIONS] of these actions.

b. Any system that has failed to complete the required assessment or correct all identified sanitary defects, is in violation of the treatment technique requirement and must also include one or both of the following statements, as appropriate:

i. We failed to conduct the required assessment.

ii. We failed to correct all sanitary defects that were identified during the assessment that we conducted.

c. Any system that violated the *E. coli* MCL, the system must include, in addition to the required adverse health effects text [see II.(A) above], one or more of the following statements to describe any noncompliance, as applicable:

i. We had an *E. coli*-positive repeat sample following a total coliform-positive routine sample.

ii. We had a total coliform-positive repeat sample following an *E. coli*-positive routine sample.

iii. We failed to take all required repeat samples following an *E. coli*-positive routine sample.

iv. We failed to test for *E. coli* when any repeat sample tests positive for total coliform.

III. If your water system detected *E. coli* and did not violate the *E. coli* MCL, the system may include, in addition to the required adverse health effects text [See II.(A) above], a statement that explains that although *E. coli* water detected, your system was not in violation of the *E. coli* MCL.

No results were found for the RTCR Sampling History Report.

Note: Please notify your regional DEQ office if you find discrepancies in your sampling or violation histories. DEQ will correct the errors in the agency's database.

Chlorine Maximum Residual Disinfectant Level Sampling History

PWS Number: ID5160001
PWS Name: ALBION CITY OF
Total Records: 12

Sampling history is only listed for systems which are practicing chlorination on a full-time basis.

Please include in your CCR the highest chlorine residual level detected during the previous calendar year (2020) by your system, as well as the average of all residuals collected during 2020.

Required Language. If the system exceeds the chlorine MCL (maximum contaminant level) value, the system must show the potential health effects of the contaminant. To report this information, go to **Appendix A of the CCR template**, find the contaminant, and copy the information from the *"Health Effects Language"* column and place it in your CCR.

Samples Collected	Chlorine Residual	Units	Begin Date	Monitoring Period
1	0.0700	MG/L	01/01/2020	JAN2020
1	0.1800	MG/L	02/01/2020	FEB2020
1	0.1500	MG/L	03/01/2020	MAR2020
1	0.2400	MG/L	04/01/2020	APR2020
1	0.3100	MG/L	05/01/2020	MAY2020
1	0.3900	MG/L	06/01/2020	JUN2020
1	0.3600	MG/L	07/01/2020	JUL2020
1	0.4800	MG/L	08/01/2020	AUG2020
1	0.4200	MG/L	09/01/2020	SEP2020
1	0.3300	MG/L	10/01/2020	OCT2020
1	0.4300	MG/L	11/01/2020	NOV2020
1	0.4600	MG/L	12/01/2020	DEC2020

Note: Please notify your regional DEQ office if you find discrepancies in your sampling or violation histories. DEQ will correct the errors in the agency's database.

Drinking Water Branch

Violations

Return Links

Water System Detail

Water Systems

Water System Search

County Map

Glossary

Water System No. :	ID5160001	**Federal Type :**	C
Water System Name :	ALBION CITY OF	**State Type :**	C
Principal County Served :	CASSIA	**Primary Source :**	GW
Status :	A	**Activity Date :**	04-05-1991

****Please note**: some of these violations may have been resolved and/or returned to compliance. Please click on the violation to view more information on its compliance status.**

Group Violations

Violation No.	Status	Violation Type	Violation Name	Analyte Group Code	Analyte Group Name	Water System Facility State Asgn ID	Water System Facility Name
2020-11183	V	27	MONITORING, ROUTINE (DBP), MAJOR	DBP2	DBP2 - STAGE 2	T5160001DS1	DISTRIBUTION SYSTEM
2011-7929	V	03	MONITORING, ROUTINE MAJOR	ALFA	RADS - GROSS ALPHA	E0007568	WELL #3
2011-7450	V	03	MONITORING, ROUTINE MAJOR	ZNO3	NITRATE	E0007568	WELL #3
2011-7568	V	03	MONITORING, ROUTINE MAJOR	ZIOC	IOCS - PHASE 2 AND 5	E0007568	WELL #3
2011-7589	V	03	MONITORING, ROUTINE MAJOR	ZARS	ARSENIC (1005)	E0007568	WELL #3
2011-7725	V	03	MONITORING, ROUTINE MAJOR	SODI	IOC - SODIUM	E0007568	WELL #3
2010-6868	V	03	MONITORING, ROUTINE MAJOR	ZNO3	NITRATE	E0007568	WELL #3
2007-4599	V	27	MONITORING, ROUTINE (DBP), MAJOR	ZDBP	ZDBP - CLOSED 1/1/15	T5160001DS1	DISTRIBUTION SYSTEM

Total Number of Records Fetched = 8

Individual Violations

Violation No.	Status	Violation Type	Violation Name	Analyte Code	Analyte Name	Water System Facility State Asgn ID	Water System Facility Name
2019-8242	V	27	MONITORING, ROUTINE (DBP), MAJOR	0999	CHLORINE	T5160001DS1	DISTRIBUTION SYSTEM
2019-8243	V	27	MONITORING, ROUTINE (DBP), MAJOR	0999	CHLORINE	T5160001DS1	DISTRIBUTION SYSTEM
2019-	V	27	MONITORING,	0999	CHLORINE	T5160001DS1	DISTRIBUTION

8239			ROUTINE (DBP), MAJOR				SYSTEM
2019-8240	V	27	MONITORING, ROUTINE (DBP), MAJOR	0999	CHLORINE	T5160001DS1	DISTRIBUTION SYSTEM
2019-8241	V	27	MONITORING, ROUTINE (DBP), MAJOR	0999	CHLORINE	T5160001DS1	DISTRIBUTION SYSTEM
2019-8237	V	27	MONITORING, ROUTINE (DBP), MAJOR	0999	CHLORINE	T5160001DS1	DISTRIBUTION SYSTEM
2019-8238	V	27	MONITORING, ROUTINE (DBP), MAJOR	0999	CHLORINE	T5160001DS1	DISTRIBUTION SYSTEM
2018-8234	V	27	MONITORING, ROUTINE (DBP), MAJOR	0999	CHLORINE	T5160001DS1	DISTRIBUTION SYSTEM
2018-8235	V	27	MONITORING, ROUTINE (DBP), MAJOR	0999	CHLORINE	T5160001DS1	DISTRIBUTION SYSTEM
2018-8236	V	27	MONITORING, ROUTINE (DBP), MAJOR	0999	CHLORINE	T5160001DS1	DISTRIBUTION SYSTEM
2015-8231	V	22	MCL (TCR), MONTHLY	3100	COLIFORM (TCR)	null	null
2014-8229	V	27	MONITORING, ROUTINE (DBP), MAJOR	0999	CHLORINE	T5160001DS1	DISTRIBUTION SYSTEM
2013-8228	V	27	MONITORING, ROUTINE (DBP), MAJOR	0999	CHLORINE	T5160001DS1	DISTRIBUTION SYSTEM
2012-8226	V	27	MONITORING, ROUTINE (DBP), MAJOR	0999	CHLORINE	T5160001DS1	DISTRIBUTION SYSTEM
2011-8224	V	27	MONITORING, ROUTINE (DBP), MAJOR	0999	CHLORINE	T5160001DS1	DISTRIBUTION SYSTEM
2011-8222	V	03	MONITORING, ROUTINE MAJOR	2931	1,2-DIBROMO-3-CHLOROPROPANE	E0007568	WELL #3
2011-8221	V	03	MONITORING, ROUTINE MAJOR	2946	ETHYLENE DIBROMIDE	E0007568	WELL #3
2011-8209	V	23	MONITORING (TCR), ROUTINE MAJOR	3100	COLIFORM (TCR)	null	null
2005-7905	V	27	MONITORING, ROUTINE (DBP), MAJOR	0999	CHLORINE	T5160001DS1	DISTRIBUTION SYSTEM
2003-7803	V	22	MCL (TCR), MONTHLY	3100	COLIFORM (TCR)	null	null
2003-7603	V	26	MONITORING (TCR), REPEAT MINOR	3100	COLIFORM (TCR)	null	null
2003-7703	V	22	MCL (TCR), MONTHLY	3100	COLIFORM (TCR)	null	null
1999-1999	V	24	MONITORING (TCR),	3100	COLIFORM (TCR)	null	null

			ROUTINE MINOR				
1999-2099	V	26	MONITORING (TCR), REPEAT MINOR	3100	COLIFORM (TCR)	null	null
1999-2199	V	23	MONITORING (TCR), ROUTINE MAJOR	3100	COLIFORM (TCR)	null	null
1999-2299	V	23	MONITORING (TCR), ROUTINE MAJOR	3100	COLIFORM (TCR)	null	null
1999-2399	V	24	MONITORING (TCR), ROUTINE MINOR	3100	COLIFORM (TCR)	null	null
1998-798	V	22	MCL (TCR), MONTHLY	3100	COLIFORM (TCR)	null	null
1998-1398	V	23	MONITORING (TCR), ROUTINE MAJOR	3100	COLIFORM (TCR)	null	null
1998-1498	V	03	MONITORING, ROUTINE MAJOR	1040	NITRATE	E0007566	WELL #1
1997-2697	V	24	MONITORING (TCR), ROUTINE MINOR	3100	COLIFORM (TCR)	null	null
1997-2897	V	03	MONITORING, ROUTINE MAJOR	1040	NITRATE	E0007567	WELL #2
1997-2797	V	23	MONITORING (TCR), ROUTINE MAJOR	3100	COLIFORM (TCR)	null	null
1996-3896	V	24	MONITORING (TCR), ROUTINE MINOR	3100	COLIFORM (TCR)	null	null
1996-3996	V	25	MONITORING (TCR), REPEAT MAJOR	3100	COLIFORM (TCR)	null	null
1996-4096	V	22	MCL (TCR), MONTHLY	3100	COLIFORM (TCR)	null	null
1996-4196	V	22	MCL (TCR), MONTHLY	3100	COLIFORM (TCR)	null	null
1996-4296	V	22	MCL (TCR), MONTHLY	3100	COLIFORM (TCR)	null	null
1996-4396	V	03	MONITORING, ROUTINE MAJOR	1074	ANTIMONY, TOTAL	E0007567	WELL #2
1996-4496	V	03	MONITORING, ROUTINE MAJOR	1075	BERYLLIUM, TOTAL	E0007567	WELL #2
1996-4596	V	03	MONITORING, ROUTINE	1085	THALLIUM, TOTAL	E0007567	WELL #2

			MAJOR				
1996-4696	V	03	MONITORING, ROUTINE MAJOR	1036	NICKEL	E0007567	WELL #2
1995-2995	V	23	MONITORING (TCR), ROUTINE MAJOR	3100	COLIFORM (TCR)	null	null
1995-3095	V	24	MONITORING (TCR), ROUTINE MINOR	3100	COLIFORM (TCR)	null	null
1993-3393	V	23	MONITORING (TCR), ROUTINE MAJOR	3100	COLIFORM (TCR)	null	null
1993-3493	V	23	MONITORING (TCR), ROUTINE MAJOR	3100	COLIFORM (TCR)	null	null
1993-3593	V	23	MONITORING (TCR), ROUTINE MAJOR	3100	COLIFORM (TCR)	null	null
1991-191	V	21	MCL (TCR), ACUTE	3100	COLIFORM (TCR)	null	null
1991-1191	V	21	MCL (TCR), ACUTE	3100	COLIFORM (TCR)	null	null
1991-1291	V	22	MCL (TCR), MONTHLY	3100	COLIFORM (TCR)	null	null
1991-2591	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1990-890	V	01	MCL, SINGLE SAMPLE	3000	COLIFORM (PRE-TCR)	null	null
1990-1690	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1990-1590	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1990-690	V	01	MCL, SINGLE SAMPLE	3000	COLIFORM (PRE-TCR)	null	null
1990-490	V	01	MCL, SINGLE SAMPLE	3000	COLIFORM (PRE-TCR)	null	null
1990-390	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1990-5190	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1990-4990	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1989-1089	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1989-5289	V	02	MCL, AVERAGE	3000	COLIFORM (PRE-TCR)	null	null

1988-5788	V	02	MCL, AVERAGE	3000	COLIFORM (PRE-TCR)	null	null
1986-5886	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1986-5586	V	02	MCL, AVERAGE	3000	COLIFORM (PRE-TCR)	null	null
1986-5486	V	02	MCL, AVERAGE	3000	COLIFORM (PRE-TCR)	null	null
1986-5086	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1985-5385	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1984-6884	V	02	MCL, AVERAGE	3000	COLIFORM (PRE-TCR)	null	null
1984-6784	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1984-6684	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1983-6483	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1983-6383	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1983-6083	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1983-5983	V	02	MCL, AVERAGE	3000	COLIFORM (PRE-TCR)	null	null
1983-5683	V	02	MCL, AVERAGE	3000	COLIFORM (PRE-TCR)	null	null
1983-283	V	02	MCL, AVERAGE	3000	COLIFORM (PRE-TCR)	null	null
1982-6582	V	02	MCL, AVERAGE	3000	COLIFORM (PRE-TCR)	null	null
1982-6282	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1982-6182	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1982-1882	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1982-982	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1981-3681	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1981-3781	V	02	MCL, AVERAGE	3000	COLIFORM (PRE-TCR)	null	null
1981-1781	V	02	MCL, AVERAGE	3000	COLIFORM (PRE-TCR)	null	null

1981-3281	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1981-2481	V	02	MCL, AVERAGE	3000	COLIFORM (PRE-TCR)	null	null
1980-4880	V	02	MCL, AVERAGE	3000	COLIFORM (PRE-TCR)	null	null
1980-3180	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null
1980-4780	V	02	MCL, AVERAGE	3000	COLIFORM (PRE-TCR)	null	null
1980-580	V	03	MONITORING, ROUTINE MAJOR	3000	COLIFORM (PRE-TCR)	null	null

Total Number of Records Fetched = 90

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

650 Addison Avenue West, Suite 110 • Twin Falls, Idaho 83301 • (208) 736-2190
www.deq.idaho.gov

September 28, 2016

Shawn T. Burton
City of Albion
200 E North Street
Albion, ID 83311

Subject: Enhanced Sanitary Survey conducted on September 22, 2016, PWS# ID5160001

Dear Mr. Burton:

We recently conducted an Enhanced Sanitary Survey (ESS) for your public water system (PWS) ID5160001. I am enclosing a copy of the ESS form, the photo log, and photos for your records. I have also attached a list of deficiencies and/or recommended improvements for your system. I am also enclosing a copy of PWS Current Water Rates and Charges.

Please keep in mind that a preliminary engineering report for all new water systems or modifications to existing water systems must be submitted to and approved by DEQ prior to the submittal of plans and specifications, as required by IDAPA 58.01.08.503.01.

Following approval of the preliminary engineering report, plans and specifications must be submitted to and approved by DEQ prior to construction of new public water systems or modifications of existing public water systems, as required by IDAPA 58.01.08.504.

Thank you for your time and cooperation in the completion of this survey. If you have any questions, please contact me at the DEQ Twin Falls Regional Office at (208) 736-2190.

Sincerely,

Stephen P. Lampert
Regional Drinking Water Program Coordinator

SPL:jj

Enclosures (4)

September 27, 2016
City of Albion
PWS#5160001

RE: Enhanced Sanitary Survey Report conducted on September 22, 2016

You will find a list of the deficiencies and recommended improvements for your system summarized below. There were no significant deficiencies found during this inspection.

Deficiencies

Groundwater Source:
#26: (***Deficiency***) - The well casing for well 1 and Tag #E0007566 does not extend 18 inches above the final ground surface or 12 inches above the pump house floor, as required by IDAPA 58.01.08. 511.06.a. There is a low potential for the casing to be covered by water during a flooding event. However, the Casing must be raised to the required height next time material modifications occur to this section of the water system. The casing height requirement will also be reevaluated every time an ESS is conducted. **(No action required at this time)**

Pumping: #9: (***Deficiency***) - There is no auxiliary power on-site as required by IDAPA 58.01.08.501.07. According to the operator, the power outages experienced by the system are of minimal frequency and duration that auxiliary power will not be required. The need for auxiliary power on-site will be reevaluated every time an ESS is conducted. **(No action required at this time)**

Recommendations

Groundwater Source: There is no well log on file for Well # 1 and #2 - E0007566 and E0007567 respectively. The pump capacity, date drilled, well depth, casing depth, grout depth, and static water depth are recorded. However, the screen and/or perforation depth are all unknown for these wells. DEQ recommends the operators identify and record this information the next time maintenance is conducted on this well.

This system is in substantial compliance with the IDEQ regulations. Thank you for your time and cooperation in the completion of this survey. If you have any questions, please contact me at the IDEQ Twin Falls Regional Office at 208-736-2100

Sincerely,

Stephen P. Lampert
Regional Drinking Water Program Coordinator
Idaho Department of Environmental Quality

Enclosures:

Enhanced Sanitary Survey Inspection Form
Photo Log and Photos
PWS Current Water Rates and Charges

State of Idaho Public Water System Enhanced Sanitary Survey

WATER SYSTEM INVENTORY INFORMATION

SURVEY DATE: 9/22/2016 (mm/dd/yyyy)

PWS #: 5160001

Name of Public Water System: **City of Albion**

\# of Ground Water Sources: 3

\#of Surface Water Sources: 0

\# of Storage Facilities: 1

Total Storage (gal): 500,000

Date of Last Survey: 01/21/2009

Health District: ☑ N/A

DEQ Region: ☑ N/A — Twin Falls

County: Cassia

Number of Service Connections: 151

Residential Population: 310

Status: ☑ Approved ☐ Disapproved

Water Purchased From: ☑ N/A
PWS #:
Name:

Water Sold To: ☑ N/A
PWS #:
Name:

Owner Type: Local Government

Legal Entity: Government Agency

Water System Classification:
☑ Community Water System
☐ Nontransient Noncommunity
☐ Transient Noncommunity - NC

Combined Sources? ☐ Yes ☑ No
If yes, ☐ Well Field ☐ Manifold/Spring Box
Sources Combined:

System Classification:
Distribution: VSWS
Treatment: ☑ N/A

Seasonal Operation Dates: ☑ N/A
Date Open:
Date Closed:

Responsible Charge Operator (DO): ☐ No DO ☐ N/A - Identify Operator for GW-NC PWS)

☑ Mr. ☐ Ms. Shawn Burton

Properly Licensed? ☑ Yes ☐ No ☐ N/A-GW-NC

License Type: VSWS ☐ N/A

Mailing Address: 200 E North Street

License Number: DWDVSWS - 18873

Expiration Date: 2/17/2017

City, State, Zip Code: Albion, ID 83311

Telephone
Day: 219-3917
Night: 430-5351
Fax:

E-mail: shawn83311@yahoo.com

Legal Owner's Name:

☐ Mr. ☐ Ms. City of Albion

Mailing Address: PO Box 147

City, State, Zip Code: Albion, ID 83311

Telephone
Day: 673-5352
Night: 673-5351
Fax:

E-mail: albioncty@atnet.net

Substitute Responsible Charge Operator (OP): ☐ No OP ☐ N/A for GW-NC PWS

☑ Mr. ☐ Ms. Lomont Young

Properly Licensed? ☑ Yes ☐ No ☐ N/A-GW-NC

License Type: DWD1 ☐ N/A

Mailing Address: PO Box 159

License Number: DWD1 - 18520

Expiration Date: 11/17/2016

City, State, Zip Code: Delco, ID 83347

Telephone
Day: 654-2124
Night: 312-6662
Fax:

E-mail: rbohling@tfid.org

Individuals present during inspection:

Name	Title
Steve Lampert	Regional Drinkin
Shawn Burton	DO

Physical location of the PWS (Township, Range, Section):

Samples taken at the time of survey by inspector? ☐ Yes ☑ No

If yes, what:

Survey performed by:
Name: Steve Lampert
Title: Regional Drinking Water Coordinator
Phone #: 208-736-2190

Agency: ☑ IDEQ ☐ Health Dept. ☐ Other:

General Information

yes	no	n/a	unk	note	
☑	☐	☐	☐	☐	1. Have previously required Significant Deficiencies been addressed?
☑	☐	☐	☐	☐	2. Does the system owner have a written sample siting plan that is representative of water throughout the distribution system?
☑	☐	☐	☐	☐	3. Are TCR/RTCR monitoring samples being taken in accordance with the sample siting plan?
☐	☑	☐	☐	☐	4. Have material modifications been made to the PWS since the last ESS?
☐	☐	☑	☐	☐	5. If yes, were plans and specs submitted to and approved by DEQ?
☐	☑	☐	☐	☐	6. Are there any known issues or problems with equipment or operation of the PWS that could negatively effect the quality of the water produced? (*If yes, comment*)

Comments:

Sanitary Survey Index

Modules used:	#
☑ General Information	1
☑ Well Source	2
☐ Spring Source	
☑ Storage	1
☐ Hydropneumatic Tanks	
☑ Distribution	1
☑ Pumping	1
☑ Financial Capacity	1
☑ Managerial Capacity	1
☐ Treatment Application	
☑ Disinfection	1
☐ Gas Cl2	
☐ Notes	
☑ Photo Log	1
Total Modules	10

Page 1 Of 14

WELL SOURCE - PG.1

A separate sources form must be filled out for **each** well associated to the PWS.

SURVEY DATE: 9/22/2016 *(mm/dd/yyyy)* PWS #: 5160001

Tag #: E0007566	Common Name of Source: Well #1	Source associated with a: ☐ Wellfield ☐ Manifold	Is this Source Treated? ☑ Yes ☐ No
Physical Location: 100 South Main Street			Treatment Objective: ☐ N/A Disinfection
			Treatment Types: ☐ N/A *(Identify Treatment Train in Comments)* Sodium Hypochlorite

Is there a well log for the well source? ☐ Yes ☑ No ☐ N/A ☐ Unk

Pump Capacity (GPM)	Casing Size (In)	Date Drilled:	Well Depth (Ft)	Casing Depth (Ft)	Grout Depth(Ft)	Static Water Depth (Ft)
300 ☐ Unk	16 ☐ Unk	1/1/1968 ☐ Unk	900 ☐ Unk	☐ Unk	☑ Unk	55 ☐ Unk

Is the Casing Screened?	Screen Depth (Ft): ☐ N/A ☐ Unk	Is the Casing Perforated?	Perforation Depth (Ft): ☐ N/A ☐ Unk
☐ Yes ☐ No ☑ Unk ☐ N/A	From: To:	☐ Yes ☐ No ☑ Unk ☐ N/A	From: To:

Latitude (Decimal): 42.412589 ☑ Verified as accurate

Longitude (Decimal): -113.577628 ☑ Verified as accurate

All Sources

1. This source is:
   ☑ Active ☑ Proposed
   ☐ Inactive ☐ Emergency (Unplanned use)

WELL INFORMATION

yes	no	n/a	unk	note	
☑	☐	☐	☐	☐	2. Is the well on a separate lot? *(applicable if constructed after 11/1/77)*
☐ Significant		☐ Deficiency			

Are the following minimum distances from the PWS well being met?

yes	no	n/a	unk	note	
☑	☐		☐	☐	3. - Nearest property line......50 Ft.
☑	☐		☐	☐	4. - Any potential source of contamination......50 Ft. *(add comment)*
☑	☐		☐	☐	5. - Livestock......50 Ft.
☑	☐		☐	☐	6. - Canals, streams, ditches, lakes, ponds and tanks used to store nonpotable substances......50 Ft.
☑	☐		☐	☐	7. - Storm water facilities disposing storm water originating off the well lot......50 Ft.
☑	☐		☐	☐	8. - Class A Municipal Reclaimed Wastewater Pressure distribution line......50 Ft.
☑	☐		☐	☐	9. - Gravity wastewater line......50 Ft.
☑	☐		☐	☐	10. - Pressure wastewater line......100 Ft.
☑	☐		☐	☐	11. - Septic tank......100 Ft.
☑	☐		☐	☐	12. - Drainfield field......100 Ft.
☑	☐		☐	☐	13. - Seepage pit......100 Ft.
☑	☐		☐	☐	14. - Privies......100 Ft.
☑	☐		☐	☐	15. - Absorption module - large soil absorption system....150 - 300 Ft.
☑	☐		☐	☐	16. - Municipal or industrial wastewater treatment plant....500 Ft.
☑	☐		☐	☐	17. - Biosolids application site......1000 Ft.
☑	☐		☐	☐	18. - Reclamation and reuse of municipal and industrial wastewater sites......Permit specific
☑	☐	☐	☐	☐	19. Are frost free hydrants placed a minimum of five (5) feet away from the well? *(N/A if protected by AVB)*
☐	☑		☐	☐	20. Are pesticides, herbicides, fertilizers, portable containers of petroleum products, or other toxic or hazardous materials stored on the well lot?
☐	☑		☐	☐	21. Are pesticides, herbicides, or fertilizers applied to the well lot without prior approval from the Department?
☐	☑		☐	☐	22. Is the well in a pit? If yes, Date constructed:
☐	☐	☑	☐	☐	23. Was the well that is located in a pit installed after 11/5/64?
☐	☐	☑	☐	☐	24. If pit was installed prior to 11/5/64 – Has DEQ granted an exception and does the pit have water tight construction of pit walls and floor, a floor drain and an acceptable pit cover?
☑	☐	☐	☐	☐	25. Is the well protected from unauthorized entry? *(Recommended)*

COMMENTS:
(Please indicate question number)

WELL SOURCES - PG. 2

Common Name	SURVEY DATE		PWS #
Well #1	9/22/2016	(mm/dd/yyyy)	5160001

yes	no	n/a	unk	note	WELL INFORMATION (cont.)
☐	☑	☐	☐	☑	26. Does the casing extend a minimum of 18 inches above the final ground surface or 12 inches above the pump house floor?
☐ Significant		☐ Deficiency			
☑	☐	☐	☐	☐	27. Is the well vented with the open end of the vent screened with a 24 mesh and terminated downward at least 18 inches above the final ground surface or 12 inches above the pump house floor?
☑	☐		☐	☐	28. Is the well provided with an approved cap that prevents surface water entry?
☑	☐		☐	☐	29. Is the well cased and sealed in such a manner that surface water cannot enter the well?
☑	☐	☐	☐	☐	30. Is there a smooth nosed sample tap provided on the well discharge pipe prior to treatment?
☑	☐	☐	☐	☐	31. Is an instantaneous and totalizing flow meter equipped with nonvolatile memory installed on the pump distribution line of the well and is it maintained and working properly? 67976800 gallons
		☐ Unnecessary			
☑	☐	☐	☐	☐	32. Is a pressure gauge provided on all discharge piping and is it maintained and working properly? 110 psi.
☑	☐	☐	☐	☐	33. Can the well be pumped to waste at the design capacity of the well via an approved air gap at a location prior to the first service connection without depressurizing the distribution system?
☐ Significant		☐ Deficiency			

yes	no	n/a	unk	note	PUMP HOUSE *(Only pump houses that contain a ground water source)*
☑	☐	☐	☐	☐	34. Is the source located in a pump house?
☑	☐	☐	☐	☑	35. Is the pump house kept clean and in good repair?
☑	☐	☐	☐	☐	36. Is the pump house protected from unauthorized personnel?
☑	☐	☐	☐	☐	37. Does the pump house have adequate lighting throughout?
☑	☐	☐	☐	☐	38. Are all threaded hose bibs installed in the pump house equipped with an appropriate backflow prevention device?
☑	☐	☐	☐	☐	39. Is adequate ventilation provided in the pump house for dissipation of excess heat and moisture from the equipment?
☐ Significant		☐ Deficiency			
☑	☐	☐	☐	☐	40. Is adequate heating provided in the pump house to provided safe and efficient operation of equipment to prevent freezing?
☐ Significant		☐ Deficiency			
☑	☐	☐	☐	☐	41. Is the pump house protected from flooding, have adequate drainage, and is the ground surface graded so as to lead surface water away from the pump house? (Unless otherwise approved by the Department)
☐	☑	☐	☐	☐	42. Is the sump for pump house floor drains closer than 30 feet from the well?

COMMENTS:
(Please indicate question number)

#26 See Photo Number 2
#35 Well House Roof is leaking Rain Water. Also see photo Number 3 where there is visible corrosion on the manifold pipe where the chlorinator line connects to it.

WELL SOURCE - PG.1

SURVEY DATE: 9/22/2016 *(mm/dd/yyyy)*

PWS #: 5160001

A separate sources form must be filled out for **each** well associated to the PWS.

Tag #: E0007567

Common Name of Source: Well #2

Source associated with a: [ ] Wellfield [ ] Manifold

Is this Source Treated? [ ] Yes [ ] No

Treatment Objective: [x] N/A

Treatment Types: [x] N/A
(Identify Treatment Train in Comments)

Physical Location:
250 Vaughn Street

Is there a well log for the well source? [ ] Yes [ ] No [ ] N/A [x] Unk

Pump Capacity (GPM)	Casing Size (In)	Date Drilled:	Well Depth (Ft)	Casing Depth (Ft)	Grout Depth(Ft)	Static Water Depth (Ft)
390 [ ] Unk	12 [ ] Unk	1/1/1968 [ ] Unk	900 [ ] Unk	[ ] Unk	[x] Unk	55 [ ] Unk

Is the Casing Screened? [ ] Yes [ ] No [x] Unk [ ] N/A

Screen Depth (Ft): [ ] N/A [ ] Unk
From:
To:

Is the Casing Perforated? [ ] Yes [ ] No [x] Unk [ ] N/A

Perforation Depth (Ft): [ ] N/A [ ] Unk
From:
To:

Latitude (Decimal): 42.021667 [x] Verified as accurate

Longitude (Decimal): -113.0261111 [x] Verified as accurate

COMMENTS:
(Please indicate question number)

All Sources

1. This source is:
   [x] Active [ ] Proposed
   [ ] Inactive [ ] Emergency (Unplanned use)

WELL INFORMATION

yes	no	n/a	unk	note	Question
[x]	[ ]	[ ]	[ ]	[ ]	2. Is the well on a separate lot? *(applicable if constructed after 11/1/77)*

[ ] Significant [ ] Deficiency

Are the following minimum distances from the PWS well being met?

yes	no	n/a	unk	note	Question
[x]	[ ]		[ ]	[ ]	3. - Nearest property line..50 Ft.
[x]	[ ]		[ ]	[ ]	4. - Any potential source of contamination...................50 Ft. *(add comment)*
[x]	[ ]		[ ]	[ ]	5. - Livestock...50 Ft.
[x]	[ ]		[ ]	[ ]	6. - Canals, streams, ditches, lakes, ponds and tanks used to store nonpotable substances...........50 Ft.
[x]	[ ]		[ ]	[ ]	7. - Storm water facilities disposing storm water originating off the well lot.................................50 Ft.
[x]	[ ]		[ ]	[ ]	8. - Class A Municipal Reclaimed Wastewater Pressure distribution line....................................50 Ft.
[x]	[ ]		[ ]	[ ]	9. - Gravity wastewater line.......................................50 Ft.
[x]	[ ]		[ ]	[ ]	10. - Pressure wastewater line.................................100 Ft.
[x]	[ ]		[ ]	[ ]	11. - Septic tank..100 Ft.
[x]	[ ]		[ ]	[ ]	12. - Drainfield field...100 Ft.
[x]	[ ]		[ ]	[ ]	13. - Seepage pit..100 Ft.
[x]	[ ]		[ ]	[ ]	14. - Privies...100 Ft.
[x]	[ ]		[ ]	[ ]	15. - Absorption module - large soil absorption system....150 - 300 Ft.
[x]	[ ]		[ ]	[ ]	16. - Municipal or industrial wastewater treatment plant....500 Ft.
[x]	[ ]		[ ]	[ ]	17. - Biosolids application site.....................................1000 Ft.
[x]	[ ]		[ ]	[ ]	18. - Reclamation and reuse of municipal and industrial wastewater sites..Permit specific
[x]	[ ]	[ ]	[ ]	[ ]	19. Are frost free hydrants placed a minimum of five (5) feet away from the well? *(N/A if protected by AVB)*
[ ]	[x]		[ ]	[ ]	20. Are pesticides, herbicides, fertilizers, portable containers of petroleum products, or other toxic or hazardous materials stored on the well lot?
[ ]	[x]		[ ]	[ ]	21. Are pesticides, herbicides, or fertilizers applied to the well lot without prior approval from the Department?
[ ]	[ ]		[ ]	[ ]	22. Is the well in a pit? If yes, Date constructed:
[ ]	[ ]	[x]	[ ]	[ ]	23. Was the well that is located in a pit installed after 11/5/64?
[ ]	[ ]	[x]	[ ]	[ ]	24. If pit was installed prior to 11/5/64 -- Has DEQ granted an exception and does the pit have water tight construction of pit walls and floor, a floor drain and an acceptable pit cover?
[x]	[ ]	[ ]	[ ]	[ ]	25. Is the well protected from unauthorized entry? *(Recommended)*

WELL SOURCES - PG. 2	Common Name	SURVEY DATE		PWS #
	Well #2	9/22/2016	(mm/dd/yyyy)	5160001

yes	no	n/a	unk	note	WELL INFORMATION (cont.)
☑	☐	☐	☐	☐	26. Does the casing extend a minimum of 18 inches above the final ground surface or 12 inches above the pump house floor?
☐ Significant	☐ Deficiency				
☑	☐	☐	☐	☐	27. Is the well vented with the open end of the vent screened with a 24 mesh and terminated downward at least 18 inches above the final ground surface or 12 inches above the pump house floor?
☑	☐		☐	☐	28. Is the well provided with an approved cap that prevents surface water entry?
☑	☐		☐	☐	29. Is the well cased and sealed in such a manner that surface water cannot enter the well?
☑	☐	☐	☐	☐	30. Is there a smooth nosed sample tap provided on the well discharge pipe prior to treatment?
☑	☐	☐	☐	☐	31. Is an instantaneous and totalizing flow meter equipped with nonvolatile memory installed on the pump distribution line of the well and is it maintained and working properly? 3305807 gallons
		☐ Unnecessary			
☑	☐	☐	☐	☐	32. Is a pressure gauge provided on all discharge piping and is it maintained and working properly? 100 psi.
☑	☐	☐	☐	☐	33. Can the well be pumped to waste at the design capacity of the well via an approved air gap at a location prior to the first service connection without depressurizing the distribution system?
☐ Significant	☐ Deficiency				

yes	no	n/a	unk	note	PUMP HOUSE *(Only pump houses that contain a ground water source)*
☑	☐	☐	☐	☐	34. Is the source located in a pump house?
☑	☐	☐	☐	☐	35. Is the pump house kept clean and in good repair?
☑	☐	☐	☐	☐	36. Is the pump house protected from unauthorized personnel?
☑	☐	☐	☐	☐	37. Does the pump house have adequate lighting throughout?
☑	☐	☐	☐	☐	38. Are all threaded hose bibs installed in the pump house equipped with an appropriate backflow prevention device?
☑	☐	☐	☐	☐	39. Is adequate ventilation provided in the pump house for dissipation of excess heat and moisture from the equipment?
☐ Significant	☐ Deficiency				
☑	☐	☐	☐	☐	40. Is adequate heating provided in the pump house to provided safe and efficient operation of equipment to prevent freezing?
☐ Significant	☐ Deficiency				
☑	☐	☐	☐	☐	41. Is the pump house protected from flooding, have adequate drainage, and is the ground surface graded so as to lead surface water away from the pump house? (Unless otherwise approved by the Department)
☐	☑	☐	☐	☐	42. Is the sump for pump house floor drains closer than 30 feet from the well?

COMMENTS:
(Please indicate question number)

STORAGE

SURVEY DATE: 9/22/2016 (mm/dd/yyyy) | PWS #: 5160001

A separate storage form must be filled out for **each** storage unit in the PWS.

Storage Structure Name: Storage Tank

Storage Structure ID #:

Physical Location: NW of Town on Kelly road

Date in service: ☐ Unk — 1992

Volume (gal): ☐ Unk — 125000

Storage Type:
- ☑ Reservoir/Tank
- ☐ Standpipe

Construction:
- ☐ Above-Ground
- ☐ Ground-Level
- ☑ Partially Buried
- ☐ Below-Ground

Type of material:
- ☐ Plastic
- ☐ Wood
- ☐ Fiberglass
- ☐ Metal
- ☑ Concrete
- ☐ Naturally Contained

Total Days Supply (This structure): 2 day average ☐ Unk

Date Last: Inspected: ☐ Unk — 2014 (see note)

Cleaned: ☐ Unk — 2014

How is the water level measured? ☐ Unk — pressure transducer

COMMENTS: (Please indicate question number)

Operator stated that the tank is scheduled for inspection this year.

ALL STORAGE STRUCTURES

yes	no	n/a	unk	note	
☑	☐	☐	☐	☐	1. Is the storage structure safely accessible to the inspector?
☐	☑	☐	☐	☐	2. Is the PWS storage tank located within 500 feet of any municipal or industrial wastewater treatment plant or any land which is spray irrigated with wastewater or used for sludge disposal?
☐	☑	☐	☐	☐	3. Are any of the storage structure drains directly connected to a sewer or storm drain?
☑	☐	☐	☐	☐	4. Is an overflow provided that discharges to daylight in a way that will preclude the possibility of backflow to the reservoir and, where practical, provided with an expanded metal screen installed within the pipe that will exclude rodents and deter vandalism?
☑	☐	☐	☐	☐	5. Are overflows brought down to an elevation between 12 and 24 inches above the receiving surface? *(2X the diameter of the discharge pipe above a basin rim)*
☑	☐	☐	☐	☐	6. Do overflows discharge over a drainage inlet structure or splash plate?(storm or sanitary)
☑	☐	☐	☐	☐	7. Is the storage structure secure from unauthorized access?
☑	☐	☐	☐	☐	8. Does the storage reservoir have a watertight roof or cover and is it sloped to facilitate drainage?
☑	☐	☐	☐	☐	9. Is the storage water protected from contamination?
☑	☐	☐	☐	☐	10. Is the storage structure structurally sound?
☐	☑	☐	☐	☐	11. Could vegetation in the area potentially impact the storage structure?*(Recommended)*
☑	☐	☐	☐	☐	12. Is the storage structure designed so that it can be isolated from the distribution system without necessitating loss of pressure in the distribution system?
☐	☑	☐	☐	☐	13. Is leakage evident at time of inspection?
☐	☑	☐	☐	☐	14. Is the storage structure interior coating or liner peeling or cracked?
☑	☐	☐	☐	☐	15. Is the storage structure used to store finished water?
☑	☐	☐	☐	☐	16. Are access manhole openings for the storage structure 4 inches or greater above the surface of the roof, with a cover 2 inches overlapping, water tight, hinged and locked?
☑	☐	☐	☐	☐	17. Are all vents extended 12 inches above the roof and constructed to exclude potential sources of contamination? *(The overflow pipe shall not be considered a vent)*

ABOVE GROUND STORAGE

yes	no	n/a	unk	note	
☐	☐	☑	☐	☐	18. Do all vents open downward and are they fitted with a 24 mesh non-corrodible screen?

GROUND-LEVEL, PARTIALLY BURIED, or BELOW-GROUND STORAGE

yes	no	n/a	unk	note	
☑	☐	☐	☐	☐	19. Does the overflow for the storage structure have a vertical section of pipe at least 2 pipe diameters in length?
☑	☐	☐	☐	☐	20. Is the overflow for the storage structure provided with either a 24 mesh non-corrodible screen installed within the pipe when practical, or an expanded metal screen installed within the pipe plus a weighted flapper or check?
☑	☐	☐	☐	☐	21. Is the area surrounding the storage structure graded in a manner that will prevent surface water from standing within 50 feet of it?
☑	☐	☐	☐	☐	22. Are all vents for the storage structure open downward with the opening at least 24 inches above the roof or the ground level and covered with 24 mesh non-corrodible screen to exclude potential contamination?

PARTIALLY BURIED OR BELOW-GROUND STORAGE

yes	no	n/a	unk	note	
☐	☐	☑	☐	☐	23. Are "ALL" manholes elevated 24 inches above the surface of the roof or the ground level, which ever is higher?
☐	☐	☑	☐	☐	24. Is there a minimum distance of 50 feet between the storage structure and any non-potable main, standing water, or other possible source of contamination?

DISTRIBUTION

One form for all distribution systems in the PWS.

SURVEY DATE		PWS #
9/22/2016	(mm/dd/yyyy)	5160001

What are water lines made of:

Material(s): ☐ Unk

☐ Steel ☐ HDPE (black) ☐ Asbestos/Cement

☑ PVC ☑ Ductile Iron ☐ Copper

☐ Other:

Size(s): ☐ Unk

6, 10, and 12"

How many services are metered?

151 out of 151

Number of Fire Hydrants:

27

COMMENTS:
(Please indicate the question number)

DISTRIBUTION

yes	no	n/a	unk	note	DISTRIBUTION
☐	☑	☐	☐	☐	1. Have there been any interruptions in service during the past year? (including pressure loss)
☐	☐	☑	☐	☐	2. If a loss of pressure occurred (<20 psi), did the PWS provide public notice and disinfect the system? *(Reminder)*
☑	☐	☐	☐	☐	3. Is the PWS able to maintain a minimum pressure of twenty (20) psi throughout the distribution system (including fire flow), or forty (40) psi for PWSs constructed after 7/1/1985 (excluding fire flow), during maximum hourly demand conditions?
☐	☑	☐	☐	☐	4. Was the pressure observed at a service connection?
					5. If yes: ___ psi. Location: ___ Time: ___ ☐ A.M. ☐ P.M.

yes	no	n/a	unk	note	
☑	☐	☐	☐	☐	6. Do all water mains that provide fire flow have a diameter of at least 6 inches?
☑	☐	☐	☐	☐	7. Are valves exercised regularly? *(Recommended)* If yes, how often?
☑	☐	☐	☐	☐	8. Is there a leak detection program? *(Recommended)*
☐	☑	☐	☐	☐	9. Does the system have leaking water mains that need to be repaired or replaced?
☑	☐	☐	☐	☐	10. Is a water conservation program in effect? *(Recommended)*
☑	☐	☐	☐	☐	11. Is an adequate map of the distribution system maintained? *(Recommended)*
☑	☐	☐	☐	☐	12. Does the system flush all main lines annually? *(Recommended)*
☑	☐	☐	☐	☐	13. Are all dead end water mains equipped with a means to flush?
☑	☐	☐	☐	☐	14. If yes, are the deadends flushed at least semiannually?
☐	☑	☐	☐	☐	15. Are there any distribution materials used that should not be in contact with the drinking water? *If yes, explain in comments section.*
☑	☐	☐	☐	☐	16. Is the system adequately protected from freezing?
☑	☐	☐	☐	☐	17. Is there a cross connection control program that complies with the Rules and is it being implemented? (Community PWSs Only)
☑	☐	☐	☐	☐	18. Is the operator trained in cross connection control? *(Recommended)*
☐	☑	☐	☐	☐	19. Are there any known unprotected cross connections or were any unprotected cross connections observed during the course of the survey?
☐	☐	☑	☐	☐	20. If a separate non-potable irrigation system is provided for the consumer, are all mains, hydrants, and appurtenances easily identified as non-potable? (Purple Tape or other) *(Recommended)*

yes	no	n/a	unk	note	**Air/Vacuum Relief Valves** - *Placed at high points in water mains.*
☐	☐	☑	☐	☐	21. Are all automatic air relief valves equipped with a means of backflow protection?

PUMPING - PG. 1

One form for all Pumps.

SURVEY DATE: 9/22/2016 (mm/dd/yyyy)

PWS #: 5160001

PUMPS, PUMPHOUSES, AND CONTROLS

Pump ID#:	Physical Location:	Type of Pump:	Brand:	Model:	Horsepower:	Purpose:
	Well #1	Submersible	Goulds Pump	7CLC-3 stg	35	WITHDRAW
	Well #1	C12 Metering Pum	Pulsefeeder	LB03SA	1/4	CHOLORINE INJ.
	Well #2	Submersible	Franklin	FPS376STS40D6X-0964	40	WITHDRAW

ALL PUMPS

yes	no	n/a	unk	note	
☐	☑	☐	☐	☐	1. Does the pump(s) cycle excessively? *(Recommended)*
☑	☐	☐	☐	☐	2. Are all pumps provided with readily available spare parts and tools?
☑	☐	☐	☐	☐	3. Does the system have an approved method to prevent excessive pressure development?
☑	☐	☐	☐	☐	4. Is a standard pressure gauge installed and functioning on the discharge line?

WELL PUMPS

yes	no	n/a	unk	note	
☑	☐	☐	☐	☐	5. Is there an accessible check valve installed in the discharge line of each well between the pump and the shut-off valve?
☐	☐	☑	☐	☐	6. If the system has a vertical turbine motor driven pump(s), is an air release-vacuum relief valve located upstream from the check valve, with exhaust/relief piping terminating in a down-turned position at least 18 inches above the floor and covered with a 24 mesh corrosion resistant screen?
☐	☐	☑	☐	☐	7. If the pump(s) is "oil lubricated", is the oil NSF approved and suitable for human consumption?

WATER PUMPS *(not well pumps)*

yes	no	n/a	unk	note	
☑	☐	☐	☐	☐	8. Is an accessible check valve on the discharge side between the pump and the shut-off valve?

AUXILIARY POWER

yes	no	n/a	unk	note	
☐	☑	☐	☐	☑	9. Is there auxiliary power on-site? (Community PWSs Only)
☐ Significant		☐ Deficiency			
☑	☐	☐	☐	☑	10. Is auxiliary power tested? *(Recommended)*
☐	☐	☑	☐	☐	11. If a diesel or gasoline fueled engine is used on the well lot; is the fuel tank and connecting piping double walled?
☐	☐	☑	☐	☐	12. Is the fuel tank above ground?
☐	☐	☑	☐	☐	13. Is a certified operator present during the filling of the fuel tank?
☐	☐	☑	☐	☐	14. If the engine is in the well house, is the engine exhaust directly discharged outside the well house?
☐	☐	☑	☐	☐	15. Is a spill containment structure surrounding all fuel tanks adequate? *(Secondary containment - 110% fuel tank volume)*

Community Systems Only

yes	no	n/a	unk	note	
☐	☐	☑	☐	☐	16. *(Community Systems built or substantially modified after 4/15/07 only)* Is on-site power or standbystorage provided so water can be treated and supplied to pressurize theentire distribution system during a power outage for a minimum of 8 hours?
☐	☐	☑	☐	☐	17. *(Community Systems built or substantially modified after 4/15/07 only)* If standby power is provided, is there a minimum of 8 hours of fuel stored and located on site?

COMMENTS:
(Please indicate the question number)

#9 - Operator stated that power outages are seldom and for this reason, backup power is not needed.

SURVEY DATE 9/22/2016 (mm/dd/yyyy) PWS # 5160001

COMMENTS:
(Please indicate the question number)

yes	no	n/a	unk	note	BOOSTER PUMPS
☐	☐	☑	☐	☐	18. Is an instantaneous and totalizing flow meter installed where the booster pump is directly connected to the distribution system?
		☐ Unnecessary			
☐	☐	☑	☐	☐	19. Are all in-line booster pumps supplied with an automatic cutoff that activates when intake pressure is less than or equal to 5 psi?
☐	☐	☑	☐	☐	20. Is the booster pump located on a suction line that is directly connected to any storage reservoir?
☐	☐	☑	☐	☐	21. If yes, are all booster pumps protected by an automatic cutoff to prevent pump damage and avoid excessive reservoir drawdown?

yes	no	n/a	unk	note	PUMP HOUSE *(Only pump houses that don't contain a ground water source)*
☐	☐	☑	☐	☐	22. Is the pump house kept clean and in good repair?
☐	☐	☑	☐	☐	23. Is the pump house protected from unauthorized personnel?
☐	☐	☑	☐	☐	24. Does the pump house have adequate lighting throughout?
☐	☐	☑	☐	☐	25. Are all non-sample taps installed in the pump house equipped with an appropriate backflow prevention device?
☐	☐	☑	☐	☐	26. Is adequate ventilation provided in the pump house for dissipation of excess heat and moisture from the equipment?
☐ Significant		☐ Deficiency			
☐	☐	☑	☐	☐	27. Is adequate heating provided in the pump house to provided safe and efficient operation of equipment *(prevent moisture buildup and/or freezing)*?
☐ Significant		☐ Deficiency			
☐	☐	☑	☐	☐	28. Is the pump house protected from flooding, have adequate drainage, and is the ground surface graded so as to lead surface water away from the pump house? (Unless otherwise approved by the Department)
☐	☐	☑	☐	☐	29. Is the sump for pump house floor drains closer than 30 feet from the well?
☐	☐	☑	☐	☐	30. Is the floor drain connected to sewer, storm drains, chlorination room drains, or any other source of contamination? (Unless otherwise approved by the Department)

FINANCIAL CAPACITY

SURVEY DATE: 9/22/2016 (mm/dd/yyyy)

PWS #: 5160001

yes	no	n/a	unk	note	FINANCIAL CAPACITY
☑	☐	☐	☐	☐	1. Is the PWS current with the payment of drinking water fees?
☑	☐	☐	☐	☐	2. Does the PWS charge a drinking water fee to the user? If yes, what is the fee: $ See Attached
☑	☐	☐	☐	☐	3. Is the PWS in the business of selling water?
					#3 Note: → **- If no, identify why in the comments section and mark "N/A" on questions 4 - 19.**
☑	☐	☐	☐	☐	4. Does the PWS provide and use an annual budget? *(Recommended)*
☑	☐	☐	☐	☐	5. If applicable, is the PWS fund separate from the waste water/sewer utility fund? *(Recommended)*
☑	☐	☐	☐	☐	6. Do water system revenues exceed expenditures? *(Recommended)*
☑	☐	☐	☐	☐	7. Are controls established to prevent expenditures from exceeding revenues?
☑	☐	☐	☐	☐	8. Has an independent financial audit been completed? *(Recommended)*
☑	☐	☐	☐	☐	9. If yes, is a copy of the most recent balance sheet for the water system available? *(Recommended)*
☑	☐	☐	☐	☐	10. Does the water system include a cash budget within its annual budget for cash flow? *(Recommended)*
☑	☐	☐	☐	☐	11. Does the water system management review the user fee, user charge, or rate system at least annually? *(Recommended)*
					12. When was the last user fee, user charge, or rate system adjustment? **7/1/2013** *mm/dd/yyyy*
☑	☐	☐	☐	☐	13. Does the water system management review financial reports at least monthly? *(Recommended)*
☑	☐	☐	☐	☐	14. Does the PWS provide and use a capital budget? *(Recommended)*
☑	☐	☐	☐	☐	15. Has this PWS produced and does it currently utilize a capital improvements plan? *(Recommended)*
					16. If yes, when was the capital improvements budget produced? **>9 years ago** *mm/dd/yyyy*
☑	☐	☐	☐	☐	17. Has the capital improvement budget been updated in the last 18 months? *(Recommended)*
☑	☐	☐	☐	☐	18. Does the water system budget provide funding for depreciation of existing plant in service and/or for the funding of reserves for system replacement?
☑	☐	☐	☐	☐	19. Are there sufficient funds for training personnel?

COMMENTS:
(Please indicate the question number)

	SURVEY DATE		PWS #
MANAGERIAL CAPACITY	09/22/2016	*(mm/dd/yyyy)*	5160001

MANAGERIAL CAPACITY

COMMENTS:
(Please indicate the question number)

yes	no	n/a	unk	note	MANAGERIAL CAPACITY
☑	☐	☐	☐	☐	1. Is a properly licensed operator available at all times? (N/A for GW-NC PWS)
☑	☐	☐	☐	☐	2. Does this PWS have a governing body or board of directors?

If no, please indicate:
- ☐ Sole Proprietorship
- ☐ Partnership
- ☐ Limited Liability Corp.
- ☑ Other: **Incorporated City**

3. How often does the board meet? ☐ N/A

☐ weekly	☐ semi-annually	☐ never
☑ monthly	☐ annually	☐ unknown
☐ bimonthly	☐ as necessary	☐ other:

yes	no	n/a	unk	note	Are the following records maintained onsite or located near by?
☑	☐	☐	☐	☐	4. - Bacteriological Analysis - **5 years retention.**
☑	☐	☐	☐	☐	5. - Chemical Analysis - **10 years retention.**
☑	☐	☐	☐	☐	6. - Records of actions taken to correct violations - **3 years retention.**
☑	☐	☐	☐	☐	7. - Copies of reports, summaries or communication related to sanitary surveys - **10 years retention.**
☑	☐	☐	☐	☐	8. - Reports concerning variances or exemptions - **5 years retention.**
☑	☐	☐	☐	☐	9. - Copies of public notices issued - **3 years retention.**
☑	☐	☐	☐	☐	10. - Daily free chlorine residuals *(required disinfection)* - **1 year retention.**
☑	☐	☐	☐	☐	11. Does the system owner have an Asset Management Plan? *(Recommended)*
☑	☐	☐	☐	☐	12. Is an operation and maintenance manual(s) provided for the PWS and does it include; water system specific operations plans; maintenance information and checklists; and manufacturer's product information, etc?
☐ Significant		☐ Recommend			
☑	☐	☐	☐	☐	13. Is there a clear plan of organization and control among the people responsible for management and operations of the water system? *(Recommended)*

yes	no	n/a	unk	note	Are any samples of the following parameters past due?
☐	☑	☐	☐	☐	14. Coliform
☐	☑	☐	☐	☐	15. Nitrates
☐	☑	☐	☐	☐	16. Nitrites
☐	☑	☐	☐	☐	17. Lead and Copper
☐	☑	☐	☐	☐	18. IOCs
☐	☑	☐	☐	☐	19. VOCs
☐	☑	☐	☐	☐	20. SOCs
☐	☑	☐	☐	☐	21. Disinfection Byproducts
☐	☑	☐	☐	☐	22. Radionuclide
☑	☐	☐	☐	☐	23. Is a written total coliform rule (TCR) sample site plan available for review?
☑	☐	☐	☐	☐	24. Does the (TCR) sample site plan meet the minimum requirements?
☑	☐	☐	☐	☐	25. Does the system have a sufficient supply of approved sampling bottles properly stored? *(Recommended)*

yes	no	n/a	unk	note	
☑	☐	☐	☐	☐	26. Does the PWS provide stairways, ladders and handrails where needed?
☑	☐	☐	☐	☐	27. Are treads of non-slip material provided where needed?
☐	☑	☐	☐	☐	28. Is a health concern produced from inadequately protected electrical wiring?
☑	☐	☐	☐	☐	29. Does the system have any confined spaces?
☑	☐	☐	☐	☐	30. If yes, are protocols followed for confined space entry? *(Recommended)*
☐	☑	☐	☐	☐	31. Are there any unused subsurface water storage tanks that need to be abandoned?
☐	☑	☐	☐	☐	32. Are there any water supply wells that are no longer being used that need to be abandoned?

yes	no	n/a	unk	note	
☑	☐	☐	☐	☐	33. Does the system utilize SCADA?

TREATMENT APPLICATION & CONTROL

A separate form must be filled out for **each** Treatment Application in the PWS.

Survey Date		PWS #
9/22/2016	*(mm/dd/yyyy)*	5160001

Purpose of Treatment:	Treatment Facility Location:	Date Online: ☐ Unk	Treated Water (GPD): ☐ Unk
Disenfection	Well #1	2003	

Identify **one** process in the treatment train for inspection: ☐ N/A

☐ Sedimentation Basin ☐ Filtration ☐ Blending ☐ Oxidation ☐ Ion Exchange ☐ Aeration ☐ Reverse Osmosis ☐ Sequestration by Polyphosphates
☐ Detention Basin ☐ Chemical Coagulation ☐ Softening ☑ Disinfection (Complete Disinfection Mod.) ☐ Sequestration by Sodium Silicates

Sources Treated by Facility: (Tag #)	Equipment Manufacturer:	Model #:
Well #1	Pulsafeeder	A plus

Chemical Trade Name:	Chemical Manufacturer:	NSF/ANSI certified?
		☑ Yes ☐ No ☐ N/A ☐ Unk
Sodium Hypochlorite	t chlor	☐ Yes ☐ No ☐ N/A ☐ Unk
		☐ Yes ☐ No ☐ N/A ☐ Unk

Comments:
(Please indicate the question number)

WASTE HANDLING and DISPOSAL

yes	no	n/a	unk	note	
☐	☐	☑	☐	☐	1. Are provisions made for proper disposal of water treatment plant waste such as sanitary, laboratory, clarification sludge, softening sludge, iron sludge, filter backwash water, brines and treatment media?
		☐		☐	2. If yes, how are wastes being disposed of? (Identify in comments)

SAMPLE TAPS

yes	no	n/a	unk	note	
☑	☐	☐	☐	☐	3. Are sampling taps provided prior to and after each form of treatment? (Sample tap must be of the smooth-nosed type if sample is for bacteriological analysis)

☐ N/A 4-23 **CHEMICAL APPLICATION** If no chemical applied, questions 4-23 are n/a

yes	no	n/a	unk	note	
☑	☐	☐	☐	☐	4. Are spare parts available for all chemical feeders to replace parts which are subject to frequent wear and damage?
		☐			5. Are the feeders manually or automatically controlled? ☐ Manual ☑ Automatic
☑	☐	☐	☐	☐	6. For chemical application control systems, is the chemical feeder controlled by a flow sensing device so that injection of the chemicals will not continue when the flow of water stops?
☑	☐	☐	☐	☐	7. Are chemical feed rates proportional to flow?
☑	☐	☐	☐	☐	8. Are provisions made for measuring the quantities of chemicals used?
☑	☐	☐	☐	☐	9. Is cross-connection control provided on the service water lines that discharge to the solution tanks?
☑	☐	☐	☐	☐	10. Is cross-connection control provided so that liquid chemical solutions cannot be siphoned through solution feeders into the water supply?
☑	☐	☐	☐	☐	11. Is the chemical feed equipment readily accessible for servicing, repair, and observation of operation?
☑	☐	☐	☐	☐	12. Is space provided for convenient/efficient storage & handling of chemicals? *(Recommended)*
☐	☑	☐	☐	☐	13. Are chemicals that are incompatible stored or handled together?
☑	☐	☐	☐	☐	14. Are chemical solution tanks kept covered?
☑	☐	☐	☐	☐	15. Are chemical solution tank overflow pipes, when provided, turned downward with the end screened? *(Recommended)*
☑	☐	☐	☐	☐	16. Do chemical solution tank overflow pipes, when provided, have free fall discharge? *(Recommended)*
☑	☐	☐	☐	☐	17. Where more than one (1) chemical is stored or handled, are tanks and pipelines clearly labeled to identify the chemical they contain?
☑	☐	☐	☐	☐	18. Are floor surfaces smooth and impervious, slip-proof and well drained? *(Recommended)*
☑	☐	☐	☐	☐	19. Are vents from feeders, storage facilities and equipment exhaust discharged to the outside atmosphere above grade and remote from air intakes?
☑	☐	☐	☐	☐	20. Are chemical shipping containers fully labeled to include chemical name, purity, concentration, supplier name and address, and evidence of ANSI/NSF certification?
☑	☐	☐	☐	☐	21. Are acids and caustics kept in closed corrosion-resistant shipping containers or storage units?
☑	☐	☐	☐	☐	22. Are at least one pair of rubber gloves, a dust respirator of a type certified by NIOSH for toxic dusts, an apron or other protective clothing and goggles or face mask provided for each operator as required by the reviewing authority?
☑	☐	☐	☐	☐	23. Is a deluge shower and/or eyewashing device installed where strong acids and alkalis are used or stored?

Important: the "Treatment Application" module also needs to be filled out for each facility that utilizes disinfection

DISINFECTION - Systems Using Only Ground Water

A separate form must be filled out for each disinfection unit in the PWS.

Survey Date		PWS #
9/22/2016	(mm/dd/yyyy)	5160001

Treatment Facility Name:	Treatment Facility Location:	Date Online: ☐ Unk	Treated Water (GPD): ☐ Unk
Chlorinator	Well #1	2003	

Select all disinfection types used:

☐ Gas cl2 ☐ UV Light ☑ Sodium Hypochlorite ☐ Calcium Hypochlorite ☐ Miox ☐ Ozone ☐ Chlorine Dioxide ☐ Other

yes	no	n/a	unk	note	DISINFECTION
☑	☐	☐	☐	☐	1. Is disinfection used on a voluntary basis to prevent bacterial contamination of the distribution system?
☐	☑	☐	☐	☐	2. Any interruptions in disinfection in the past year? If yes, comment.
☐	☑	☐	☐	☐	3. Have any changes been made to this treatment facility since the last ESS?
☐	☐	☑	☐	☐	4. If yes, were plans and specs submitted to DEQ? Date approved:
☐	☐	☐	☐	☐	5. Does the system have a means of measuring the residual disinfectant concentrations of free chlorine, combined chlorine (chloramines), and/or chlorine dioxide?
☑	☐	☐	☐	☐	6. Is a smooth nosed sample tap provided before and after treatment?
☑	☐	☐	☐	☐	7. Is a chlorine residual being recorded when all compliance total coliform samples are being taken?

yes	no	n/a	unk	note	VOLUNTARY CHLORINATION
☑	☐	☐	☐	☐	8. Is a measurable free chlorine residual maintained throughout the distribution system? *(Recommended)*
☑	☐	☐	☐	☐	9. Is the free chlorine residual being measured daily? *(Recommended)*
☑	☐	☐	☐	☐	10. Is an automatic proportioning chlorinator being used where the rate of flow or chlorine demand is not reasonably constant?
☑	☐	☐	☐	☐	11. Is the analysis for free chlorine residual being made at a frequency that is sufficient to detect variations in chlorine demand or changes in water flow?

yes	no	n/a	unk	note	REQUIRED DISINFECTION
☐	☐	☑	☐	☐	12. Is the free chlorine residual being measured daily at a location prior to the first service connection?
☐	☐	☑	☐	☐	13. Is the daily free chlorine residual being recorded and kept on file for a minimum of 1 year?
☐	☐	☑	☐	☐	14. Is a detectable chlorine residual maintained throughout the distribution system?
☐	☐	☑	☐	☐	15. Is an automatic proportioning chlorinator being used where the rate of flow or chlorine demand is not reasonably constant?
☐	☐	☑	☐	☐	16. Where chlorination is required for protection of the supply, is there standby equipment of sufficient capacity available to replace the largest unit?
☐	☐	☑	☐	☐	17. If primary disinfection is accomplished using ozone or some other chemical that does not provide a residual disinfectant, is chlorine added to provide a residual disinfectant?

Comments:
(Please indicate the question number)

State of Idaho
Department of Environmental Quality
Photo Log

Name of Facility:		Inspection Date		PWS#
City of Albion		9/22/2016	*(mm/dd/yyyy)*	5160001
Camera Type:	Camera Brand:	Camera Model:		Camera ID#:
☑ Digital ☐ 35mm ☐ Other:	Apple	iPhone 5		F17K1D8ADTTN

Photo:	Date:	By: (initials)	Direction: (N,S,E,W, etc.)	File Name:	Description:
1	9/22/2016	spl		Photo 1.JPEG	Well House #1
2	9/22/2016	spl		Photo 2.JPEG	Well Casing is Flush with Ground Surface
3	9/22/2016	spl		Photo 3.JPEG	Visible Corrosion on manifold pipe where Chlorinator injection line connects
4	9/22/2016	spl		Photo 4.JPEG	Chlorinator Tank
5	9/22/2016	spl		Photo 5.JPEG	1 Gallon Chlorinator Containers
6	9/22/2016	spl		Photo 6.JPEG	Well House #1 Pump to Waste Line Does not Drain to a Splash Pad
7	9/22/2016	spl		Photo 7.JPEG	Well House #2
8	9/22/2016	spl		Photo 8.JPEG	Well House #2 Well Casing
9	9/22/2016	spl		Photo 9.JPEG	Well House Number 1 Roof Leak
10	9/22/2016	spl		Photo 10.JPEG	Well House #2 Pump to Waste Line Does not Drain to a Splash Pad
11	9/22/2016	spl		Photo 11.JPEG	Partially Buried 125K Concrete Storage Tank

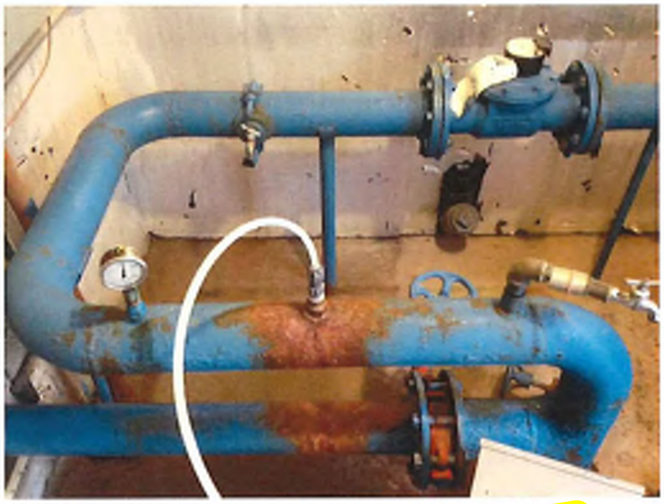
The photographers signature below signifies that the images identified on this photo log have not been tampered with and are representative of what was seen in the field.

Photographer(s) Signature(s): [signature] Date: 9/27/2016

Idaho Department of Environmental Quality
Photographic Documentation For City of Albion

Photograph 1: Well House #1

Photograph 2: Well 1 Casing is Flush with the Ground Surface



Photograph 3: Visible Corrosion on Manifold Pipe Where Chlorinator Injection Line Connects

Photograph 4: Chlorinator Tank

Photograph 5: 1 Gallon Chlorinator Containers

Photograph 6: Well House #1 Pump to Waste Line Does Not Drain to A Splash Pad

Photograph 7: Well House #2

Photograph 8: Well House #2 Well Casing

Photograph 9: Well House #1 Roof Leak

Photograph 10: Well House #2 Pump to Waste Line Does Not Drain to A Splash Pad

Photograph 11: Partially Buried 125K Concrete Storage Tank

Exhibit A

Fees and Rates are hereafter established by Resolution of the City Council regarding Electrical, Water and Sewer rates in and for the City of Albion. The current rate structures are as follows:

Electrical

Category of Use		Monthly Base Rate	Metered Rate
Standard		$9.00	8.66 ¢/Kw
Part-time or Vacation Occupancy			
	Occupied	$9.00	8.66 ¢/Kw
	Absent	$9.00	8.66 ¢/Kw
Unoccupied		$0.00	$0.00
Vacant	Service	$9.00	8.66 ¢/Kw
	No Service	$0.00	$0.00

Water

Category of Use		Monthly Base Rate	Metered Rate[1]
Standard			
	5/8 in. service	$31.50	
	3/4 in. service	$36.57	
	1 in. service	$36.89	
	1 ½ in. service	$43.56	
	2 in. service	$46.73	

Part-time or Vacation Occupancy

	Monthly Base Rate	
Size of Service	Occupied[2]	Absent
5/8 in. service	$31.50	$16.25
3/4 in. service	$36.57	$18.29
1 in. service	$36.89	$18.45
1 ½ in. service	$43.56	$21.78
2 in. service	$46.73	$23.37

[1] Water usage is charged on a per Thousand gallon basis at the following rates:
$0.20 per 1000 gallons for water usage in excess of 25,000 but not exceeding 150,000 gallons
$2.40 per 1000 gallons for water usage in excess of 150,000 gallons

[2] The fee indicated below for "Occupied" structures is the monthly base rate, based upon size of service line. Any water usage is additionally charged on a "per gallon metered usage" as is set forth in footnote 1.

Unoccupied			
		$0.00	$0.00
Vacant			
	Size of Service	Rate/use service[3]	Locked Meter
	5/8 in. service	$31.50	$16.25
	3/4 in. service	$36.57	$18.29
	1 in. service	$36.89	$18.45
	1 ½ in. service	$43.56	$21.78
	2 in. service	$46.73	$23.37
	No Service	$0.00	$0.00

Sewer

Category of Use			Monthly Base Rate	Metered Rate
Standard				no metered rates
	Residential		$45.00	for sewer
	Commercial		$65.00	
Part-time or Vacation Occupancy				
	Occupied			
		Residential	$45.00	
		Commercial	$65.00	
	Absent			
		Residential	$22.50	
		Commercial	$32.50	
Unoccupied			$0.00	$0.00
Vacant	Service			
	No Service		$0.00	$0.00

[3] Metered water rate usage applies as set forth in footnote 1.

APPENDIX E: HYDRAULIC MODEL

- Fire Flow Testing Results
- 2021 Max Day Demand + Fire Flow Results
- 2021 Peak Hour Demand Results
- 2021 Average Day Demand Results
- 2041 Max Day Demand + Fire Flow Results w/ Improvements

Well #1 Pump Curve
7/1/2021

H (psi)	Q (gpm)	
85	94.5	Normal operating pressure
90	0	Dead heading pump
88	80	Throttled valve
40	270	Open hydrant

[illegible]

Well #2 Pump Curve
7/1/2021

H (psi)	Q (gpm)	flow meter totalizer readings	
95	350	50 - 85	Normal operating pres
180	0	20 - 55	Dead heading pump
125	270	30 - 57	Throttled valve
15	500	90 - 40	Open hydrant

50

Pressure Hydrant A

Gauge #8

Test No.	Hydrant Location or ID number	Time of Static Reading	Static Pressure	Time of Residual Reading	Residual Pressure	Pressure Drop (static minus residual)
1	Previously unknown	10:15	70	10:18	34	
2	Address 340 North St.	10:47	96	10:50	51	
3	Albion Mercantile Co.	11:07	85	11:10	44	
4	544 School St.	11:28	76	11:31	30	
5	Central Ave & Main St.	11:50	81	11:53	33	
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

Notes:

1 Take pressures to the nearest 1 psi
2 Aim for a pressure drop of about 10 psi from static to residual
3 Wait until the gauge needle settles on a fixed range before taking a residual pressure reading
4 Once the gauge has settled on a fixed range, take the average value if the needle is bouncing

Gauge #1

Pressure Hydrant B

across the [illegible]
meet from [illegible]

Test No.	Hydrant Location or ID number	Time of Static Reading	Static Pressure	Time of Residual Reading	Residual Pressure	Pressure Drop (static minus residual)
1	Lounsbury Ave & Main St.	10:15	80 psi	10:18	54 psi	26 psi
2	248 E North St	10:47	94 psi	10:50	60 psi	34 psi
3	West St & North St	11:07	87 psi	11:10	76 psi	11 psi
4	Piece St. & Central Ave	11:28	76 psi	11:31	30 psi	46 psi
5	Tremayne St. Main St.	11:50	85 psi	11:53	40 psi	45 psi
6						
7						
8						
9						
10						
11						
12						
13						
14						
15	~~1st & Maple~~	~~9:44~~	~~78 psi~~	~~9:47~~	~~65 psi~~	

Notes:

1 Take pressures to the nearest 1 psi
2 Aim for a pressure drop of about 10 psi from static to residual
3 Wait until the gauge needle settles on a fixed range before taking a residual pressure reading
4 Once the gauge has settled on a fixed range, take the average value if the needle is bouncing

Flow Hydrant Record Sheet

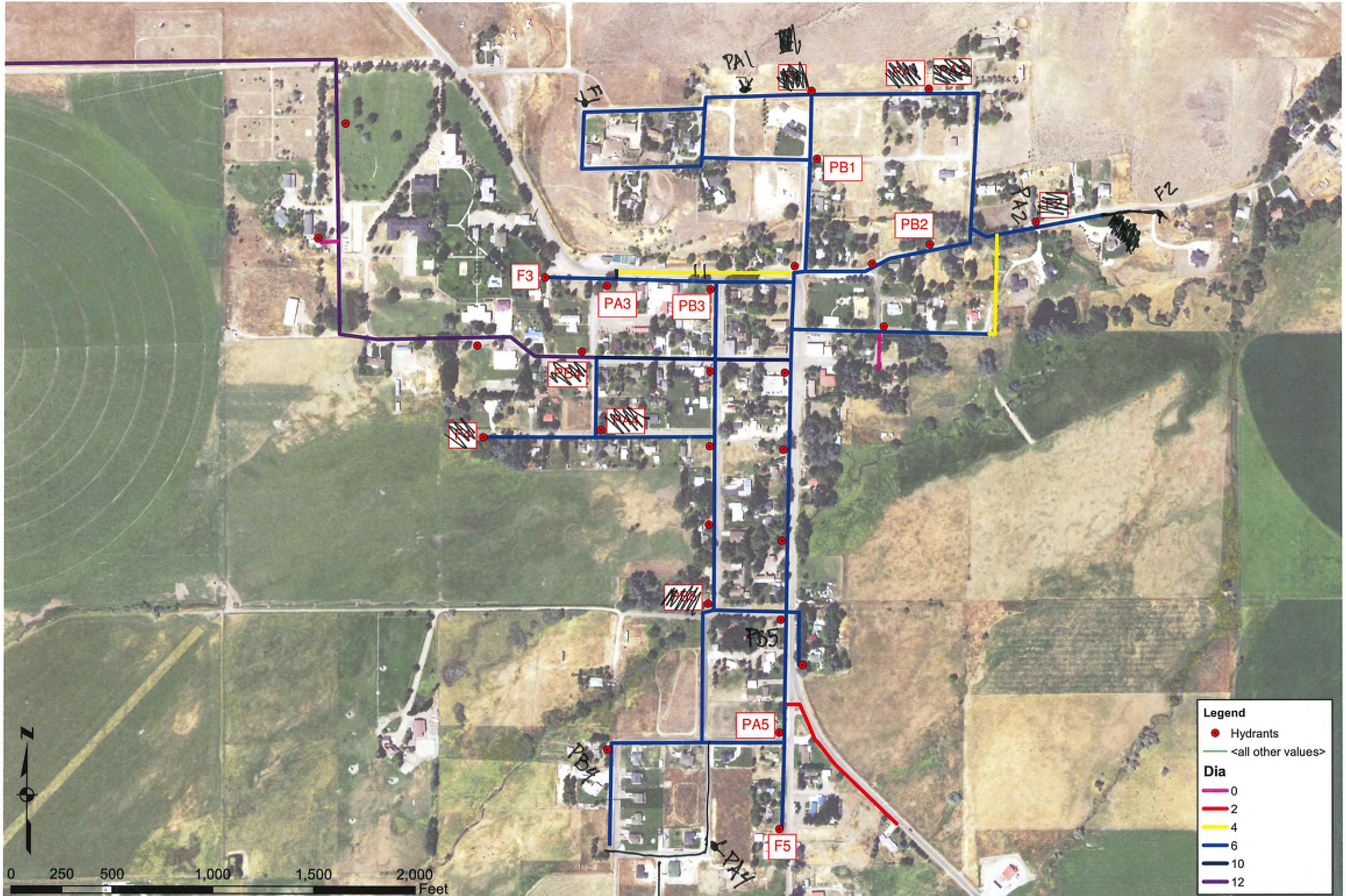
Test No.	Hydrant Location	Time of Residual Reading	Port 1 Pitot Pressure (psi)	Port 1 Pitot Flow (gpm)	Port 2 Pitot Pressure (psi)	Port 2 Pitot Flow (gpm)
1	Mtn. View & Gamble Dr	10:18	25	839		
2	East end of North St	10:50	36	1007		
3	By Miller Hall on Highway	11:10	27	872		
4	Shadow Mtn Cir	11:31	19	732		
5	South end of Main St.	11:53	20	751		
6						
7						
8						

Flow Values for Pitot Readings on 2.5" Port											
Pitot Pressure (psi)	Pitot Flow (gpm)	Pitot Pressure (psi)	Pitot Flow (gpm)	Pitot Pressure (psi)	Pitot Flow (gpm)	Pitot Pressure (psi)	Pitot Flow (gpm)	Pitot Pressure (psi)	Pitot Flow (gpm)	Pitot Pressure (psi)	Pitot Flow (gpm)
1	168	14	628	27	872	40	1062	53	1222	66	1364
2	237	15	650	28	888	41	1075	54	1233	67	1374
3	291	16	671	29	904	42	1088	55	1245	68	1384
4	336	17	692	30	919	43	1101	56	1256	69	1394
5	375	18	712	31	935	44	1113	57	1267	70	1404
6	411	19	732	32	950	45	1126	58	1278	71	1414
7	444	20	751	33	964	46	1138	59	1289	72	1424
8	475	21	769	34	979	47	1151	60	1300	73	1434
9	504	22	787	35	993	48	1163	61	1311	74	1444
10	531	23	805	36	1007	49	1175	62	1322	75	1454
11	557	24	822	37	1021	50	1187	63	1332	76	1464
12	581	25	839	38	1035	51	1199	64	1343	77	1474
13	605	26	856	39	1048	52	1210	65	1353	78	1484

Flow Values for Pitot Readings on 4.5" Steamer Port											
Pitot Pressure (psi)	Pitot Flow (gpm)	Pitot Pressure (psi)	Pitot Flow (gpm)	Pitot Pressure (psi)	Pitot Flow (gpm)	Pitot Pressure (psi)	Pitot Flow (gpm)	Pitot Pressure (psi)	Pitot Flow (gpm)	Pitot Pressure (psi)	Pitot Flow (gpm)
1	544	7	1439	13	1961	19	2371	25	2719	31	3028
2	769	8	1538	14	2035	20	2432	26	2773	32	3076
3	942	9	1632	15	2106	21	2492	27	2826	33	3124
4	1088	10	1720	16	2175	22	2551	28	2878	34	3171
5	1216	11	1804	17	2242	23	2608	29	2929	35	3217
6	1332	12	1884	18	2307	24	2664	30	2979	36	3263

Test No.	Time of Static Reading	Tank Level	Time of Residual Reading	Tank Level
1	1015	14.1	1018	13.1-13.7
2	1047	12.5	1050	12.2
3	1107	12.9	1110	11.8
4	1128	12.4	1131	11.6
5	1150	11.9	1153	11.1
6				
7				

Print Date: 5/27/2021



Document Path: J:\219121 Albion GES_GIS\MXDs\Water System.mxd

PROJECT NO. 219121

FILENAME

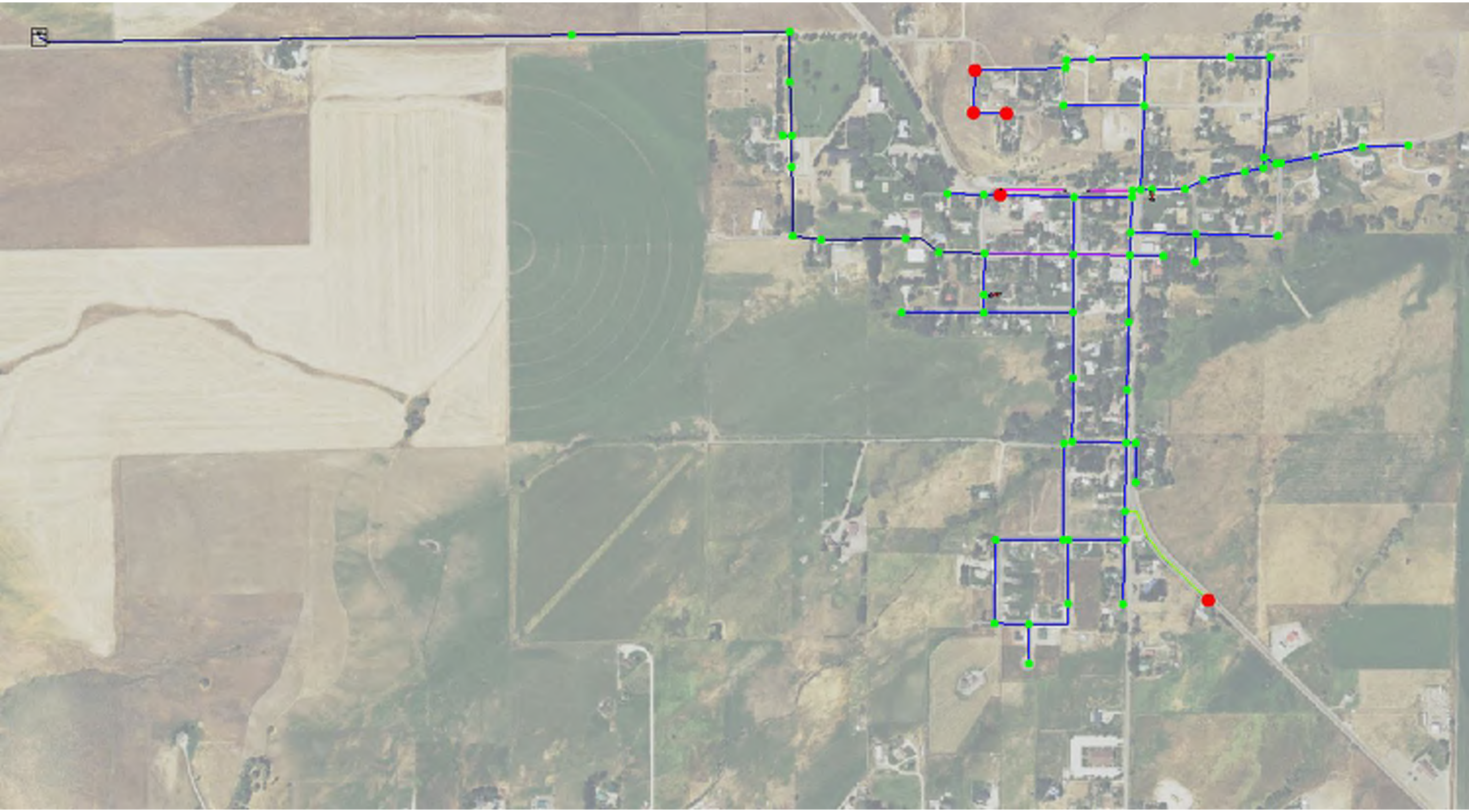
KELLER ASSOCIATES
305 N. 3rd Avenue
Pocatello, ID 83201
208.238.2146

CITY OF ALBION

Water Facilities Planning Study

Fire Flow Testing

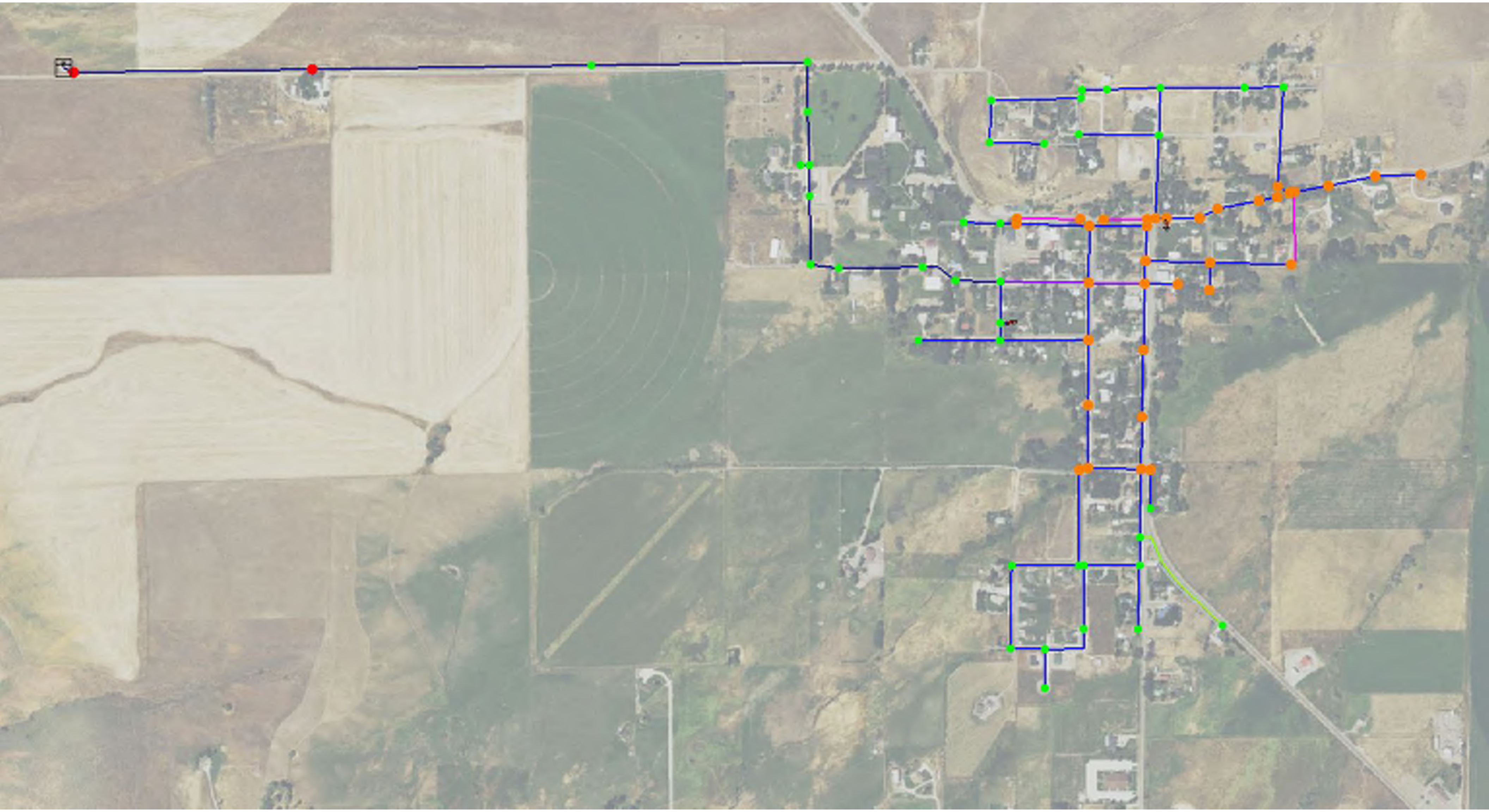
FIGURE NO. 1



2021 MDD + FF Results

FlexTable: Junction Table

Label	Zone	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (psi)
J-3	Zone - 1	1,750	1,617	27	86
J-5	Zone - 1	1,000	762	24	67
J-41	Zone - 1	1,000	861	34	77
J-42	Zone - 1	1,000	800	26	69
J-62	Zone - 1	1,000	88	24	85



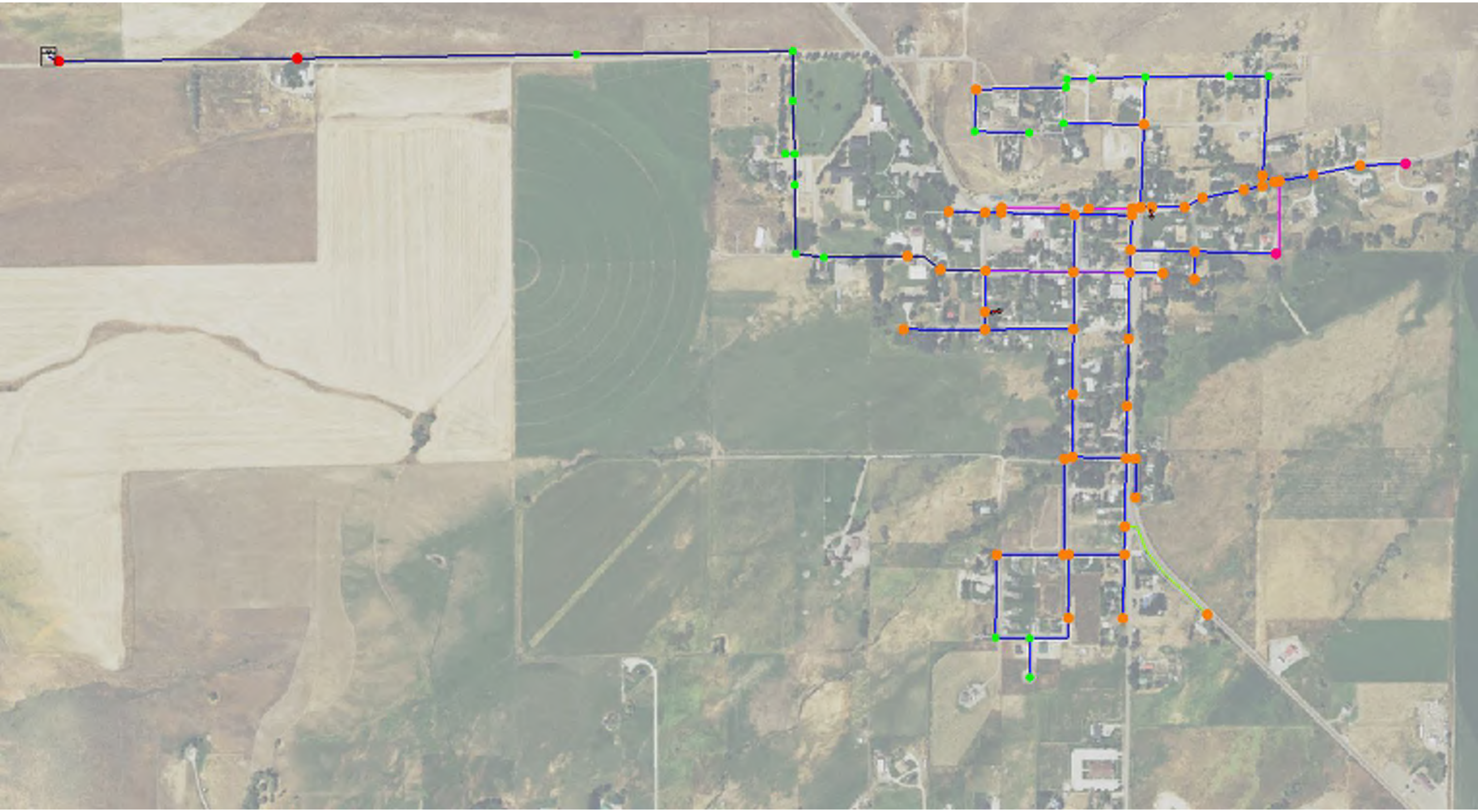
2021 PHD Results

FlexTable: Junction Table

Label	Zone	Pressure (psi)
J-2	Zone - 1	94
J-56	Zone - 1	92
J-74	Zone - 1	89
J-73	Zone - 1	88
J-19	Zone - 1	88
J-79	Zone - 1	88
J-20	Zone - 1	88
J-1	Zone - 1	88
J-32	Zone - 1	87
J-18	Zone - 1	87
J-53	Zone - 1	86
J-24	Zone - 1	85
J-75	Zone - 1	85
J-27	Zone - 1	85
J-31	Zone - 1	85
J-25	Zone - 1	85
J-45	Zone - 1	85
J-26	Zone - 1	84
J-76	Zone - 1	84
J-11	Zone - 1	84
J-8	Zone - 1	84
J-49	Zone - 1	84
J-7	Zone - 1	84
J-47	Zone - 1	84
J-51	Zone - 1	83
J-48	Zone - 1	83
J-78	Zone - 1	83
J-77	Zone - 1	82
J-17	Zone - 1	82
J-13	Zone - 1	81
J-16	Zone - 1	81
J-12	Zone - 1	81
J-4	Zone - 1	81
J-3	Zone - 1	80
J-23	Zone - 1	80
J-22	Zone - 1	80
J-40	Zone - 1	80
J-37	Zone - 1	80
J-83	Zone - 1	79
J-29	Zone - 1	78
J-62	Zone - 1	78
J-58	Zone - 1	77
J-46	Zone - 1	77
J-33	Zone - 1	77
J-30	Zone - 1	76
J-34	Zone - 1	75
J-80	Zone - 1	74
J-50	Zone - 1	74
J-52	Zone - 1	74

FlexTable: Junction Table

Label	Zone	Pressure (psi)
J-44	Zone - 1	73
J-36	Zone - 1	73
J-35	Zone - 1	72
J-67	Zone - 1	71
J-41	Zone - 1	71
J-54	Zone - 1	71
J-38	Zone - 1	69
J-39	Zone - 1	68
J-59	Zone - 1	68
J-55	Zone - 1	66
J-60	Zone - 1	66
J-9	Zone - 1	65
J-15	Zone - 1	65
J-14	Zone - 1	65
J-63	Zone - 1	65
J-71	Zone - 1	64
J-68	Zone - 1	64
J-72	Zone - 1	63
J-10	Zone - 1	63
J-6	Zone - 1	62
J-42	Zone - 1	62
J-5	Zone - 1	60
J-43	Zone - 1	59
J-70	Zone - 1	51
J-69	No Zone	27
J-82	No Zone	4



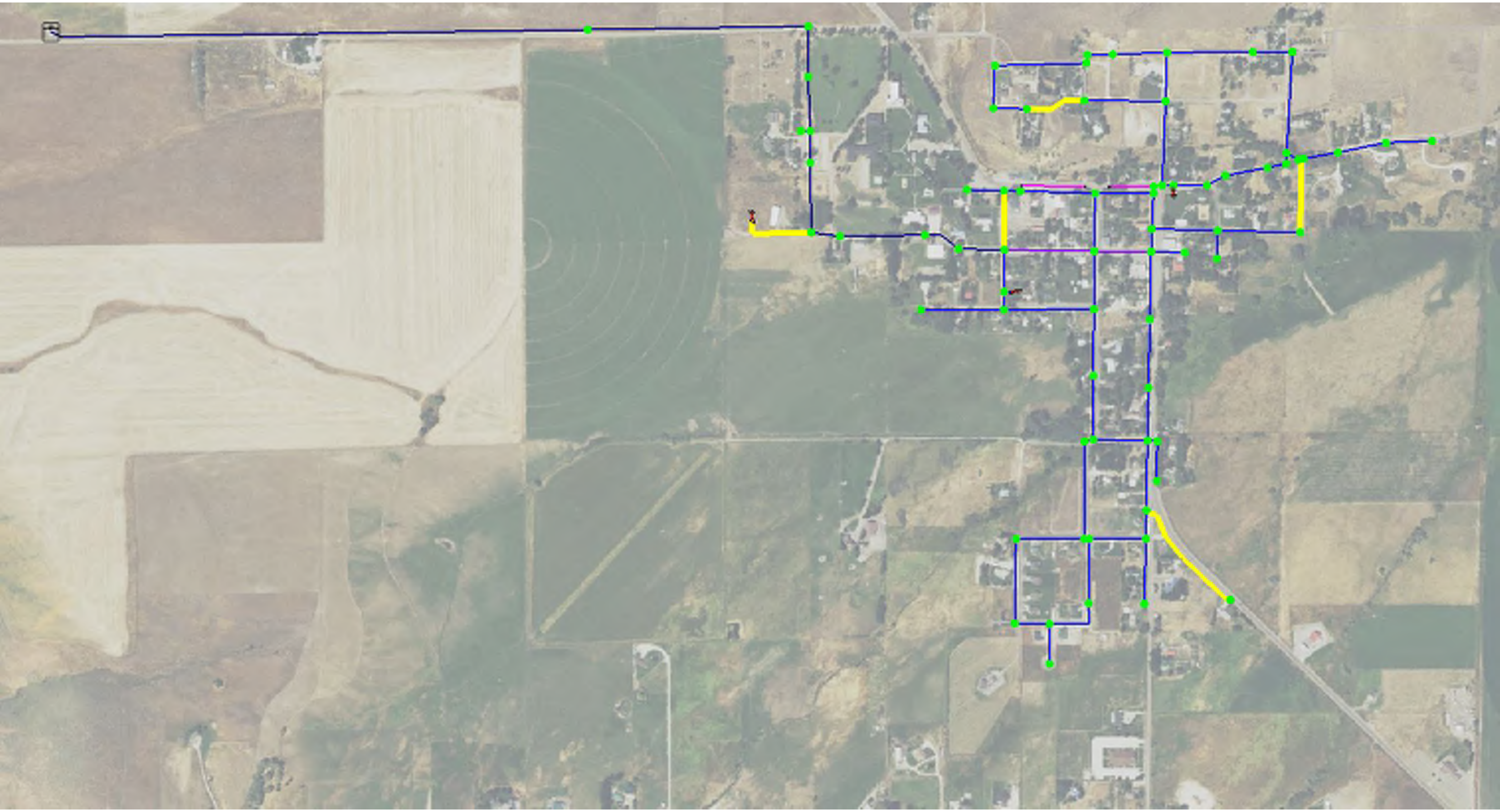
2021 ADD Results

FlexTable: Junction Table

Label	Demand (gpm)	Pressure (psi)
J-2	1	104
J-56	1	100
J-74	1	98
J-73	1	98
J-19	0	98
J-79	0	97
J-20	0	97
J-1	2	97
J-18	1	96
J-32	1	96
J-53	1	95
J-24	2	95
J-25	1	94
J-31	1	94
J-45	1	94
J-75	2	93
J-76	1	93
J-27	2	93
J-11	0	93
J-26	1	93
J-8	1	93
J-7	1	93
J-49	3	92
J-47	6	92
J-51	3	92
J-78	0	91
J-48	3	91
J-17	1	91
J-77	0	91
J-13	2	90
J-16	1	90
J-12	1	90
J-4	1	89
J-3	1	89
J-37	2	89
J-83	0	88
J-22	2	88
J-23	2	88
J-62	1	88
J-40	4	87
J-33	2	86
J-58	1	86
J-46	2	86
J-29	2	85
J-34	2	85
J-80	1	84
J-50	1	84
J-52	2	84
J-30	1	83

FlexTable: Junction Table

Label	Demand (gpm)	Pressure (psi)
J-44	2	83
J-67	1	80
J-41	1	80
J-54	3	80
J-36	1	80
J-38	2	79
J-35	1	79
J-39	0	78
J-59	0	78
J-60	2	75
J-9	0	75
J-71	1	73
J-55	0	73
J-72	1	73
J-10	1	72
J-6	2	72
J-42	1	72
J-15	1	71
J-14	1	71
J-63	0	71
J-5	1	70
J-68	0	70
J-43	1	68
J-70	0	56
J-69	0	30
J-82	0	3
J-84	(N/A)	(N/A)
J-85	(N/A)	(N/A)
J-86	(N/A)	(N/A)
J-87	(N/A)	(N/A)



APPENDIX F: O&M BUDGET

- 2019-2020 Water System Revenue & Expenses Summary

11:00 AM

04/26/21

Accrual Basis

City of Albion
Profit & Loss Budget vs. Actual
October 2018 through September 2019

	General				Electric		
	Oct '18 - Sep 19	Budget	$ Over Budget	% of Budget	Oct '18 - Sep 19	Budget	$ Over Budget
Income							
Park Revenue	1,001.00	3,000.00	-1,999.00	33.4%	0.00		
General Reserve Fund	0.00	200,000.00	-200,000.00	0.0%	0.00		
General Tax Levy Revenue	34,627.91	28,349.00	6,278.91	122.1%	0.00		
Water Revenue	0.00	0.00	0.00	0.0%	0.00		
Sewer Revenue	0.00				0.00		
Liquor licenses	0.00	375.00	-375.00	0.0%	0.00		
Highway State Allocation	9,899.87	12,919.00	-3,019.13	76.6%	0.00		
Revenue Sharing	11,718.34	12,055.00	-336.66	97.2%	0.00		
Liquor State Apportionment	10,943.00	10,635.00	308.00	102.9%	0.00		
Electric Revenue	0.00				280,117.89	300,000.00	-19,882.11
Government Grants	0.00	50,000.00	-50,000.00	0.0%	0.00		
P.I.L.T.	13,716.00				0.00	15,000.00	-15,000.00
Misc Revenues	4,963.63	21,000.00	-16,036.37	23.6%	12,106.74		
Interest Income	6,083.79	1,600.00	4,483.79	380.2%	116.08		
Total Income	92,953.54	339,933.00	-246,979.46	27.3%	292,340.71	315,000.00	-22,659.29
Gross Profit	92,953.54	339,933.00	-246,979.46	27.3%	292,340.71	315,000.00	-22,659.29
Expense							
Albion Law Enforcement	0.00	0.00	0.00	0.0%	0.00		
Grant Expenditures	0.00	50,000.00	-50,000.00	0.0%	0.00		
Park Expense	1,988.00	3,000.00	-1,012.00	66.3%	0.00		
Sheriff	2,500.00	2,750.00	-250.00	90.9%	0.00		
Auditor	1,400.00	1,400.00	0.00	100.0%	1,400.00	1,400.00	0.00
Attorney	7,084.75	12,000.00	-4,915.25	59.0%	3,542.35	6,000.00	-2,457.65
Mayor & Council Salaries	8,150.10	9,600.00	-1,449.90	84.9%	3,450.00	3,600.00	-150.00
Salaries	13,185.85	10,270.00	2,915.85	128.4%	65,524.24	54,790.00	10,734.24
Administrative Exp	12,280.00	5,880.00	6,400.00	208.8%	7,506.32	31,360.00	-23,853.68
Capital Improvements	1,260.00	200,000.00	-198,740.00	0.6%	10,771.25		
Depreciation Exp	0.00				8,685.60		
Electrical Power Purchase	0.00				159,172.00	200,000.00	-40,828.00
Insurance	13,622.42	33,000.00	-19,377.58	41.3%	6,556.50		
Interest Exp	0.00				0.00	0.00	0.00
Misc Exp	748.10	1,324.00	-575.90	56.5%	0.00		
Payroll Expenses	1,747.96	2,400.00	-652.04	72.8%	5,894.74	12,800.00	-6,905.26
Payment in Lieu of Taxes	0.00				13,716.00	15,000.00	-1,284.00
Raft River Operation-Maint	0.00				29,551.25	38,000.00	-8,448.75
Retirement-PERSI	1,656.81	2,640.00	-983.19	62.8%	8,836.26	14,080.00	-5,243.74
Shop Expense	877.69	900.00	-22.31	97.5%	28.47	100.00	-71.53

City of Albion
Profit & Loss Budget vs. Actual
October 2018 through September 2019

	General				Electric		
	Oct '18 - Sep 19	Budget	$ Over Budget	% of Budget	Oct '18 - Sep 19	Budget	$ Over Budget
Supplies, Maintenance & Repairs	15,714.14	8,280.00	7,434.14	189.8%	7,768.11	8,280.00	-511.89
Vehicle Expense	2,448.50	6,750.00	-4,301.50	36.3%	2,216.33	562.50	1,653.83
Total Expense	84,664.32	350,194.00	-265,529.68	24.2%	334,619.42	385,972.50	-51,353.08
Net Income	**8,289.22**	**-10,261.00**	**18,550.22**	**-80.8%**	**-42,278.71**	**-70,972.50**	**28,693.79**

City of Albion
Profit & Loss Budget vs. Actual
October 2018 through September 2019

	Electric	Highway				Water	
	% of Budget	Oct '18 - Sep 19	Budget	$ Over Budget	% of Budget	Oct '18 - Sep 19	Budget
Income							
Park Revenue		0.00				0.00	
General Reserve Fund		0.00				0.00	
General Tax Levy Revenue		8.25				0.00	
Water Revenue		0.00				53,004.53	142,000.00
Sewer Revenue		0.00				0.00	
Liquor licenses		0.00				0.00	
Highway State Allocation		3,234.53				0.00	
Revenue Sharing		0.00				0.00	
Liquor State Apportionment		0.00				0.00	
Electric Revenue	93.4%	0.00				0.00	
Government Grants		0.00				0.00	
P.I.L.T.	0.0%	0.00				0.00	
Misc Revenues		0.00				3,200.00	
Interest Income		0.00				187.62	
Total Income	92.8%	3,242.78				56,392.15	142,000.00
Gross Profit	92.8%	3,242.78				56,392.15	142,000.00
Expense							
Albion Law Enforcement		0.00				0.00	
Grant Expenditures		0.00				0.00	
Park Expense		0.00				0.00	
Sheriff		0.00				0.00	
Auditor	100.0%	0.00				1,400.00	1,400.00
Attorney	59.0%	0.00				1,771.20	3,000.00
Mayor & Council Salaries	95.8%	0.00				3,830.00	3,600.00
Salaries	119.6%	0.00				12,285.85	10,270.00
Administrative Exp	23.9%	50.00				6,726.66	5,880.00
Capital Improvements		0.00				3,873.71	
Depreciation Exp		0.00				27,720.98	
Electrical Power Purchase	79.6%	0.00				0.00	
Insurance		0.00				4,209.54	
Interest Exp	0.0%	0.00				1,649.92	180.00
Misc Exp		0.00				0.00	
Payroll Expenses	46.1%	0.00				1,348.94	2,400.00
Payment in Lieu of Taxes	91.4%	0.00				0.00	
Raft River Operation-Maint	77.8%	0.00				0.00	
Retirement-PERSI	62.8%	0.00				1,656.81	2,640.00
Shop Expense	28.5%	0.00				624.38	100.00

City of Albion
Profit & Loss Budget vs. Actual
October 2018 through September 2019

	Electric	Highway				Water	
	% of Budget	Oct '18 - Sep 19	Budget	$ Over Budget	% of Budget	Oct '18 - Sep 19	Budget
Supplies, Maintenance & Repairs	93.8%	0.00				23,719.75	44,160.00
Vehicle Expense	394.0%	0.00				2,140.52	1,125.00
Total Expense	86.7%	50.00				92,958.26	74,755.00
Net Income	59.6%	3,192.78				-36,566.11	67,245.00

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Accrual Basis

City of Albion
Profit & Loss Budget vs. Actual
October 2018 through September 2019

	Water		Sewer				TOTAL
	$ Over Budget	% of Budget	Oct '18 - Sep 19	Budget	$ Over Budget	% of Budget	Oct '18 - Sep 19
Income							
Park Revenue			0.00				1,001.00
General Reserve Fund			0.00				0.00
General Tax Levy Revenue			0.00				34,636.16
Water Revenue	-88,995.47	37.3%	0.00				53,004.53
Sewer Revenue			77,717.09	90,000.00	-12,282.91	86.4%	77,717.09
Liquor licenses			0.00				0.00
Highway State Allocation			0.00				13,134.40
Revenue Sharing			0.00				11,718.34
Liquor State Apportionment			0.00				10,943.00
Electric Revenue			0.00				280,117.89
Government Grants			2,974.50				2,974.50
P.I.L.T.			0.00				13,716.00
Misc Revenues			600.00				20,870.37
Interest Income			271.33				6,658.82
Total Income	-85,607.85	39.7%	81,562.92	90,000.00	-8,437.08	90.6%	526,492.10
Gross Profit	-85,607.85	39.7%	81,562.92	90,000.00	-8,437.08	90.6%	526,492.10
Expense							
Albion Law Enforcement			0.00				0.00
Grant Expenditures			0.00				0.00
Park Expense			0.00				1,988.00
Sheriff			0.00				2,500.00
Auditor	0.00	100.0%	1,400.00	1,400.00	0.00	100.0%	5,600.00
Attorney	-1,228.80	59.0%	1,771.20	3,000.00	-1,228.80	59.0%	14,169.50
Mayor & Council Salaries	230.00	106.4%	3,450.00	3,600.00	-150.00	95.8%	18,880.10
Salaries	2,015.85	119.6%	12,285.85	10,270.00	2,015.85	119.6%	103,281.79
Administrative Exp	846.66	114.4%	4,735.34	5,880.00	-1,144.66	80.5%	31,298.32
Capital Improvements			227.33				16,132.29
Depreciation Exp			32,868.59				69,275.17
Electrical Power Purchase			0.00				159,172.00
Insurance			4,209.54				28,598.00
Interest Exp	1,469.92	916.6%	0.00	120.00	-120.00	0.0%	1,649.92
Misc Exp			0.00				748.10
Payroll Expenses	-1,051.06	56.2%	1,319.88	2,400.00	-1,080.12	55.0%	10,311.52
Payment in Lieu of Taxes			0.00				13,716.00
Raft River Operation-Maint			0.00				29,551.25
Retirement-PERSI	-983.19	62.8%	1,656.81	2,640.00	-983.19	62.8%	13,806.69
Shop Expense	524.38	624.4%	28.47	100.00	-71.53	28.5%	1,559.01

City of Albion
Profit & Loss Budget vs. Actual
October 2018 through September 2019

	Water		Sewer				TOTAL
	$ Over Budget	% of Budget	Oct '18 - Sep 19	Budget	$ Over Budget	% of Budget	Oct '18 - Sep 19
Supplies, Maintenance & Repairs	-20,440.25	53.7%	9,177.39	8,280.00	897.39	110.8%	56,379.39
Vehicle Expense	1,015.52	190.3%	2,140.52	562.50	1,578.02	380.5%	8,945.87
Total Expense	18,203.26	124.4%	75,270.92	38,252.50	37,018.42	196.8%	587,562.92
Net Income	**-103,811.11**	**-54.4%**	**6,292.00**	**51,747.50**	**-45,455.50**	**12.2%**	**-61,070.82**

City of Albion
Profit & Loss Budget vs. Actual
October 2018 through September 2019

	TOTAL		
	Budget	$ Over Budget	% of Budget
Income			
Park Revenue	3,000.00	-1,999.00	33.4%
General Reserve Fund	200,000.00	-200,000.00	0.0%
General Tax Levy Revenue	28,349.00	6,287.16	122.2%
Water Revenue	142,000.00	-88,995.47	37.3%
Sewer Revenue	90,000.00	-12,282.91	86.4%
Liquor licenses	375.00	-375.00	0.0%
Highway State Allocation	12,919.00	215.40	101.7%
Revenue Sharing	12,055.00	-336.66	97.2%
Liquor State Apportionment	10,635.00	308.00	102.9%
Electric Revenue	300,000.00	-19,882.11	93.4%
Government Grants	50,000.00	-47,025.50	5.9%
P.I.L.T.	15,000.00	-1,284.00	91.4%
Misc Revenues	21,000.00	-129.63	99.4%
Interest Income	1,600.00	5,058.82	416.2%
Total Income	886,933.00	-360,440.90	59.4%
Gross Profit	886,933.00	-360,440.90	59.4%
Expense			
Albion Law Enforcement	0.00	0.00	0.0%
Grant Expenditures	50,000.00	-50,000.00	0.0%
Park Expense	3,000.00	-1,012.00	66.3%
Sheriff	2,750.00	-250.00	90.9%
Auditor	5,600.00	0.00	100.0%
Attorney	24,000.00	-9,830.50	59.0%
Mayor & Council Salaries	20,400.00	-1,519.90	92.5%
Salaries	85,600.00	17,681.79	120.7%
Administrative Exp	49,000.00	-17,701.68	63.9%
Capital Improvements	200,000.00	-183,867.71	8.1%
Depreciation Exp	0.00	69,275.17	100.0%
Electrical Power Purchase	200,000.00	-40,828.00	79.6%
Insurance	33,000.00	-4,402.00	86.7%
Interest Exp	300.00	1,349.92	550.0%
Misc Exp	1,324.00	-575.90	56.5%
Payroll Expenses	20,000.00	-9,688.48	51.6%
Payment in Lieu of Taxes	15,000.00	-1,284.00	91.4%
Raft River Operation-Maint	38,000.00	-8,448.75	77.8%
Retirement-PERSI	22,000.00	-8,193.31	62.8%
Shop Expense	1,200.00	359.01	129.9%

City of Albion
Profit & Loss Budget vs. Actual
October 2018 through September 2019

	TOTAL		
	Budget	$ Over Budget	% of Budget
Supplies, Maintenance & Repairs	69,000.00	-12,620.61	81.7%
Vehicle Expense	9,000.00	-54.13	99.4%
Total Expense	849,174.00	-261,611.08	69.2%
Net Income	**37,759.00**	**-98,829.82**	**-161.7%**

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04/26/21

Accrual Basis

City of Albion
Profit & Loss Budget vs. Actual
October 2019 through September 2020

	General				Electric		
	Oct '19 - Sep 20	Budget	$ Over Budget	% of Budget	Oct '19 - Sep 20	Budget	$ Over Budget
Income							
Park Revenue	1,755.00	4,000.00	-2,245.00	43.9%	0.00		
General Reserve Fund	0.00	200,000.00	-200,000.00	0.0%	0.00		
General Tax Levy Revenue	39,064.40	29,199.00	9,865.40	133.8%	0.00		
Water Revenue	0.00	0.00	0.00	0.0%	0.00		
Sewer Revenue	0.00				0.00		
Liquor licenses	0.00	375.00	-375.00	0.0%	0.00		
Highway State Allocation	9,976.30	12,805.00	-2,828.70	77.9%	0.00		
Revenue Sharing	18,801.30	11,794.00	7,007.30	159.4%	0.00		
Liquor State Apportionment	11,685.00	10,405.00	1,280.00	112.3%	0.00		
Electric Revenue	0.00				283,841.36	300,000.00	-16,158.64
Government Grants	0.00	40,000.00	-40,000.00	0.0%	0.00		
P.I.L.T.	0.00	0.00	0.00	0.0%	0.00	15,500.00	-15,500.00
Misc Revenues	13,918.02	29,000.00	-15,081.98	48.0%	12,228.84	0.00	12,228.84
Interest Income	193.78	11,800.00	-11,606.22	1.6%	95.26	0.00	95.26
Contingency Reserve	0.00	0.00	0.00	0.0%	0.00		
Total Income	95,393.80	349,378.00	-253,984.20	27.3%	296,165.46	315,500.00	-19,334.54
Gross Profit	95,393.80	349,378.00	-253,984.20	27.3%	296,165.46	315,500.00	-19,334.54
Expense							
Grant Expenditures	0.00	40,000.00	-40,000.00	0.0%	0.00		
Park Expense	2,860.64	4,000.00	-1,139.36	71.5%	497.44		
Sheriff	2,500.00	2,750.00	-250.00	90.9%	0.00		
Auditor	1,400.00	672.00	728.00	208.3%	1,400.00	3,584.00	-2,184.00
Attorney	7,458.75	2,880.00	4,578.75	259.0%	3,729.39	15,360.00	-11,630.61
Mayor & Council Salaries	9,600.00	2,448.00	7,152.00	392.2%	3,600.00	13,056.00	-9,456.00
Salaries	13,703.76	10,752.00	2,951.76	127.5%	73,086.60	57,344.00	15,742.60
Administrative Exp	12,565.69	5,880.00	6,685.69	213.7%	12,183.76	31,360.00	-19,176.24
Capital Improvements	100,000.00	200,000.00	-100,000.00	50.0%	24,673.95	0.00	24,673.95
Depreciation Exp	0.00				0.00	0.00	0.00
Electrical Power Purchase	0.00				166,393.00	203,000.00	-36,607.00
Insurance	21,008.25	34,000.00	-12,991.75	61.8%	723.25	0.00	723.25
Interest Exp	0.00	0.00	0.00	0.0%	0.00	129.00	-129.00
Misc Exp	409.10	1,228.00	-818.90	33.3%	0.00		
Payroll Expenses	1,849.73	2,400.00	-550.27	77.1%	6,224.70	12,800.00	-6,575.30
Payment in Lieu of Taxes	0.00				0.00	15,500.00	-15,500.00
Raft River Operation-Maint	0.00				15,675.50	38,000.00	-22,324.50
Retirement-PERSI	1,930.22	2,760.00	-829.78	69.9%	10,345.22	14,720.00	-4,374.78
Shop Expense	1,008.86	832.00	176.86	121.3%	0.00	156.00	-156.00

City of Albion
Profit & Loss Budget vs. Actual
October 2019 through September 2020

	General				Electric		
	Oct '19 - Sep 20	Budget	$ Over Budget	% of Budget	Oct '19 - Sep 20	Budget	$ Over Budget
Supplies, Maintenance & Repairs	17,234.41	8,280.00	8,954.41	208.1%	4,336.25	8,280.00	-3,943.75
Vehicle Expense	2,816.52	4,480.00	-1,663.48	62.9%	2,788.14	840.00	1,948.14
Total Expense	196,345.93	323,362.00	-127,016.07	60.7%	325,657.20	414,129.00	-88,471.80
Net Income	**-100,952.13**	**26,016.00**	**-126,968.13**	**-388.0%**	**-29,491.74**	**-98,629.00**	**69,137.26**

City of Albion
Profit & Loss Budget vs. Actual
October 2019 through September 2020

	Electric	Highway				Water	
	% of Budget	Oct '19 - Sep 20	Budget	$ Over Budget	% of Budget	Oct '19 - Sep 20	Budget
Income							
Park Revenue		0.00				0.00	
General Reserve Fund		0.00				0.00	
General Tax Levy Revenue		0.00	0.00	0.00	0.0%	0.00	
Water Revenue		0.00				64,611.56	130,000.00
Sewer Revenue		0.00				0.00	
Liquor licenses		0.00				0.00	
Highway State Allocation		0.00	0.00	0.00	0.0%	0.00	
Revenue Sharing		0.00				0.00	
Liquor State Apportionment		0.00				0.00	
Electric Revenue	94.6%	0.00				0.00	
Government Grants		0.00				0.00	
P.I.L.T.	0.0%	0.00				0.00	
Misc Revenues	100.0%	0.00				7.04	0.00
Interest Income	100.0%	0.00				88.88	0.00
Contingency Reserve		0.00				0.00	
Total Income	93.9%	0.00	0.00	0.00	0.0%	64,707.48	130,000.00
Gross Profit	93.9%	0.00	0.00	0.00	0.0%	64,707.48	130,000.00
Expense							
Grant Expenditures		0.00				0.00	
Park Expense		0.00				9.49	
Sheriff		0.00				0.00	
Auditor	39.1%	0.00				1,400.00	672.00
Attorney	24.3%	0.00				1,864.68	2,880.00
Mayor & Council Salaries	27.6%	0.00				3,600.00	2,448.00
Salaries	127.5%	0.00				13,703.76	10,752.00
Administrative Exp	38.9%	0.00	0.00	0.00	0.0%	8,757.15	5,880.00
Capital Improvements	100.0%	0.00				5,491.77	0.00
Depreciation Exp	0.0%	0.00				0.00	0.00
Electrical Power Purchase	82.0%	0.00				0.00	
Insurance	100.0%	0.00				723.25	0.00
Interest Exp	0.0%	0.00				0.00	135.00
Misc Exp		0.00				0.00	
Payroll Expenses	48.6%	0.00				1,391.04	2,400.00
Payment in Lieu of Taxes	0.0%	0.00				0.00	
Raft River Operation-Maint	41.3%	0.00				0.00	
Retirement-PERSI	70.3%	0.00				1,930.22	2,760.00
Shop Expense	0.0%	0.00				0.00	156.00

City of Albion
Profit & Loss Budget vs. Actual
October 2019 through September 2020

	Electric	Highway				Water	
	% of Budget	Oct '19 - Sep 20	Budget	$ Over Budget	% of Budget	Oct '19 - Sep 20	Budget
Supplies, Maintenance & Repairs	52.4%	0.00				21,843.71	44,160.00
Vehicle Expense	331.9%	0.00				2,843.04	840.00
Total Expense	78.6%	0.00	0.00	0.00	0.0%	63,558.11	73,083.00
Net Income	**29.9%**	**0.00**	**0.00**	**0.00**	**0.0%**	**1,149.37**	**56,917.00**

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04/26/21

Accrual Basis

City of Albion
Profit & Loss Budget vs. Actual
October 2019 through September 2020

	Water		Sewer				Total unclassif...
	$ Over Budget	% of Budget	Oct '19 - Sep 20	Budget	$ Over Budget	% of Budget	Oct '19 - Sep 20
Income							
Park Revenue			0.00				0.00
General Reserve Fund			0.00				0.00
General Tax Levy Revenue			0.00				254.10
Water Revenue	-65,388.44	49.7%	0.00				-5,048.15
Sewer Revenue			79,038.01	98,000.00	-18,961.99	80.7%	-184.66
Liquor licenses			0.00				0.00
Highway State Allocation			0.00				2,881.79
Revenue Sharing			0.00				-1,879.79
Liquor State Apportionment			0.00				161.00
Electric Revenue			0.00				-1,417.52
Government Grants			0.00	0.00	0.00	0.0%	0.00
P.I.L.T.			0.00				15,302.00
Misc Revenues	7.04	100.0%	0.00	0.00	0.00	0.0%	20,028.21
Interest Income	88.88	100.0%	25.07	0.00	25.07	100.0%	9,744.50
Contingency Reserve			0.00				0.00
Total Income	-65,292.52	49.8%	79,063.08	98,000.00	-18,936.92	80.7%	39,841.48
Gross Profit	-65,292.52	49.8%	79,063.08	98,000.00	-18,936.92	80.7%	39,841.48
Expense							
Grant Expenditures			0.00				0.00
Park Expense			0.00				0.00
Sheriff			0.00				0.00
Auditor	728.00	208.3%	1,400.00	672.00	728.00	208.3%	0.00
Attorney	-1,015.32	64.7%	1,864.68	2,880.00	-1,015.32	64.7%	0.00
Mayor & Council Salaries	1,152.00	147.1%	3,600.00	2,448.00	1,152.00	147.1%	0.00
Salaries	2,951.76	127.5%	13,703.76	10,752.00	2,951.76	127.5%	0.00
Administrative Exp	2,877.15	148.9%	5,810.32	5,880.00	-69.68	98.8%	0.00
Capital Improvements	5,491.77	100.0%	667.34	0.00	667.34	100.0%	-17,766.00
Depreciation Exp	0.00	0.0%	0.00	0.00	0.00	0.0%	70,860.66
Electrical Power Purchase			0.00				0.00
Insurance	723.25	100.0%	723.25	0.00	723.25	100.0%	-136.00
Interest Exp	-135.00	0.0%	0.00	36.00	-36.00	0.0%	0.00
Misc Exp			0.00				5,983.01
Payroll Expenses	-1,008.96	58.0%	1,391.04	2,400.00	-1,008.96	58.0%	0.00
Payment in Lieu of Taxes			0.00				15,302.00
Raft River Operation-Maint			0.00				0.00
Retirement-PERSI	-829.78	69.9%	1,879.70	2,760.00	-880.30	68.1%	0.00
Shop Expense	-156.00	0.0%	0.00	156.00	-156.00	0.0%	0.00

City of Albion
Profit & Loss Budget vs. Actual
October 2019 through September 2020

	Water		Sewer				Total unclassif...
	$ Over Budget	% of Budget	Oct '19 - Sep 20	Budget	$ Over Budget	% of Budget	Oct '19 - Sep 20
Supplies, Maintenance & Repairs	-22,316.29	49.5%	8,799.26	8,280.00	519.26	106.3%	0.00
Vehicle Expense	2,003.04	338.5%	2,843.04	840.00	2,003.04	338.5%	-4,464.00
Total Expense	-9,524.89	87.0%	42,682.39	37,104.00	5,578.39	115.0%	69,779.67
Net Income	**-55,767.63**	**2.0%**	**36,380.69**	**60,896.00**	**-24,515.31**	**59.7%**	**-29,938.19**

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04/26/21
Accrual Basis

City of Albion
Profit & Loss Budget vs. Actual
October 2019 through September 2020

	Total unclassified			TOTAL			
	Budget	$ Over Budget	% of Budget	Oct '19 - Sep 20	Budget	$ Over Budget	% of Budget
Income							
Park Revenue	0.00	0.00	0.0%	1,755.00	4,000.00	-2,245.00	43.9%
General Reserve Fund	0.00	0.00	0.0%	0.00	200,000.00	-200,000.00	0.0%
General Tax Levy Revenue	0.00	254.10	100.0%	39,318.50	29,199.00	10,119.50	134.7%
Water Revenue	0.00	-5,048.15	100.0%	59,563.41	130,000.00	-70,436.59	45.8%
Sewer Revenue	0.00	-184.66	100.0%	78,853.35	98,000.00	-19,146.65	80.5%
Liquor licenses	0.00	0.00	0.0%	0.00	375.00	-375.00	0.0%
Highway State Allocation	0.00	2,881.79	100.0%	12,858.09	12,805.00	53.09	100.4%
Revenue Sharing	0.00	-1,879.79	100.0%	16,921.51	11,794.00	5,127.51	143.5%
Liquor State Apportionment	0.00	161.00	100.0%	11,846.00	10,405.00	1,441.00	113.8%
Electric Revenue	0.00	-1,417.52	100.0%	282,423.84	300,000.00	-17,576.16	94.1%
Government Grants	0.00	0.00	0.0%	0.00	40,000.00	-40,000.00	0.0%
P.I.L.T.	0.00	15,302.00	100.0%	15,302.00	15,500.00	-198.00	98.7%
Misc Revenues	0.00	20,028.21	100.0%	46,182.11	29,000.00	17,182.11	159.2%
Interest Income	0.00	9,744.50	100.0%	10,147.49	11,800.00	-1,652.51	86.0%
Contingency Reserve	0.00	0.00	0.0%	0.00	0.00	0.00	0.0%
Total Income	0.00	39,841.48	100.0%	575,171.30	892,878.00	-317,706.70	64.4%
Gross Profit	0.00	39,841.48	100.0%	575,171.30	892,878.00	-317,706.70	64.4%
Expense							
Grant Expenditures	0.00	0.00	0.0%	0.00	40,000.00	-40,000.00	0.0%
Park Expense	0.00	0.00	0.0%	3,367.57	4,000.00	-632.43	84.2%
Sheriff	0.00	0.00	0.0%	2,500.00	2,750.00	-250.00	90.9%
Auditor	0.00	0.00	0.0%	5,600.00	5,600.00	0.00	100.0%
Attorney	0.00	0.00	0.0%	14,917.50	24,000.00	-9,082.50	62.2%
Mayor & Council Salaries	0.00	0.00	0.0%	20,400.00	20,400.00	0.00	100.0%
Salaries	0.00	0.00	0.0%	114,197.88	89,600.00	24,597.88	127.5%
Administrative Exp	0.00	0.00	0.0%	39,316.92	49,000.00	-9,683.08	80.2%
Capital Improvements	0.00	-17,766.00	100.0%	113,067.06	200,000.00	-86,932.94	56.5%
Depreciation Exp	0.00	70,860.66	100.0%	70,860.66	0.00	70,860.66	100.0%
Electrical Power Purchase	0.00	0.00	0.0%	166,393.00	203,000.00	-36,607.00	82.0%
Insurance	0.00	-136.00	100.0%	23,042.00	34,000.00	-10,958.00	67.8%
Interest Exp	0.00	0.00	0.0%	0.00	300.00	-300.00	0.0%
Misc Exp	0.00	5,983.01	100.0%	6,392.11	1,228.00	5,164.11	520.5%
Payroll Expenses	0.00	0.00	0.0%	10,856.51	20,000.00	-9,143.49	54.3%
Payment in Lieu of Taxes	0.00	15,302.00	100.0%	15,302.00	15,500.00	-198.00	98.7%
Raft River Operation-Maint	0.00	0.00	0.0%	15,675.50	38,000.00	-22,324.50	41.3%
Retirement-PERSI	0.00	0.00	0.0%	16,085.36	23,000.00	-6,914.64	69.9%
Shop Expense	0.00	0.00	0.0%	1,008.86	1,300.00	-291.14	77.6%

City of Albion
Profit & Loss Budget vs. Actual
October 2019 through September 2020

	Total unclassified			TOTAL			
	Budget	$ Over Budget	% of Budget	Oct '19 - Sep 20	Budget	$ Over Budget	% of Budget
Supplies, Maintenance & Repairs	0.00	0.00	0.0%	52,213.63	69,000.00	-16,786.37	75.7%
Vehicle Expense	0.00	-4,464.00	100.0%	6,826.74	7,000.00	-173.26	97.5%
Total Expense	0.00	69,779.67	100.0%	698,023.30	847,678.00	-149,654.70	82.3%
Net Income	0.00	-29,938.19	100.0%	-122,852.00	45,200.00	-168,052.00	-271.8%

UTILITY REVENUES / EXPENSES

FISCAL YEAR 10/01/2018 - 09/30/2019

REVENUE

User Rate Revenue	$52,204.53	Hook-Up Revenue	$800.00

EXPENSES

Repairs & Replacement	$19,515.69	Equipment	$774.61
Chemicals	$1,393.75	Labs	$954.00
Back-Up Operator Fee	$900.00	Labor	$12,393.81

FISCAL YEAR 10/01/2019 - 09/30/2020

REVENUE

User Rate Revenue	$57,969.56	Hook-Up Revenue	$6,642.00

EXPENSES

Repairs & Replacement	$16,507.17	Equipment	$2,274.45
Chemicals	$2,620.64	Labs	$1,660.00
Back-Up Operator Fee	$1,215.05	Labor	$13,703.75

USER RATE $33.00/150,000 + $1.00/1,000 thereafter

CUSTOMER DATA - MONTHLY WATER CONSUMPTION

FISCAL YEAR 10/01/2018 - 09/30/2019

MONTH	USAGE
October	3,170,000
November	872,000
December	664,000
January	667,000
February	673,000
March	781,000
April	776,000
May	2,116,000
June	4,113,000
July	7,516,000
August	7,767,000
September	5,648,000
Grand Total	34,763,000

FISCAL YEAR 10/01/2019 - 09/30/2020

MONTH	USAGE
October	2,253,000
November	905,000
December	736,000
January	708,000
February	765,000
March	590,000
April	816,000
May	4,401,000
June	5,227,000
July	8,183,000
August	10,458,000
September	7,620,000
Grand Total	42,662,000

FISCAL YEAR 10/01/2018 - 09/30/2019

ALL ACCOUNTS ARE METERED / 1 EDU PER ACCOUNT

ACCOUNTS	TYPE
148	Residential
36	Commercial

FISCAL YEAR 10/01/2019 - 09/30/2020

ACCOUNTS	TYPE
153	Residentail
36	Commercial

APPENDIX G: PUBLIC PARTICIPATION

- Public Comment Period Notification
- Public Meeting Presentation
- Comment Form
- Aug 19, 2020 City Council Meeting Minutes

Notice of 14-Day Public Comment Period and Public Open House for the City of Albion Water Facilities Planning Study

The City of Albion, Idaho is currently in the process of developing a 20-year planning document to address the needs of the community public water system. As part of this process, the public is invited to review a draft version of the study for a period of 14 days beginning on February 28, 2022 and ending March 14, 2022. A copy of the draft report can be obtained at the Albion City Office, 225 South Main, P.O. Box 147, Albion, Idaho 83311.

On March 1, 2022 at 6:00 PM the City will hold a Public Open House at the Albion Civic Center, 124 South Main Street, Albion, Idaho 83311, wherein the public can find out more about the study results and recommended alternative, as well as submit comments.

Citizens may send written comments to any one of the following:

Tyler Pratt – tpratt@kellerassociates.com
Mary Yeoman or Deric Bell – albioncty@atcnet.net

Individuals with disabilities, who require special accommodations to participate in the public comment period, must make a request with the City by contacting them at (208) 673-5352.

1

Water Facilities Planning Study

KELLER ASSOCIATES

EVALUATED
- Population Growth
- Water Demand
- Water Sources
- Storage Tank
- Distribution System

Make recommendations to keep system in compliance with DEQ regulations for drinking water systems

Develop a capital improvement plan to address issues

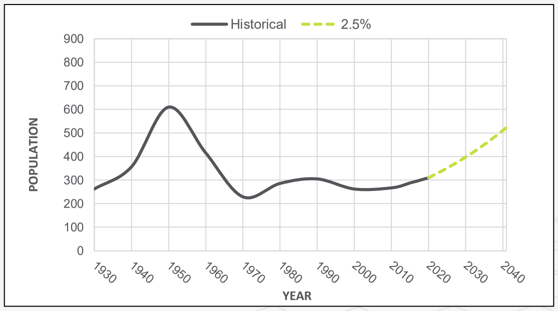
2

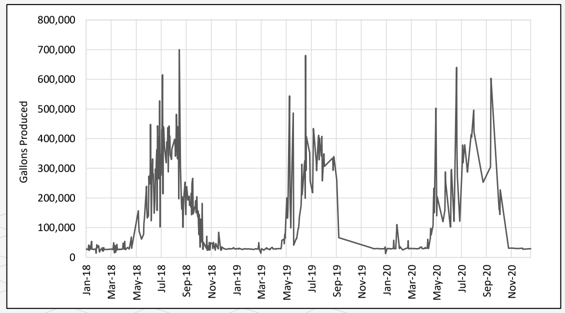
2

Population Growth & Demand

Population
- 2021 Population = 310 people
- 2041 Population = 524 people

Demand
- 2021 Average Day Demand = 88 gpm
- 2041 Average Day Demand = 144 gpm





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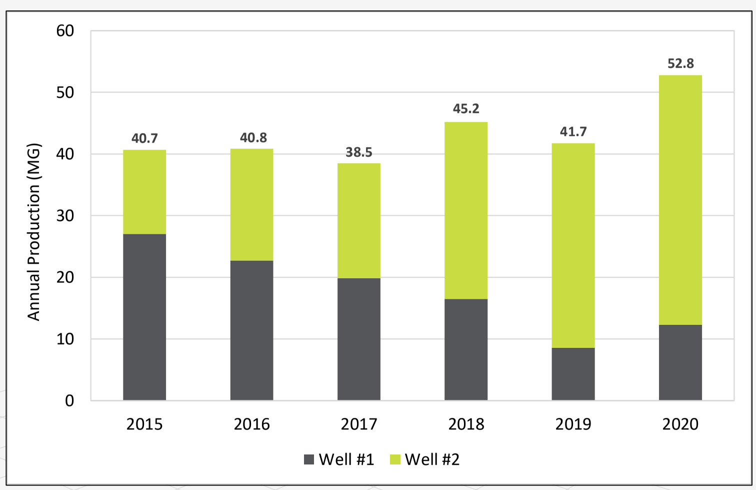
Drinking Water Sources

Groundwater Wells
- Well #1 – 170 gpm
- Well #2 – 350 gpm
- Well #3 – disconnected
- Well #4 – abandoned

Well #1 Pumphouse located in City Park



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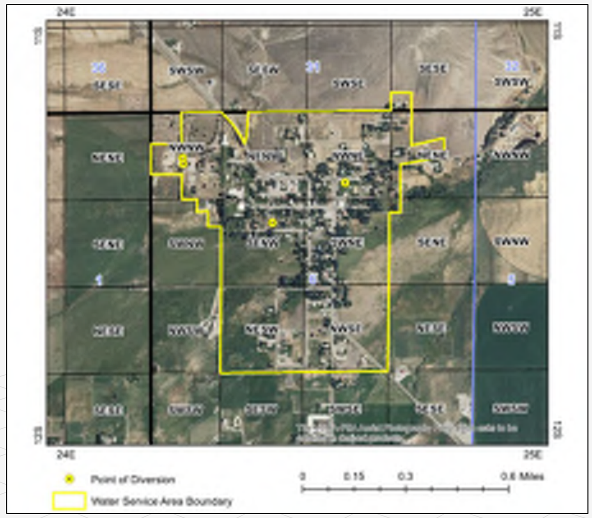
Water Rights

KELLER ASSOCIATES

Municipal Water Rights
- Priority Date 1911-1966
- Max Flow Rate = 848 gpm

Irrigation Water Rights
- Priority Date 1873
- Max Flow Rate = 408 gpm



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Water Storage Tank

KELLER ASSOCIATES

- The partially buried concrete storage tank was built in 1992
- The tank is in decent condition
- Storage volume is insufficient for fire flow requirements
- Under DEQ's redundant fire flow requirement, the tank is lacking 211,500 gallons for current demands
- An emergency generator could help offset a portion of the required additional storage

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Distribution System

KELLER ASSOCIATES

- Over 30,800 ft of pipelines (5.8 miles) from 2 – 12 inch diameter
- Most of the piping was replaced with PVC in 1992 and appears to be in decent condition
- Fire flow deficiencies and hydrant coverage was evaluated and deficient areas identified
- Water meters are approaching 10-15 yrs old and will likely need to be replaced in the near future

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Deficiencies – Pumping Capacity & Storage

Design Basis (IDAPA 58.01.08.501.03)

- If max day demand continues for more than one day, system will run out of water

Source Redundancy (IDAPA 58.01.08.501.17)

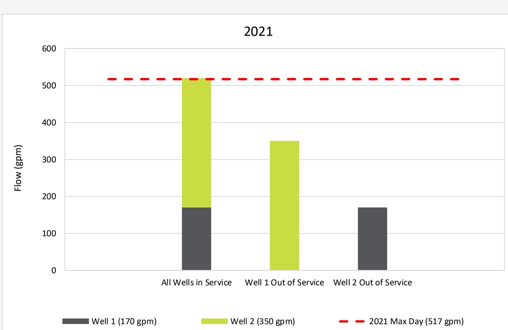
- System should be able to meet demands with the largest pump out of service

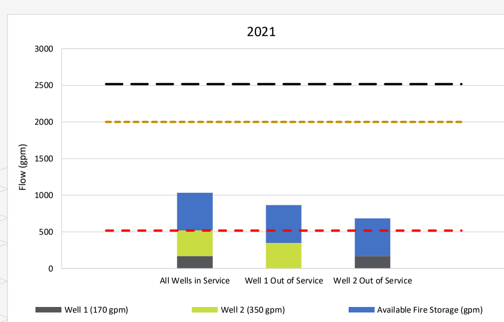
Fire Flows (IDAPA 58.01.08.501.18)

- System should be able to provide fire flows during max day demands

Redundant Fire Flow Capacity (IDAPA 58.01.08.501.18)

- System should be able to provide fire flows with largest pump out of service





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Pumping Capacity & Storage – Improvement Alternatives

Alternative 1A
- Increase Capacity of Well #1
- 3 New Wells

Alternative 1B
- Increase Capacity of Well #1
- 2 New Wells
- New 100,000 Gal (min) Storage Tank
  - Recommended 250,000 Gal Storage Tank

Alternative 1C
- Increase Capacity of Well #1
- 2 New Wells
- New 100,000 Gal (min) Storage Tank
  - Recommended 250,000 Gal Storage Tank
- Secondary Water System

Per IDAPA Requirements, design is for 20-year population projection
New tank is sized to match size of existing tank
All alternatives require purchasing 400 gpm of municipal water rights

Pumping Capacity & Storage – Cost Estimates

KELLER ASSOCIATES

Cost Description	Alternative 1A	Alternative 1B	Alternative 1C
Estimated Capital Cost	$2,838,000	$3,253,000	$4,686,000
Estimated Increase in Annual O&M*	$1,440	$1,868	$2,868
Estimated Increase in Annual SLA*	$9,480	$7,617	$12,916
20-year Lifecycle Cost	$2,973,542	$3,373,834	$4,881,427

**Cost estimates are preliminary and are based on the current understanding of the project. Cost estimates will continue to be refined during the project planning and design process. Actual costs will be determined at time of bidding. The cost estimate herein is concept level information only based on our perception of current conditions at the project location and its accuracy is subject to significant variation depending upon project definition and other factors. This estimate reflects our opinion of probable costs at this time and is subject to change as the project design matures. Keller Associates has no control over variances in the cost of labor, materials, equipment, services provided by others, contractor's methods of determining prices, competitive bidding or market conditions, practices or bidding strategies. Keller Associates cannot and does not warrant or guarantee that proposals, bids, or actual construction costs will not vary from the cost presented herein.*

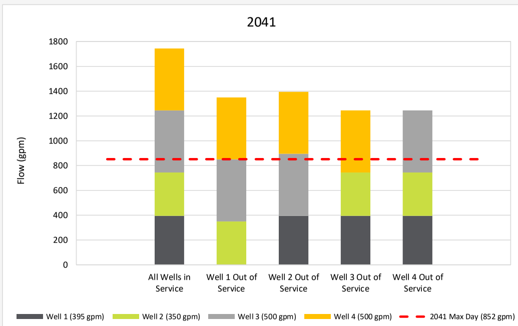
Pumping Capacity & Storage – Recommended Improvement

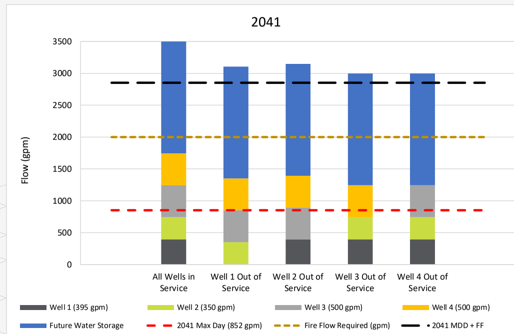
Alternative 1B

- Increase Capacity of Well #1
- 2 New Wells
- New 100,000 Gal (min) Storage Tank

Reasoning

- Better than Alt 1A because the additional water tank provides storage reserve when a pump breaks down or there is a prolonged power outage
- Cheaper than Alt 1C





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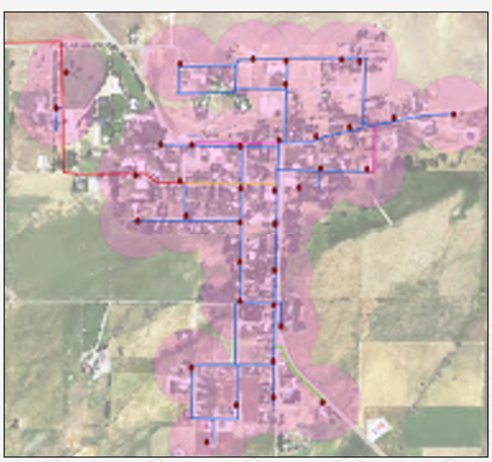
Piping Deficiencies

KELLER ASSOCIATES

- Incomplete Fire Hydrant Coverage



- Insufficient Fire Flows at select locations

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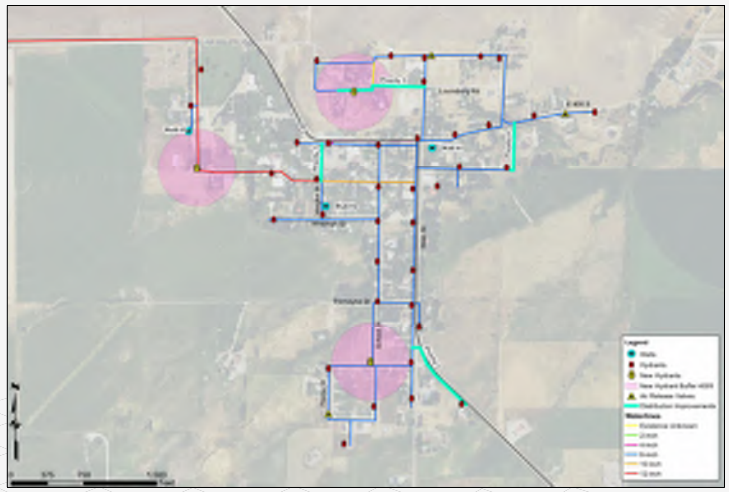
Piping Improvements – Alternative 2A

KELLER ASSOCIATES

- Address fire flow and looping issues
- Add fire hydrants in three areas currently lacking coverage
- Piping improvements split into priorities 1-4

Improvement	Qty	Cost Estimate (2021)
Priority 1 – Vaughn St	390 ft	$79,000
Priority 2 – South Hwy 77	845 ft	$159,000
Priority 3 – Lounsbury Rd	930 ft	$175,000
Priority 4 – E 800 S to South St	518 ft	$100,000
Fire Hydrants	3	$16,000
Total		$529,000



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Additional Improvements

KELLER ASSOCIATES

Sanitary Survey Deficiencies

- Well casing repair
- Chlorine protective equipment
- Rebuild well house #2
- Sampling plan creation

Recommended Improvements

- Tank mixers
- Rebuild well house #1
- Emergency generator

Meter Replacement

- Replacement meters
- Automated Meter Reading (AMR)

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Environmental Considerations

Environmental Screening Matrix

Description	Pumping Capacity & Storage Improvements	Distribution System Improvements
Physical Aspects	No Adverse Impact	No Adverse Impact
Land Use	Land required for tank & wells	No Adverse Impact
Wetlands and Water Quality	Improved Water Quality	No Adverse Impact
Flora and Fauna	Temporary Impacts During Construction	Temporary Impacts During Construction
Cultural Resources	No Anticipated Adverse Impact	No Anticipated Adverse Impact
Air Quality	Potential Temporary Impacts During Construction	Potential Temporary Impacts During Construction
Energy	Energy Savings from Improved Facilities Energy Expense from Additional Facilities	No Adverse Impact
Public Health	Improved Water Quality, Reliability, and Fire Protection	Improved Fire Protection

Capital Improvements Plan

Below costs include capital costs, mobilization, contingency, engineering, and 2 years of inflation

ID#	Item	Cost*
Priority 1 Improvements		
1B	Increase Well #1, add 2 new wells, & add 250,000 gal storage tank	$3,253,000
2A	Distribution System Improvements	$529,000
3	Sanitary Survey Improvements	$151,000
4	Recommended Improvements	$215,000
	Total Priority 1 Improvements	***$4,148,000***
Priority 2 Improvements		
5	Meter Replacement & AMR	$111,000
6	Water Rights Purchase**	$1,500,000
	Total Priority 2 Improvements	***$1,611,000***
	TOTAL WATER SYSTEM PRIORITY IMPROVEMENTS	***$5,759,000***

***Estimate. Actual cost will vary based on local/regional water rights market conditions.*

**Cost estimates are preliminary and are based on the current understanding of the project. Cost estimates will continue to be refined during the project planning and design process. Actual costs will be determined at time of bidding. The cost estimate herein is concept level information only based on our perception of current conditions at the project location and its accuracy is subject to significant variation depending upon project definition and other factors. This estimate reflects our opinion of probable costs at this time and is subject to change as the project design matures. Keller Associates has no control over variances in the cost of labor, materials, equipment, services provided by others, contractor's methods of determining prices, competitive bidding or market conditions, practices or bidding strategies. Keller Associates cannot and does not warrant or guarantee that proposals, bids, or actual construction costs will not vary from the cost presented herein.*

Funding Opportunities

Project funding typically consists of a combination of grants and low-interest loans

Funding agencies consider demographics and user rates

- Current Albion Water Rate - $33.00/150,000 gal + $1.00/additional 1000 gal
- To be eligible for some grants, user rate must be about $50/month
- According to American Water Works Association, utilities exceed "affordability" after they crest 2.5% of the median household income (MHI) ($116/month)

Keller Associates plans to work with Region IV Development Association Inc. to obtain the best funding package possible for the City

Potential funding sources include:

- **Idaho DEQ** (IDEQ) – Loan and Principal Forgiveness ('grant') – 20 to 30 Year Loan @ 1.5-3%/year
- **USDA – Rural Development** (USDA-RD) – Grants and Loans – Up to a 40 Year Loan @ 1.1-3%/year
- **Army Corps of Engineers Grants and Loans** (ACOE)
- **Special Appropriation Grants** (SAPP)
- **Idaho Bond Bank Authority** (IBBA)

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Rate Analysis

Increase in Monthly User Rate

Funding Scenario	Alt 1B	Alt 2A	Alt 3	Alt 4	Alt 5	Alt 6
USDA-RD, 25% Grant, 40-yr @ 1.125%	$42.92	$7.84	$3.55	$5.15	$2.33	-
DEQ, 2% Grant, 30-yr @ 1.75%	$72.71	$12.68	$4.93	$7.11	$3.35	-
Idaho Bond Bank, 30-yr @ 2.00%	-	-	-	-	-	$34.32

Assumptions

- Projects are constructed by 2023
- Projects are constructed in one phase with a single loan
- To be eligible for a USDA-RD grant, user rates would need to exceed $48-$50/month
- Grant and loan terms are likely to vary based on ARPA funding

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PLEASE TELL US HOW YOU FEEL . . .

The purpose of this public comment period is to provide the residents of Albion with detailed information regarding the community public water system. We hope that you have had the opportunity to learn more about the existing water system condition and seek answers to your questions or concerns. We would like to hear your comments and questions. Please write them in below and either give this to the City Clerk, a City Council member, or send your comments or questions to the following:

Email: tpratt@kellerassociates.com
Attention: Tyler Pratt
Keller Associates, Inc.
305 N. 3rd Avenue, Suite A
Pocatello, ID 83201
Phone: (208) 238-2146

Name: ______________________________ Phone: ____________

Address: ____

Email Address: ____

KELLER ASSOCIATES

CITY OF ALBION

Tyler Pratt

From: Matthew Hill
Sent: Monday, March 21, 2022 2:25 PM
To: City of Albion
Cc: Tyler Pratt
Subject: RE: Albion WFPS - Public Comment Period

OK. That makes things easy.

Thanks Mary!

MATTHEW B. HILL, PE
Keller Associates, Inc.
DIRECT 208-648-4215 | CELL 208-497-9552 | OFFICE 208-238-2146

From: City of Albion <albioncty@atcnet.net>
Sent: Monday, March 21, 2022 2:05 PM
To: Matthew Hill <mhill@Kellerassociates.com>
Subject: RE: Albion WFPS - Public Comment Period

Hi Mathew,
We did not receive any comments here at the office. Have a great day!
Thanks,
Mary Yeaman
City Clerk-Treasurer
City of Albion
PO Box 147
Albion, ID 83311-0147
208.673.5352
208.908.6535 Fax
Mary.Yeaman@albionidaho.org

Sent from Mail for Windows

From: Matthew Hill
Sent: Friday, March 18, 2022 9:49 AM
To: Isaac Loveland; 'Mary Yeaman'
Cc: Tyler Pratt
Subject: Albion WFPS - Public Comment Period

Isaac and Mary,

Did you receive any comments on the WFPS during the public comment period? If so, please pass them along to us so we can incorporate them into the final report and get it submitted to DEQ and USDA-RD.

Thanks,

305 N. 3rd Ave., Suite A | Pocatello, ID 83201 | 208.238.2146 | kellerassociates.com