

SECTION 1

INTRODUCTION

The City of Bellevue, Idaho (City) owns and operates Public Water System ID5070004 (PWS) to serve the community. The City is located in Blaine County, Idaho, along State Highway 75. A vicinity map is provided in **Figure 1-1**. The City's water system is currently comprised of two groundwater wells (Chestnut Street and Chantrelle wells), the Seaman's Creek Spring source, an approximate 1,000,000-gallon ground level storage reservoir, Strahorn booster station, and transmission and distribution system. The water system currently serves a total of 1,096 connections comprised of 34 commercial connections, 6 school connections, and 1,056 residential connections. City code and subsequent resolutions assign customer rates based on a base rate for all users regardless of the amount of water consumed, a user rate coupled directly with water consumed, and a connection fee for new connections.

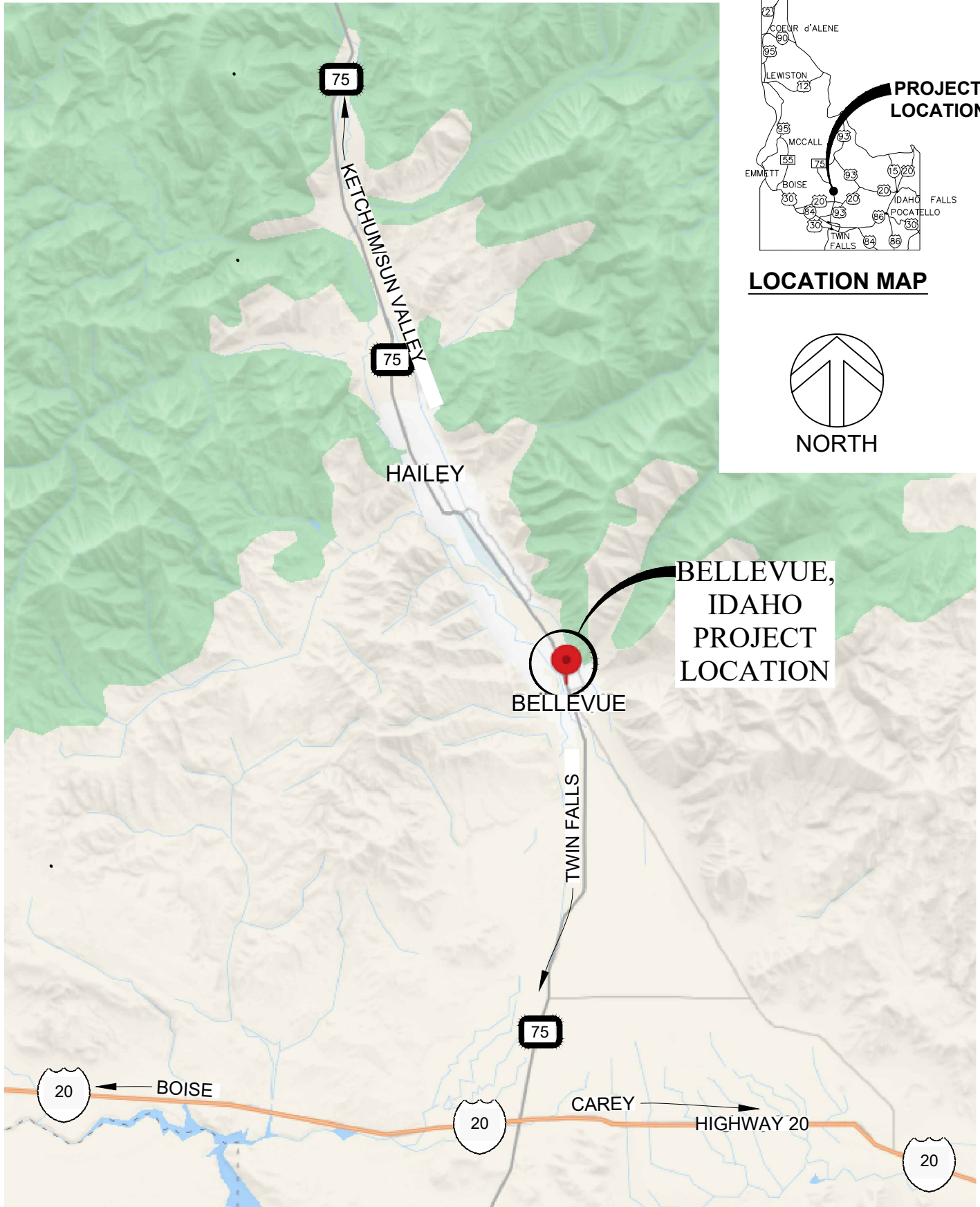
This Drinking Water Facility Plan is funded by the City, county, and Idaho Department of Environmental Quality (IDEQ).

1.1 Purpose and Need

The purpose of this Water System Facility Plan is to document the condition of existing water system infrastructure, identify deficiencies, and provide infrastructure improvement recommendations to meet the PWS's current and future water supply needs. This document serves as a 20-year master planning resource for future capital improvements to assist the PWS in compliance with the Idaho Administrative Procedures Act (IDAPA) Section 58.01.08, *Idaho Rules for Public Drinking Water Systems*. The document follows the requirements of IDEQ's "Drinking Water Outline and Checklist for Planning Document Attachment ENG-01", and addresses the following general requirements:

- Water System Introduction, Purpose and Need
- Documentation of Existing Condition of Water Facilities
- Development of Water Demands and Growth Projections
- Development of Capital Improvement Project Alternatives
- Recommended Alternative Description and Implementation Approach
- Incorporation of Public Participation
- Selection of Capital Improvement Projects

The City is currently under a compliance agreement with IDEQ related to addressing significant deficiencies identified in the 2021 sanitary survey. The primary goal of the capital improvement projects presented in this document is to return the PWS to regulatory compliance and provide a safe and sustainable supply of clean drinking water.



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VICINITY MAP

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FIGURE 1-1

1.2 System Background

The PWS serves the City of Bellevue, shown in **Figure 1-2**. The service area consists of 1,096 connections and is located on relatively level terrain. The majority of the system is in the same pressure zone, exception being the Strahorn development, and the hydraulic grade line (HGL) is set by the storage reservoir. A process flow diagram is shown in **Figure 1-3**.

The service area is primarily residential with limited commercial and municipal connections. There are two areas being considered for annexation, identified on **Figure 1-2**, one of town along Highway 75 and one south of town. In between the current boundary of the PWS and the planned annexation south of town, lies a development that is zoned for rural large lots. Each lot in this area are served by individual wells and septic systems.

1.3 Management and Water System Classification

The PWS is managed by the City and a responsible in charge operator. According to IDEQ System Classification, the distribution system is classified as a Class 2 system, there is no water treatment, and the system only chlorinates. Currently, the system is operated by a contract operator.

Current Operator in Responsible Charge:

Shane Garrison

- Backflow Assembly Tester | BAT 20720
- Drinking Water Distribution Operator – Class I | DWD1 – 21033
- Drinking Water Distribution Operator – Class II | DWD2 – 25542
- Drinking Water Treatment Operator – Class II | DWT2 – 25710

Substitute Operator in Responsible Charge:

Bryson Ellsworth

- Backflow Assembly Tester | BAT 19849
- Drinking Water Distribution Operator – Class IV | DWD4 – 23670
- Drinking Water Treatment Operator – Class II | DWT2 – 23459

1.4 Facility Plan Project Funding

Funding for the development of this Facility Plan and associated environmental review is provided in collaboration with Blaine County and Idaho Department of Environmental Quality (IDEQ) as follows:

Table 1-1: Funding Summary

Funding Source	Funding Amount
American Rescue Plan Act (ARPA) Drinking Water Grant (DWG-270-2023-21)	\$50,000
Blaine County ARPA Grant	\$50,000
Total Funding Package	\$100,000



Legend

- Spring Collection System
- Booster Pump Station
- Water Reservoir
- Wells
- Booster Pump Station
- City Limits

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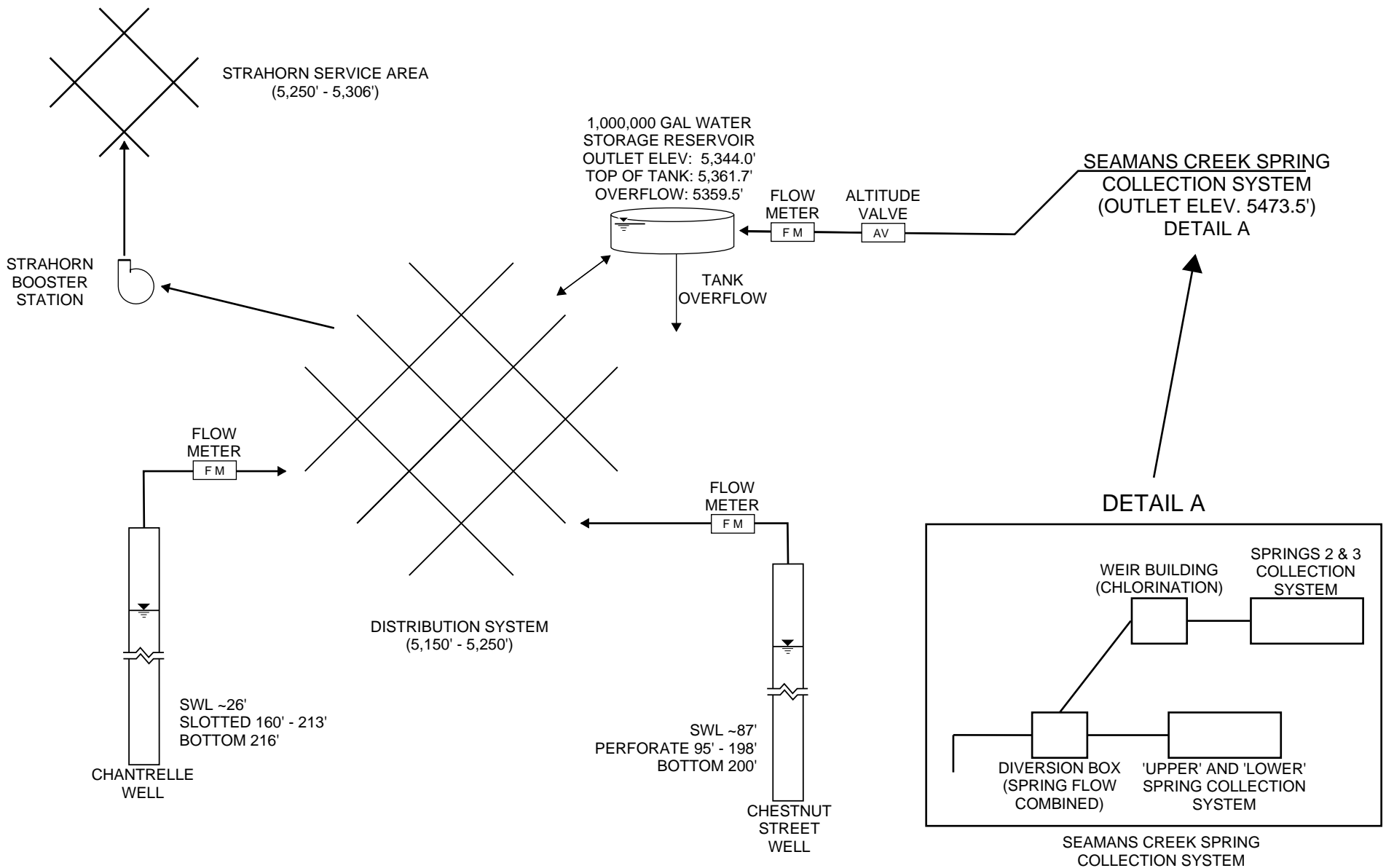
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SYSTEM OVERVIEW

City of Bellevue, Idaho

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FIGURE 1-2



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Mountain WATERWORKS

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PROCESS FLOW DIAGRAM

CITY OF BELLEVUE WATER FACILITY PLAN

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FIGURE 1-3

SECTION 2

ENTERPRISE FUND BUSINESS

2.1 Enterprise Fund Definition

Idaho Code §50-1032 requires municipal corporations that own and operate public utility systems be financially sound and utilize an “enterprise fund” accounting system. Enterprise funds are financed primarily through user charges and inherently follow Generally Accepted Accounting Principles (GAAPs). As the municipal utility provides services to the public for a fee, collection of fees creates a revenue stream allowing the utility to remain a self-supporting municipal enterprise and provide for the actual cost of service. The sum the utility must collect to remain self-supporting is defined as the “revenue requirement.”

The revenue requirement is calculated by summing the 1) operation and maintenance cost, 2) debt service, including loan principal and interest payment and debt reserve, and 3) the depreciation cost of assets owned and operated by the utility. It is the responsibility of the utility owner to develop a rate structure that will provide sufficient income to meet the revenue requirement.

2.2 Water System Rates and Ordinances

In October 2019, the City passed Resolution #2162 (**Appendix A**) which sets the fee schedule, assessments and charges for the City’s water rates. The residential and commercial water rates and connection fees are summarized in **Table 2-1**.

Table 2-1: Water Rates (per City Resolution #2162)

Customer Rates	
Rate Block	Rate
Base Rate + 6,500 gallons	\$33.70
Greater than 6,501 gallons	\$1.09 per 1,000 gallons

2.3 Budget Review

A summary of operating expenses and revenue for the 2019-2022 fiscal years are provided in **Table 2-2**. City financial audits from 2019 through 2022 are included in **Appendix B**. The City of Bellevue’s water utility consistently operates with a positive net operating income which has been sufficient in three of the previous four years to fund system depreciation and allow for a cash reserve. The City budgets approximately \$47,000 for depreciation each year and includes it within their Non-Operating Expenses. The negative net income in 2019 was brought about by unforeseen expenses for water system repairs. The difference between operating expenses and revenue is balanced by cash carryover and revenue from other city departments.

Table 2-2: Audited Annual Water Revenue and Expenses (2019-2022)

Fiscal Year	2019	2020	2021	2022
	Actuals	Actuals	Actuals	Actuals
Operating Revenues	\$450,614	\$438,319	\$515,581	\$512,409
Non-Operating Revenues (Expenses)	\$(645)	\$(11,358)	\$184,711	\$218,506
Operating (Expenses)	\$(378,437)	\$(314,104)	\$(346,460)	\$(425,778)
Net Income (Loss) Prior to Depreciation	\$71,532	\$112,857	\$353,832	\$305,137
Depreciation (Expense)	\$(103,255)	\$(105,086)	\$(108,355)	\$(109,197)
Net Gain (Loss)	\$(31,723)	\$7,771	\$245,477	\$195,940

To ensure the PWS is sustainable in future years, it is recommended a 20-year capital improvement program (CIP) be adopted by the City to replace its existing aging infrastructure over time. It is also recommended that an annual replacement plan (and budget) for the City's aging water facilities be implemented and funded through customer rates.

Depreciation rates are shown in **Table 2-3** and should be used as a guideline for budgeting annual projects required to replace aging infrastructure over the course of the public water systems' useful life. For example, in the Depreciation Schedule, transmission and distribution water mains have an estimated useful life of 50 years. In this example, the City may consider replacement of 1/50th of the water mains in the system every year or 2% of the cost of these facilities.

Table 2-3: Depreciation Schedule

Depreciation Schedule		
Facility Description	Useful Life	Depreciation Rate
Transmission and Distribution Mains	50 years	2.0%
Water Storage	50 years	2.0%
Water Treatment	20 years	5.0%
Pumping Facilities	25 years	4.0%
Water Supply (wells)	50 years	2.0%

Tracking revenue and expenses can be useful in analyzing historical budgets thereby informing future budget preparation processes. **Table 2-4** summarizes the City's Water Fund approved budget for 2023.

Table 2-4: Water Fund Budget (2023)

Revenues	
Water Charges for Services	\$424,370
Misc. User Fees	\$500
System Capitalization Fees	\$27,000
Water Meter and Vault Fees	\$4,254
Connection Fees	\$6,728
Application and Administrative Fees	\$500
Interest Income	\$1,000
Permits	\$300
Grants	\$50,000
Revenue Total	\$515,152
Operating Expenses	
Total Payroll	\$242,393
Operating Expenses	\$284,386
Operating Expenses, Total	\$526,779

2.4 System Authority and Administration

The City of Bellevue is a municipal entity in the State of Idaho. Idaho code title 50-301 and 50-323 for municipal corporations give the City of Bellevue the power to self-govern, maintain, and operate their public water system. The Idaho Statutes Title 50 for Municipal Corporations, Chapter 3 Powers can be found on the Idaho Legislature website, detailing the legal capacity of the City (<https://legislature.idaho.gov/statutesrules/idstat/Title50/T50CH3/>).

SECTION 3

REGULATORY REQUIREMENTS

This section addresses water quality and supply regulations that govern operation of the PWS. These regulations are enforced by three entities: the Environmental Protection Agency (EPA), IDEQ, and the Idaho Department of Water Resources (IDWR). Their responsibilities and areas of responsibility are described below.

3.1 Regulatory Entities

3.1.1 Environmental Protection Agency (EPA)

The Environmental Protection Agency (EPA) implements mandates associated with the Clean Water Act (CWA) as amended in 1972, the Extended Surface Water Treatment Rule (ESWTR), the 1974 Safe Drinking Water Act (SDWA), and additional statutes passed by Congress, by 1) establishing legal limits for contaminants in drinking water at the federal level and 2) determining the methods by which water systems must test these contaminants. The EPA currently enforces drinking water regulations for more than 90 contaminants.

3.1.2 Idaho Department of Environmental Quality (IDEQ)

IDEQ was created by the Idaho Environmental Protection and Health Act (Idaho Code Title 39) to administer federal environmental laws and enforce state water quality standards contained in IDAPA 58.01.08. At a minimum, IDAPA 58.01.08 includes federally required regulations, but may also include rules more stringent than the EPA's regulations. IDEQ's Water Quality Division ensures public drinking water systems deliver safe water to customers and protects water bodies within the state of Idaho.

3.1.3 Idaho Department of Water Resources (IDWR)

IDWR administers surface water and groundwater rights for water users in the state, determines if water rights are being put to beneficial use, issues permits for groundwater well construction or diversion of surface water, and oversees the development of the Idaho Comprehensive State Water Plan. The City is within the Big Wood River Management Area (BWRMA). Water rights within the BWRMA have been fully appropriated.

3.2 Surface and Groundwater Quality Regulations

The PWS must comply with water quality standards specified in the SDWA, which authorizes the EPA to establish minimum water quality standards for public water systems. The SDWA has been modified several times since its initial passage, with the goal of safeguarding public health. The rules summarized in **Table 3-1** cover both microbial and chemical contaminants that may be present in surface or groundwater.

Table 3-1: Water Quality Regulations Overview

Microbial Contaminants Rules	Chemical Contaminants Rules
Surface Water Treatment Rule (1989) <ul style="list-style-type: none"> • Interim Enhanced Surface Water Treatment Rule (1998) • Filter Backwash Recycling Rule (2001) • Long Term 1 Enhanced Surface Water Treatment Rule (2002) • Long Term 2 Enhanced Surface Water Treatment Rule (2006) 	Chemical Contaminant Rules (1987) <ul style="list-style-type: none"> • Phase II (1991) • Phase IIB (1991) • Phase V (1992) • Arsenic Rule (2001)
Stage 1 and Stage 2 Disinfectant/Disinfection Byproducts Rules (DBPRs)	Lead and Copper Rule (1991) <ul style="list-style-type: none"> • Short-Term Revisions to the Lead and Copper Rule (2007)
Ground Water Rule (2006)	Radionuclides (1977) <ul style="list-style-type: none"> • Radionuclides Final Rule (2000)
Total Coliform Rule (1989) <ul style="list-style-type: none"> • Revised Total Coliform Rule (2013, 2014) 	

3.2.1 National Primary Drinking Water Standards

Under the SDWA, the EPA establishes national primary drinking water standards (NPDWS) for contaminants which are shown to adversely affect public health. The allowable concentration of these contaminants in drinking water is controlled through establishment and enforcement of Maximum Contaminant Levels (MCLs). Maximum Contaminant Level Goals (MCLGs) are non-enforceable targets that are established at concentrations where there is no anticipated adverse effect on human health. The state of Idaho implements these rules for the EPA. A full list of primary drinking water standards can be found at <https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations>.

3.2.2 National Secondary Drinking Water Regulations

National Secondary Drinking Water Regulations (NSDWR or secondary standards) are non-enforceable guidelines regulating contaminants that may cause aesthetic effects in drinking water, such as taste, odor, or color. As secondary MCLs are not enforceable, no action is required on the part of the PWS in the event of an exceedance. A full list of primary drinking water standards can be found at <https://www.epa.gov/sdwa/secondary-drinking-water-standards-guidance-nuisance-chemicals>.

3.3 Sanitary Survey

The most recent sanitary survey was conducted on July 14, 2021 (**Appendix C**). This survey identified significant deficiencies and deficiencies throughout the system. Processes identified as having deficiencies include the groundwater sources, storage, chlorination, and operations and planning. Significant deficiencies except for those surrounding the spring collection system have been addressed.

The scope and scale of the deficiencies identified at the spring collection system led to the City entering into a Compliance Action Schedule (CAS) agreement with IDEQ to remedy the noted deficiencies. Both deficiencies and significant deficiencies are summarized by process in the following sections.

3.3.1 Groundwater Sources

Several significant deficiencies were identified at the Seamans Creek Spring Collection System, that revolve around the original construction of the collection system, primarily that multiple aspects of the system are not properly sealed against contamination. The primary aspects of concern are the multiple observation points (unsealed vertical pipe sections from spring to atmosphere) and weir boxes. These significant deficiencies span from the spring boxes themselves through to the overflow structures. In addition to not being sealed against contamination much of the spring collection system is not lockable and does not prevent tampering. The observation ports have since been outfitted with locking lids, but the lids are not sealed against contamination.

Groundwater sources also had three specific deficiencies identified as follows:

1. The discharge pipe for the Seaman's Creek Spring collection system lacks an approved sampling point and the location is unknown.



Photo 3-1: Spring Observation Port

2. The Seaman’s Creek Spring collection box cannot be drained.
3. The Chantrelle well lacks a pressure relief valve and the valves and appurtenances required to pump to waste.

3.3.2 Storage

The reservoir’s lack of fencing was identified as a significant deficiency. The storage reservoir cannot be isolated from the system without causing a drop in system pressure, which is also identified as a deficiency.

3.3.3 Disinfection

The chlorination system at all three of the water sources was not properly vented to the outside. Several other deficiencies were identified at the groundwater wells relating to the storage rooms and required onsite safety equipment.

3.3.4 Administration

Several deficiencies were identified in regard to the administration of the PWS. These include the lack of a cross connection control program, improper licensure of the operator, lack of written sample siting plan, lack of a complete operation and maintenance manual for the system, and lack of safety equipment distributed throughout the system. These items have been addressed.

3.4 Water Rights Summary

The City possesses four water rights (**Table 3-2**) issued by the IDWR for diversion of springs and groundwater for municipal use (**Appendix D**). All water rights have the same point of use, the service area of the City of Bellevue municipal water supply stem as provided for under Idaho Law.

Table 3-2: Water Right Summary

Water Right No.	Priority Date	Beneficial Use	Source	Maximum Allowable Diversion Rate	Period of Use
37-1208	07/20/1880	Municipal	Springs	3.0 cfs 1,346 gpm	1/1 - 12/31
37-7637	06/01/1977	Municipal	Groundwater	2.0 cfs 898 gpm	1/1 - 12/31
37-8848	06/06/1995	Municipal	Groundwater	3.35 cfs 1,503 gpm	1/1 - 12/31
37-8862	05/23/1997	Municipal	Groundwater	0.67 cfs 301 gpm	1/1 - 12/31
Total Allowable Diversion Rate				9.02 cfs 4,048 gpm	

SECTION 4

CUSTOMER WATER USAGE AND SYSTEM DEMANDS

This section presents the existing water demands in the system and develops design demands on an equivalent dwelling unit (EDU) basis for use in analysis of existing water system facilities.

4.1 Customer Base

To ensure parity between the analyses in the City of Bellevue, Wastewater Facility Plan Update DRAFT (WWFP; Keller Associates, February 2023) and the analysis presented here, the customer base estimations from the WWFP was adopted here. Population values from 2022 were used as the current customer base, a population of 2,684. Per City data there are 975 total connections and 1125 EDUs.

Table 4-1: 2022 Population and EDUs

Location	Population	EDUs ¹
Bellevue	2,684	1,125

Note:

1. EDU numbers provided by City, equates to 2.4 people/EDU.

4.2 Water Production

The system has three sources: two wells and a spring collection system. The spring collection system is the primary source, followed by the Chantrelle Well, with the Chestnut Street Well being used only during the summer months. Operators record production from each source daily. Well production data is read from flow meters within each well house. Production from the spring collection system is read from a flow meter on the fill line to the reservoir. As each of these systems have some variability in both daily production and when each of the systems are read, a 5-day moving average was used to smooth this inherent variability. Daily production data is presented in **Figure 4-1**.

Production data is further broken down by month in **Table 4-2** and seasonally in **Table 4-3**. The high production in February is due to a main break event in 2022. There is a large irrigation demand on the system, this can be seen based on the difference in production between the summer months, May through September, and the winter months. Average summer demand is over three times average winter demand.

Table 4-2: Daily Production Data Summarized by Month (thousands of gallons)

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Average	490	656	504	556	992	1,685	2,705	2,249	1,596	786	510	428
Max	548	1,601 ¹	574	781	1,427	2,329	3,301	3,138	2,426	1,248	628	473

Note:

1. Recorded line break in February 2022.

Table 4-3: Seasonal Average Production (gallons)

	Winter ¹	Summer ²
Average	580,000	1,848,000

Notes:

1. Winter is October through April
2. Summer is May through September

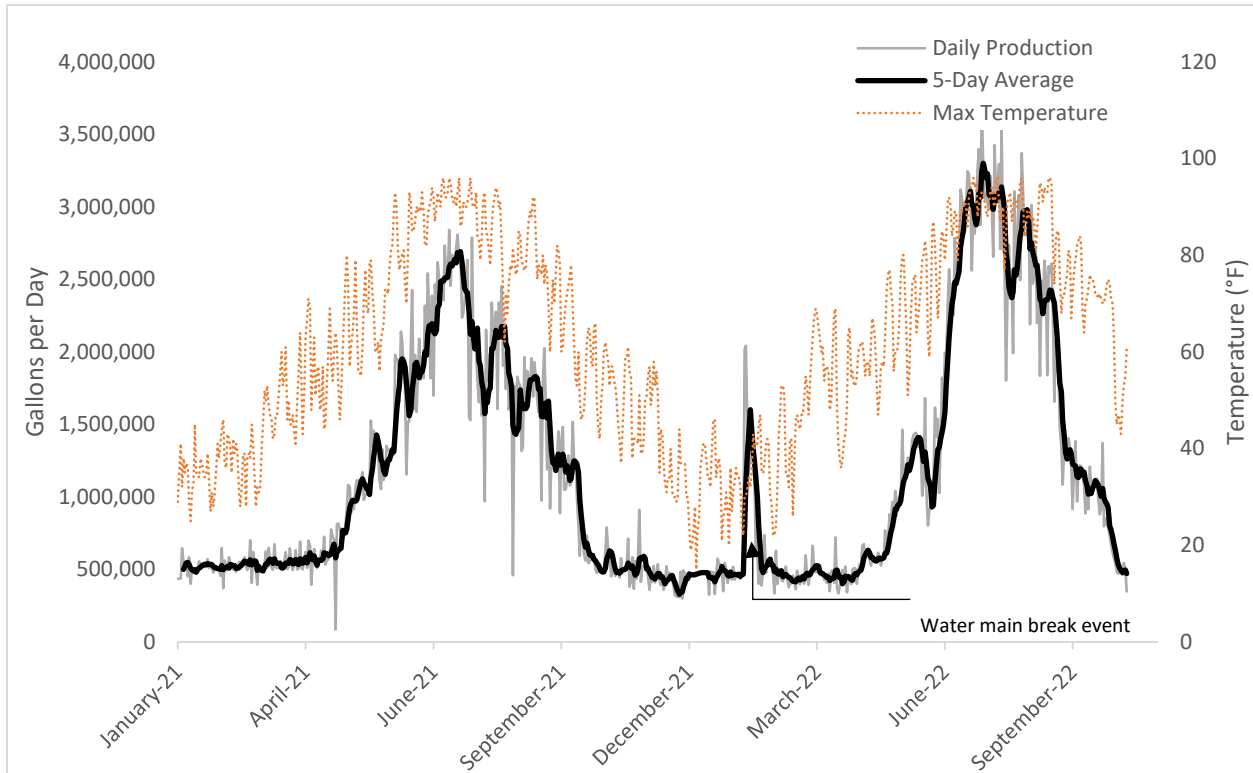


Figure 4-1: Daily Production and Temperature

There is a strong correlation between air temperature and water usage documenting the impact of irrigation activities on the PWS.

4.3 Non-Revenue Water Estimates

Due to the lack of consumer meters in the system, the amount of non-revenue water in the system is unknown. However, it is expected that there are significant leaks throughout the system due to the age and material of some of the distribution system. These leaks are expected to be unseen on the surface because the City is sited on a historic riverbed with good vertical drainage through the soil strata.

4.4 Water System Design Demand Development

The majority of the system is unmetered, and the service connections that do have meters are not regularly read. Taking this into account, it was assumed that water demand is distributed uniformly across the EDUs, and no further breakdown in demands is provided.

Design demands were developed from the production data. The Average Day Demand (ADD) is from the daily production data, the Maximum Day Demand (MDD) was calculated from the 5-day moving average, and the Peak Hour Demand (PHD) was calculated using the ADD and a peaking factor of 4.

Table 4-4: Current Water System Design Demands

Parameter	Flow (gpd/EDU)	Flow (gpm/EDU)	Flow (gpd)	Flow (gpm)	Peaking Factor
Average Day Demand	1,030	0.72	1,160,000	806	1.0
Maximum Day Demand	2,934	2.04	3,301,000	2290	2.8
Peak Hour Demand	4,122	2.86	4,637,000	3220	4.0

Per EDU consumption is significantly higher than the typical average day demand of 110 gallons per person, or 264 gallons per EDU. It is expected that these values can be attributed to unmetered accounts, system leaks and partially to flowmeter measurement error. The flowmeter connected to the spring system, the primary water source, is likely out of calibration. At the time of this report, the flowmeter is planned to be replaced.

Although higher than typically expected, the system demands are not considered unrepresentative and will be used.

SECTION 5

EXISTING FACILITIES AND CONDITIONS EVALUATION

5.1 Public Water System Summary

The Bellevue Water Distribution System is owned, operated, and maintained by the City of Bellevue. The water system is served by three sources: Chestnut Street and the Chantrelle groundwater wells, and the Seamans Creek spring collection system. The sole water storage reservoir is filled from the distribution system and maintains system pressure. The distribution system is partially looped and with few exceptions the watermains are at least six inches in diameter. There is one area of town that is served via booster station.

5.2 Source of Supply

5.2.1 Seamans Creek Springs

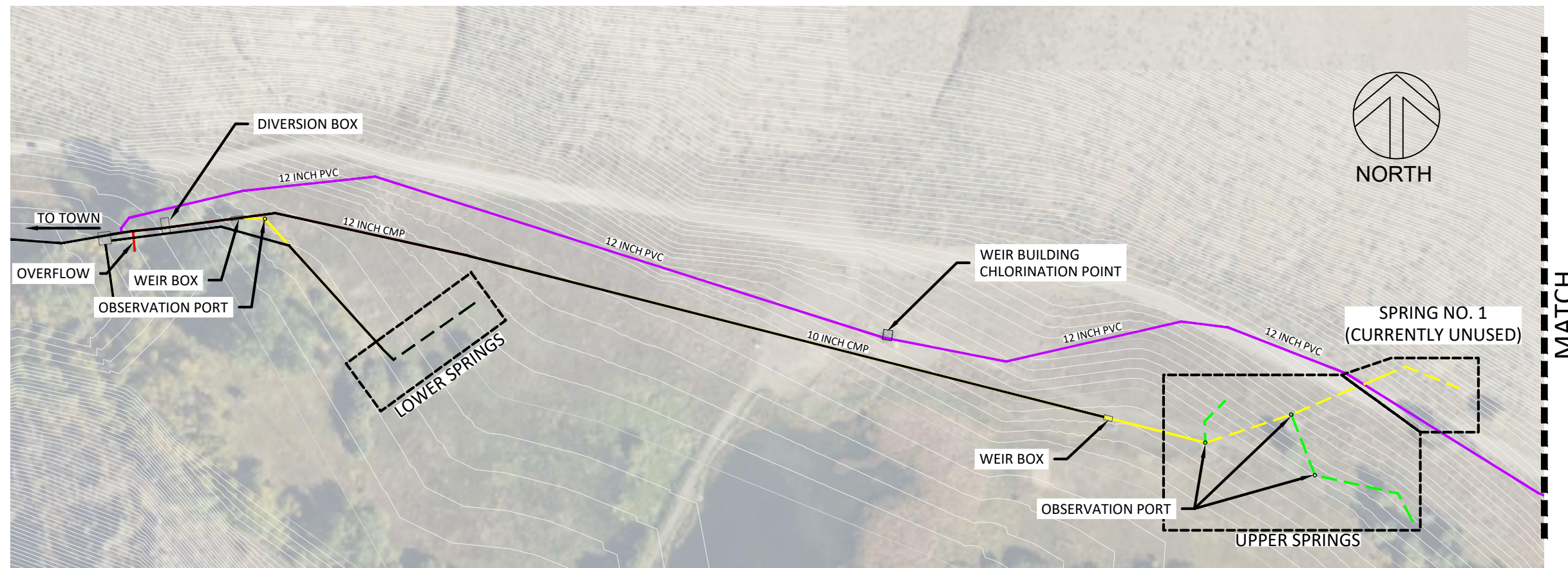
Seamans Creek Springs Water Source consists of multiple spring sources that are collected and aggregated, chlorinated, and connected to the distribution system via dedicated transmission main. The springs system was originally constructed in the early 1900's with additional spring collection infrastructure added in the mid 1980's. The spring source targets groundwater ranging from two feet to eight feet below ground surface (BGS). The spring collection system is



approximately three miles east of the Storage Reservoir within the Seamans Creek Drainage (**Appendix E**). The layout of the spring system is shown in **Figure 5-1**.

The spring system has three main zones, the Upper Springs, the Lower Springs, and Springs No. 1, 2, and 3. The Upper and Lower Spring collection systems are along the valley floor, while Spring Nos. 1, 2, and 3 are adjacent to Muldoon Canyon Road. The collection systems are constructed similarly, although materials differ to due age of construction. The springs are collected via buried perforated pipe, piped to concrete weir boxes, combined, chlorinated, and piped to the city. Spring No. 1 has been valved off and is not in use. There are multiple observation ports throughout the collection system (approximately four). These observations ports are unsealed corrugated metal pipe with a fabricated plate steel hatch on top (**Photo 5-1**).

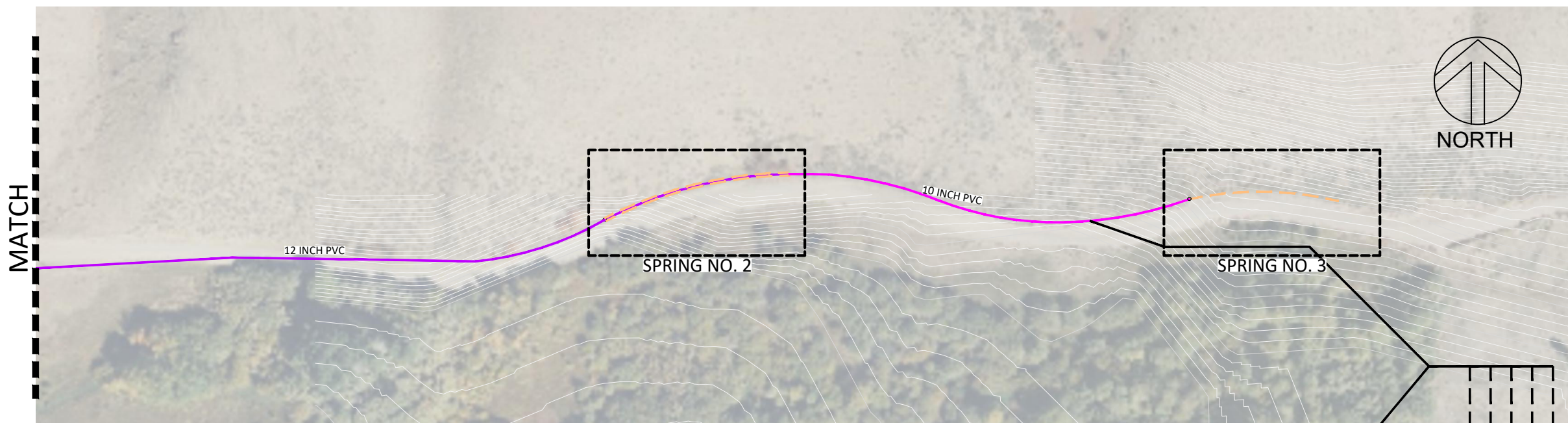
Photo 5-1: Spring Observation Port



1 UPPER & LOWER SPRING COLLECTION SYSTEM
SCALE: 1" = 150'

LEGEND

- PERFORATED PIPE
- 10-INCH PVC
- 12-INCH PVC
- 8-INCH CMP
- 10-INCH CMP
- 12-INCH CMP
- 10-INCH ADS



2 SPRINGS 2 & 3 COLLECTION SYSTEM
SCALE: 1" = 150'

Path: Q:\Water\Projects\A-D\Bellevue_20170020_DWFP\Deliverables\Facility Plans\Figures\Spring Figures\Spring Figures.dwg File Name: Springs Figures.dwg Plot Date: 10/23/2023 8:52 AM enc:mtl

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FIGURE NO. :	FIG 5-1



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**FIGURE 5-1: SEAMANS CREEK
SPRING COLLECTION SYSTEM
WATER FACILITY PLAN
BELLEVUE, IDAHO**

The spring collection system had multiple significant deficiencies identified in the 2021 Sanitary Survey; correcting these deficiencies led to a CAS agreement between IDEQ and the City. The majority of the deficiencies identified relate to the initial construction of the system. Much of the ground level infrastructure (observation ports, weir boxes, diversion box) are not sealed against contamination and pests as required by IDAPA. **Photo 5-2** shows the root intrusion into the Lower Spring Weir Box.

Given these deficiencies, the springs system was tested for surface water influence via microscopic particulate analyses (MPA) in Spring 2023. An MPA test was conducted on each of the spring sources, and results indicated “not significant”, or below the measurement threshold. Full description and results of the MPA test can be found in **Appendix F**.

Issues and Concerns

- City does not own land which spring collection system is located.
- Much of the system is beyond its design life.
- The collection system is not sealed against contamination.
- Collection system is relatively shallow in some areas and could be susceptible to surface water contamination.
- Flow meter is likely out of calibration and replacement of the meter is pending.

5.2.2 Chestnut Street Well and Facility

The Chestnut Street Well is located at 811 Chestnut Street and was drilled in 1978 and was completed to a depth of 199.5 feet. The borehole is 16 inches in diameter to 28 feet BGS and 12 inches to 199.5 feet. Well casing is 12-inch steel, the well was drilled with a cable drill rig and casing drive shoe. Perforations were then cut into the casing. The static water level at the time of drilling was 87 feet BGS. A schematic of the Chestnut Street Well is presented in **Figure 5-2**.

The well is equipped with a 100-horsepower line shaft vertical turbine pump. The chlorination system was switched from gas to liquid in 2022 in response to the sanitary survey. The current chlorine system consists of a day reservoir, spill proof pallet, and a chemical metering pump. At the point of injection into the mechanical piping the chlorine is injected using brass which as a material is not resistant to corrosion from chlorine. The City is not currently chlorinating at this well. The mechanical piping does not include a pressure relief valve and has a combination air valve in place of a well service valve. A schematic of the Chestnut Street Well Facility is shown in **Figure 5-3**.

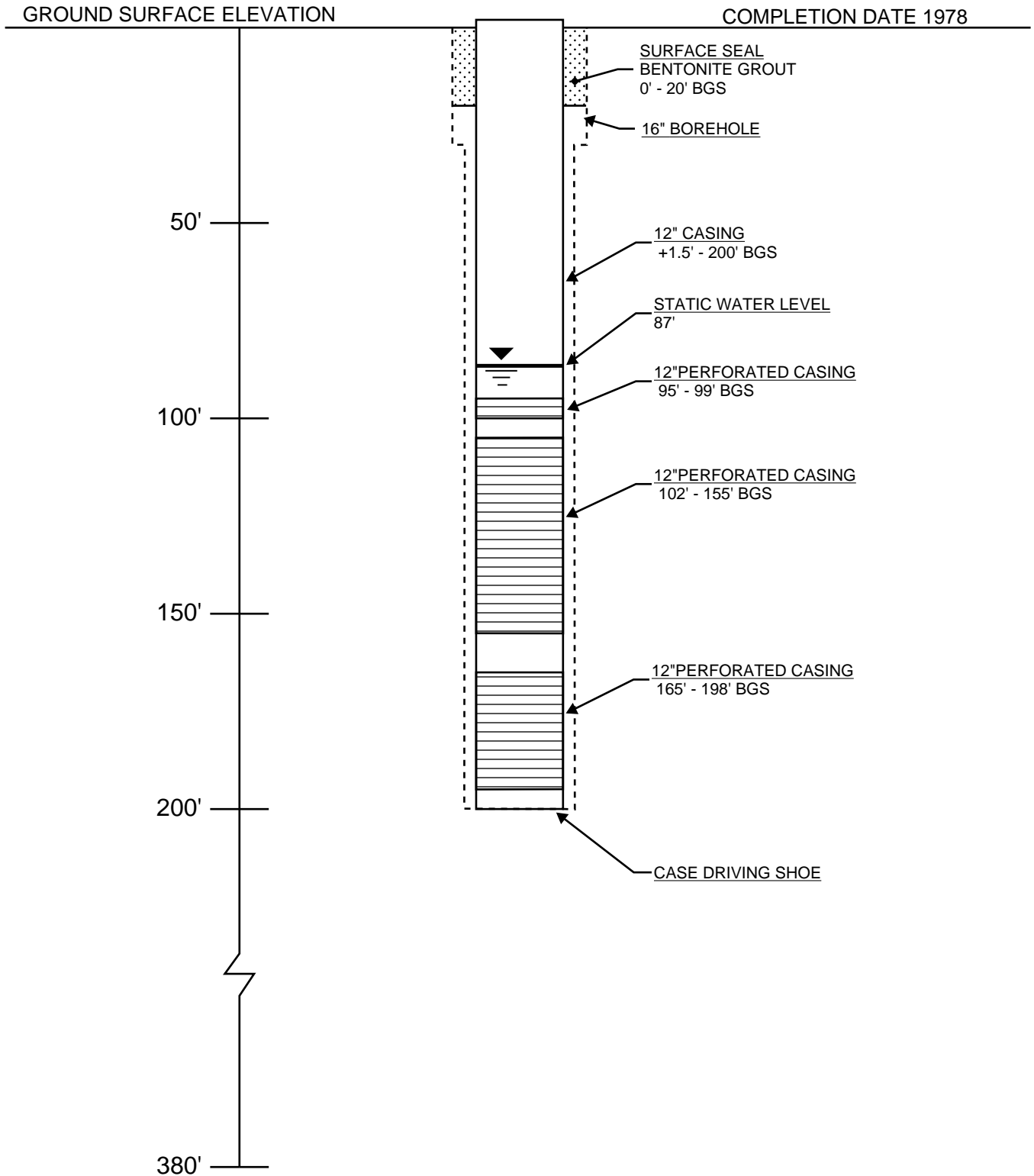


Photo 5-2: Lower Springs Weir Box

Limitations

- The mechanical piping does not have a pressure relief valve.
- There is a combination air valve installed in place of a well service valve.
- Chlorination equipment constructed using brass.

CITY OF BELLEVUE - CHESTNUT STREET WELL



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CHESTNUT STREET WELL

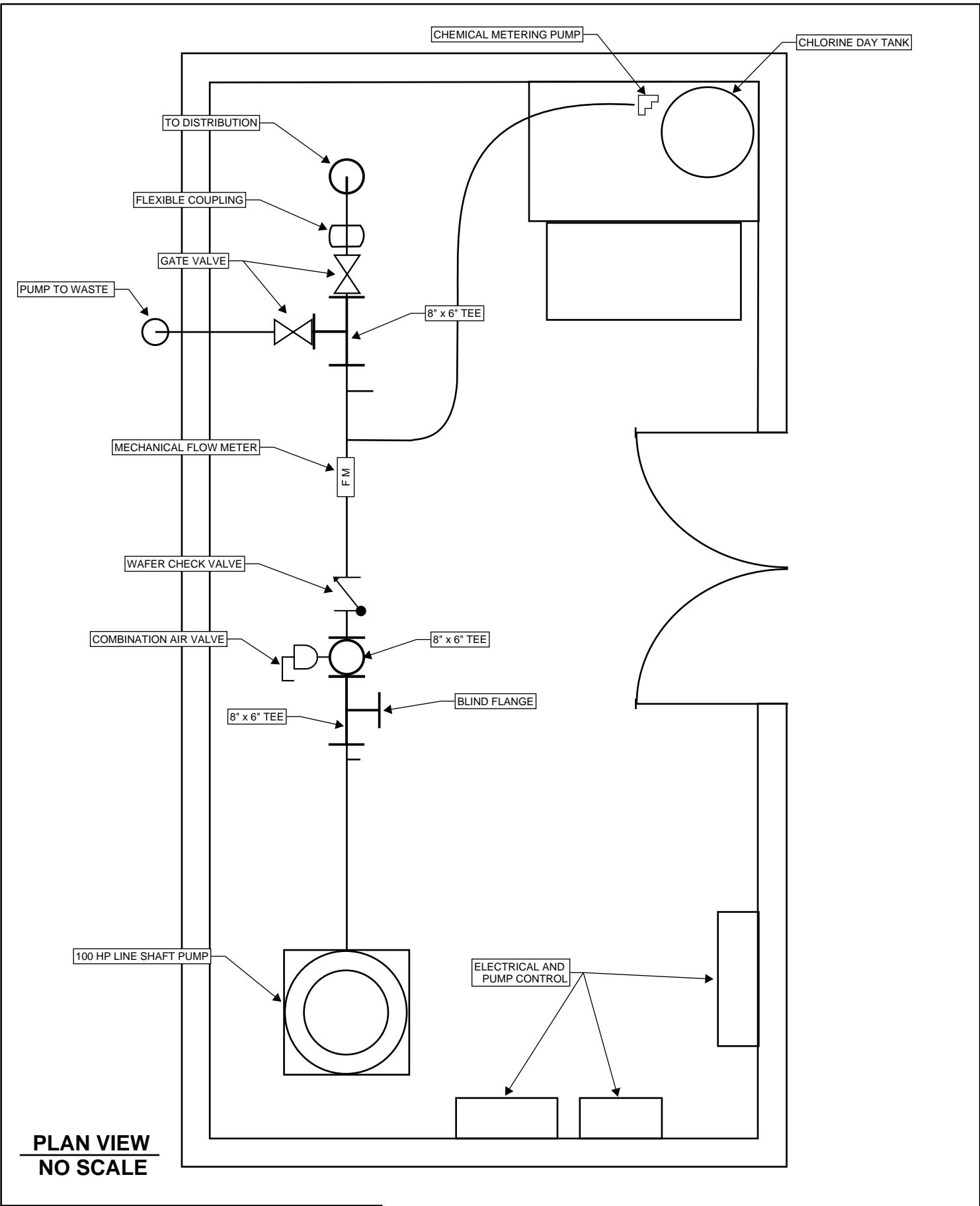
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FIGURE 5-2



**PLAN VIEW
NO SCALE**



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CHESTNUT STREET WELL FACILITY SCHEMATIC

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FIGURE 5-3

5.2.3 Chantrelle Well and Facility

The Chantrelle Well and Facility were constructed in 1995 as part of the Chantrelle Subdivision. The well borehole is 20 inches in diameter to a depth of 60 feet BGS and is 16 inches in diameter to a depth of 255 feet BGS. The constructed well was completed to a depth of 216.5 feet. The casing is 16 inches in diameter and was installed using an air rotary drilling method and a casing shoe. The casing was perforated from 160 to 213 feet BGS. A schematic of the Chantrelle Well is presented in **Figure 5-4**.

The well is equipped with a 150-horsepower line shaft vertical turbine pump. The chlorination system at the Chantrelle Well Facility was converted to liquid chlorine alongside the Chestnut Street Well Facility using the same equipment. The City is not currently chlorinating at this well. The mechanical piping is 8-inch ductile iron. Air and vacuum relief is provided by a combination air release valve. The system does not have pump to waste capabilities or a pressure relief valve. A schematic of the Chantrelle Well Facility is presented in **Figure 5-5**.

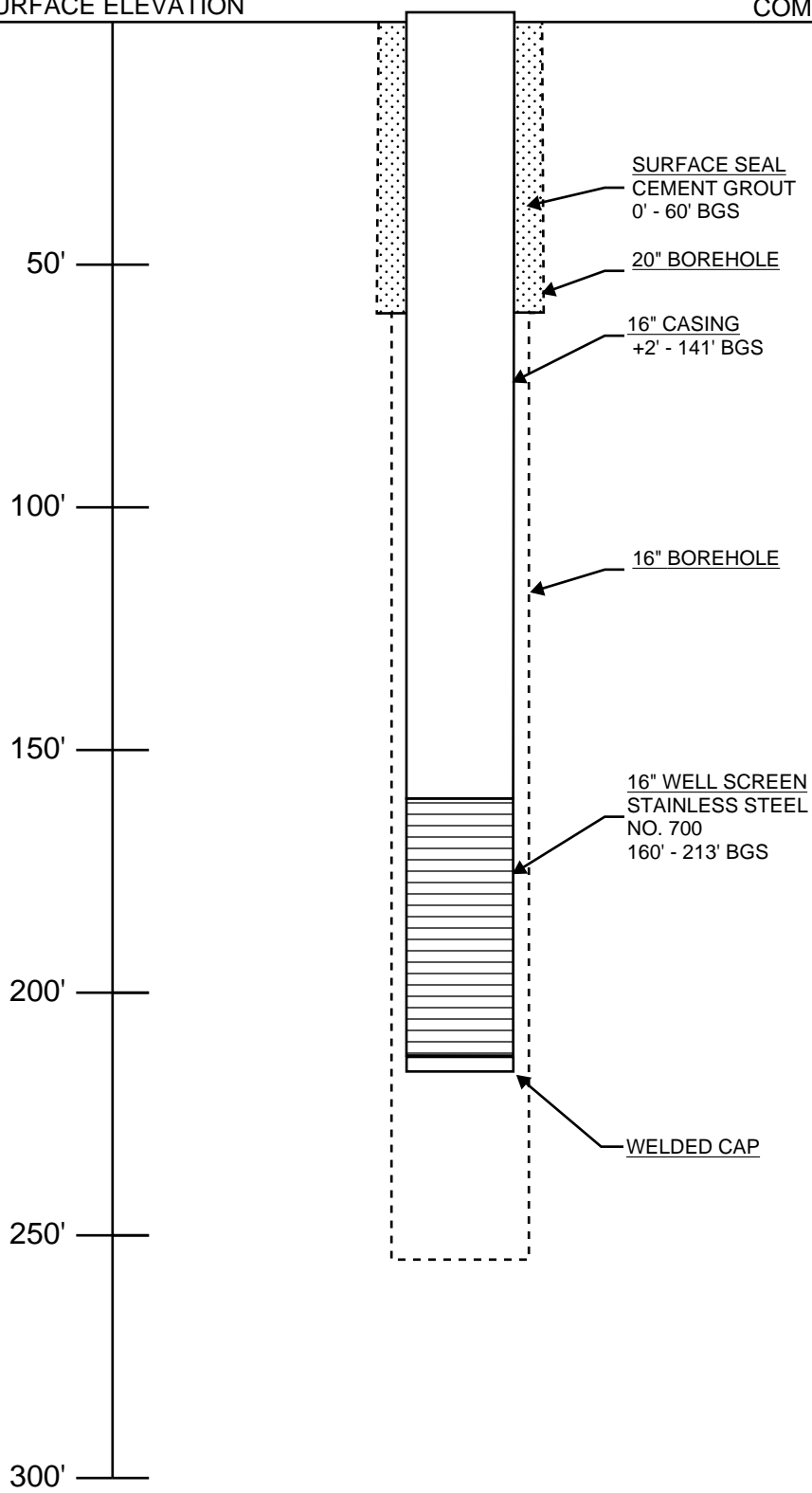
Limitations

- No pump to waste capabilities or pressure relief.
- Chlorination equipment is constructed of brass.
- Combination air valve instead of a well service valve.
- Inaccurate flowmeter when tested against temporary flowmeter in December 2022.
 - City plans to replace this flowmeter October 2023.

CITY OF BELLEVUE - CHANTRELLE WELL

GROUND SURFACE ELEVATION

COMPLETION DATE 1995



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CHANTRELLE WELL

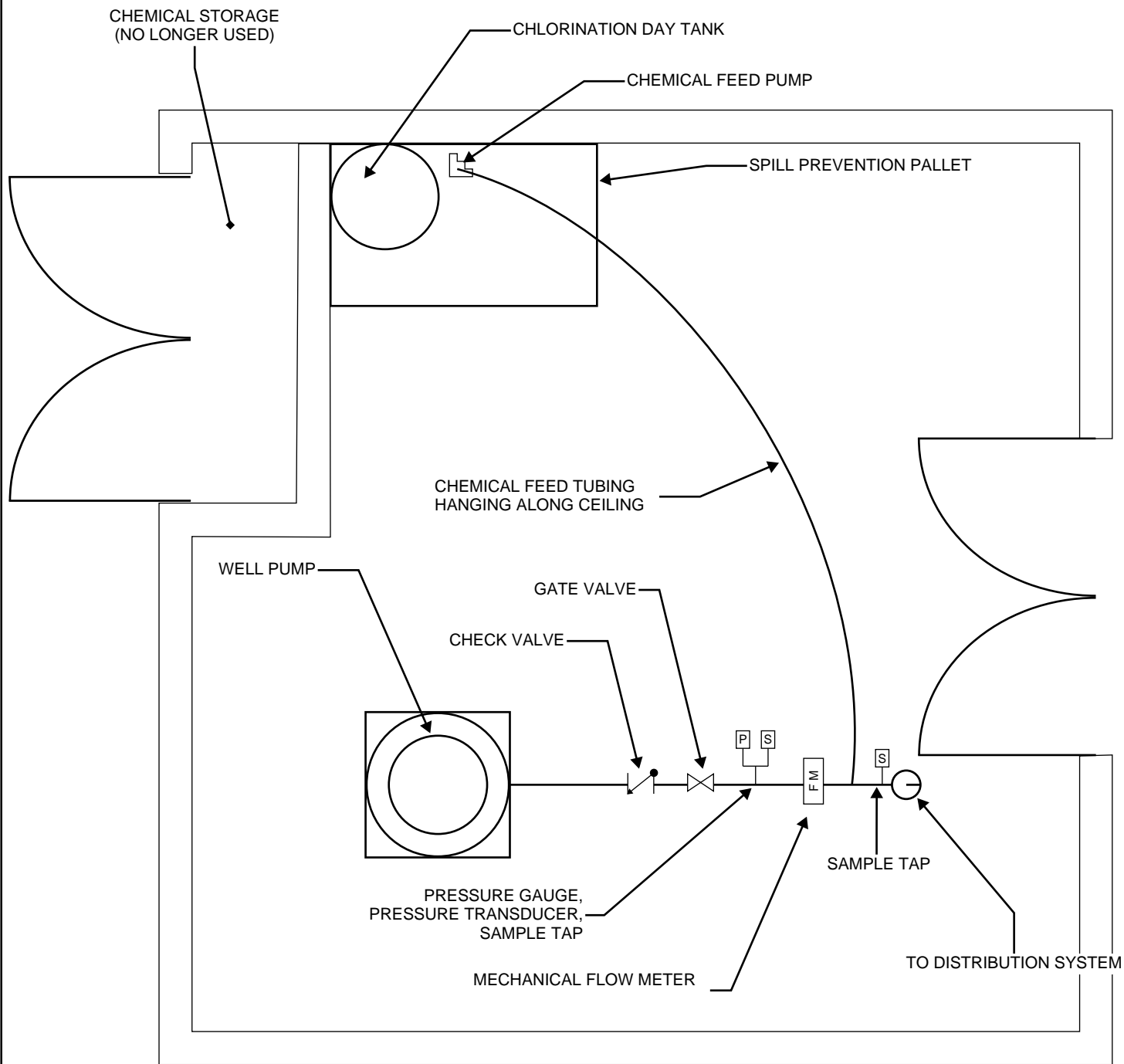
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FIGURE 5-4



PLAN VIEW
NO SCALE



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CHANTRELLE WELL FACILITY

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FIGURE 5-5

5.2.4 Source of Supply Summary

Per IDAPA the system must be able to meet MDD with the largest source offline, which is defined as firm capacity. For the City of Bellevue, the largest source is the Chantrelle Well as shown in **Table 5-1**. Firm capacity versus current demands is summarized in **Table 5-2**. Under current MDD (2,290 gpm) conditions, firm capacity (2,350 gpm) is satisfied.

Table 5-1: Water Source Capacity Summary Table

Source	gpm
Chestnut Street Well	1,000
Chantrelle Well	1,500
Seamans Creek Springs ¹	1,350

Note:

1. Full Seamans Creek production is unknown. Assumed to be equivalent to water right.

Table 5-2: Current Source Water/Water System Demands Summary

System Operation	Source Capacity	Maximum Day Demand	Surplus (Deficit)
	(gpm)	(gpm)	(gpm)
All Sources Operational	3,850	2,290	1,560
Largest Source Out of Service	2,350	2,290	60

5.3 Water Quality

The source water for the PWS is ground water, the water quality requires no additional treatment and is not expected to change in the future. Source water sampling results are summarized in **Table 5-3**.

Table 5-3: Source Water Quality Summary

Analyte Code	Analyte Name	Chantrelle		Chestnut		Seamans Springs	
		Concentration Level	Collection Date	Concentration Level	Collection Date	Concentration Level	Collection Date
1010	Barium	-	-	-	-	0.32 MG/L	9/16/2019
1040	Nitrate	0.80 MG/L	9/20/2022	0.72 MG/L	9/20/2022	0.70 MG/L	9/8/2020
1045	Selenium	-	-	0.002 MG/L	9/16/2019	-	-
1052	Sodium	8 MG/L	11/12/2019	6.0 MG/L	11/12/2019	4.0 MG/L	11/12/2019
4002	Gross Alpha Incl. Radon & U	7.8 PCI/L	11/28/2016	0.27 MG/L	9/16/2019	2.1 PC/L	11/19/2019
4010	Combined Radium (-226 & -228)	0.1 PCI/L	11/28/2016	-	-	0.3 PC/L	11/19/2019
4020	Radium-226	0.1 PCI/L	11/28/2016	-	-	0.3 PCI/L	9/16/2019

Treated water quality as presented in the Consumer Confidence Reports (CCR) is summarized in **Table 5-4**.

Table 5-4: Consumer Confidence Reports

Regulated Contaminant	MCLG	MCL	2020 Value	2021 Value
Nitrate (ppm)	10	10	0.7	0.68
Gross Alpha (pCi/L)	0	15	2.1	2.1
Radium 226/228 (pCi/L)	0	5	0.3	0.3
Lead (ppb)	0	15	2	1
Copper (ppm)	1.3	1.3	0.073	0.078
Selenium	50	50	2	2
Barium	2	2	0.32	0.32

5.4 Finished Water Storage

5.4.1 Finished Water Storage Summary

The City has a single 1,000,000-gallon circular reinforced concrete storage reservoir constructed in 1996. The reservoir has a diameter of 52.5 feet, a total height of 16 feet, with an overflow at 15.5 feet. Normal operating depth range is between 12.5 feet and 15 feet. The reservoir is accessible through a manway hatch on the roof and reservoir water level is communicated to the system via radio. Storage requirements are detailed in **Table 5-5**. A picture of the top of the reservoir and the surrounding area is shown in **Photo 5-3**.



Photo 5-3: Top of Reservoir

5.4.1.1 Finished Water Storage Component Descriptions

IDAPA 58.01.08 defines the required components of storage as follows:

1. Operational storage (OS)
2. Equalization storage (ES)
3. Standby storage (SS)
4. Fire suppression storage (FSS)
5. Dead storage (DS)

Analyses of each storage component are provided in the following sections.

5.4.1.2 Operational Storage

Operational storage is defined as the volume of the reservoir dedicated to supplying the system under normal operating conditions. This portion of storage is the volume that leaves the reservoir when the wells are not operating and is typically set by the system operator. Operational storage prevents excessive pump and motor on/off cycling while maintaining an adequate volume in reserve to meet peak demand. Operational storage was calculated using 2.5 feet of operating depth.

5.4.1.3 Equalization Storage

Equalization storage supplies the system during periods when demand exceeds available supply. Equalization storage is depleted during peak periods on the diurnal demand curve and is replenished during off-peak hours. Equalization storage requirements were calculated using the IDEQ guidance document, "Guidance for Determining Equalization Water Storage for Public Water Systems". Due to the large amount of available water supply compared to MDD the recommended minimum equalization storage is less than 14,000 gallons.

$$\frac{Q_s}{Q_{mxdy}} = 1.68$$

Therefore, per Table 1 in the IDEQ guidance document:

$$S_{req} = 0.1 \times \frac{Q_{mxdy}}{24} = 13,740 \text{ gallons}$$

Where:

S_{req} = Required volume of equalization storage, gallons

Q_{mxdy} = Peak Hour demand, gallons per day

Q_s = Supply Capacity, gallons per day

5.4.1.4 Standby Storage

Standby storage provides a small level of redundancy to buffer a water system against running out of water due to operational problems or maintenance that results in a source of supply being taken offline for a short period of time. Standby storage is typically used as a substitute for standby power generation at the sources of supply. The flow from the springs is sufficient to meet ADD, therefore no standby storage is required.

5.4.1.5 Fire Suppression Storage

Fire suppression storage is used to meet demand associated with firefighting and is required in public water systems where the source of supply is unable to meet fire flow requirements as set by the local Fire Marshal. The State of Idaho has adopted the 2015 International Fire Code Standards. Based on fire code and construction types, the fire suppression storage requirement for the City is 2,500 gallons per minute for 2 hours, or 300,000 gallons.

5.4.1.6 Dead Storage

Dead storage is storage unavailable for use, for example cannot be used due to the piping of the reservoir, or that provides substandard system pressure, less than 40 psi. The PWS operator reports that there are areas of town that drop below 40 psi when the water surface level in the reservoir drops below 11 feet.

However, in the area identified there are several areas that should have pressures of 50 psi when the tank is empty. It is expected that there is a closed or inoperable valve responsible for this mismatch in expected and found values. This is further discussed in **Section 5.6**.

Table 5-5: Storage Requirements

Component of Storage	Volume (gal)
Operational Storage ¹	162,400
Equalization Storage	14,000
Standby Storage ²	
Fire Suppression Storage	300,000
Dead Storage	714,400
Total	1,190,800

Notes:

1. Operational depth is assumed to be 2.5 feet
2. Spring Collection system able to meet ADD

Limitations

- 70% of the tank is allocated to dead storage.

Recommendations

- Map pressure throughout the system.
- Dedicated transmission main to the Strahorn Booster Station.
- Further investigate and define low pressure areas.

5.5 Booster Pumping Facilities

The City has a single booster pump facility, the Strahorn Booster Station. The Strahorn Booster Station serves the Strahorn Development. Phase One of the development is 47 residential connections. At full buildout, the development is planned to have approximately 200 connections. Currently the system consists of two 15 horsepower pumps, with space for two additional pumps that will be installed during Phase 2 of construction (**Photo 5-4**). The booster station operates based on the pressure of the development. The current pumps are equipped with variable frequency drives. In addition, the booster station is equipped with standby power. A schematic of the booster station is presented in **Figure 5-6**, IDEQ approved plans are in **Appendix G**. Operator reports that the booster station regularly alarms and faults for low pressure on the suction of the pumps. Design summary of the phases of the booster station is presented in **Table 5-6**. Design demands of the booster station are presented in **Table 5-7**.



Photo 5-4: Strahorn Booster Station

Table 5-6: Strahorn Booster Station Summary Table

Phase	Number	Horsepower	Pressure (psi)	Flow (gpm)	VFD	Inlet / Outlet Dia.
1	2	15	40	368	Yes	4-inch
Full Buildout	2	30	40	368	Yes	6-inch

Table 5-7: Strahorn Booster Station Design Demands

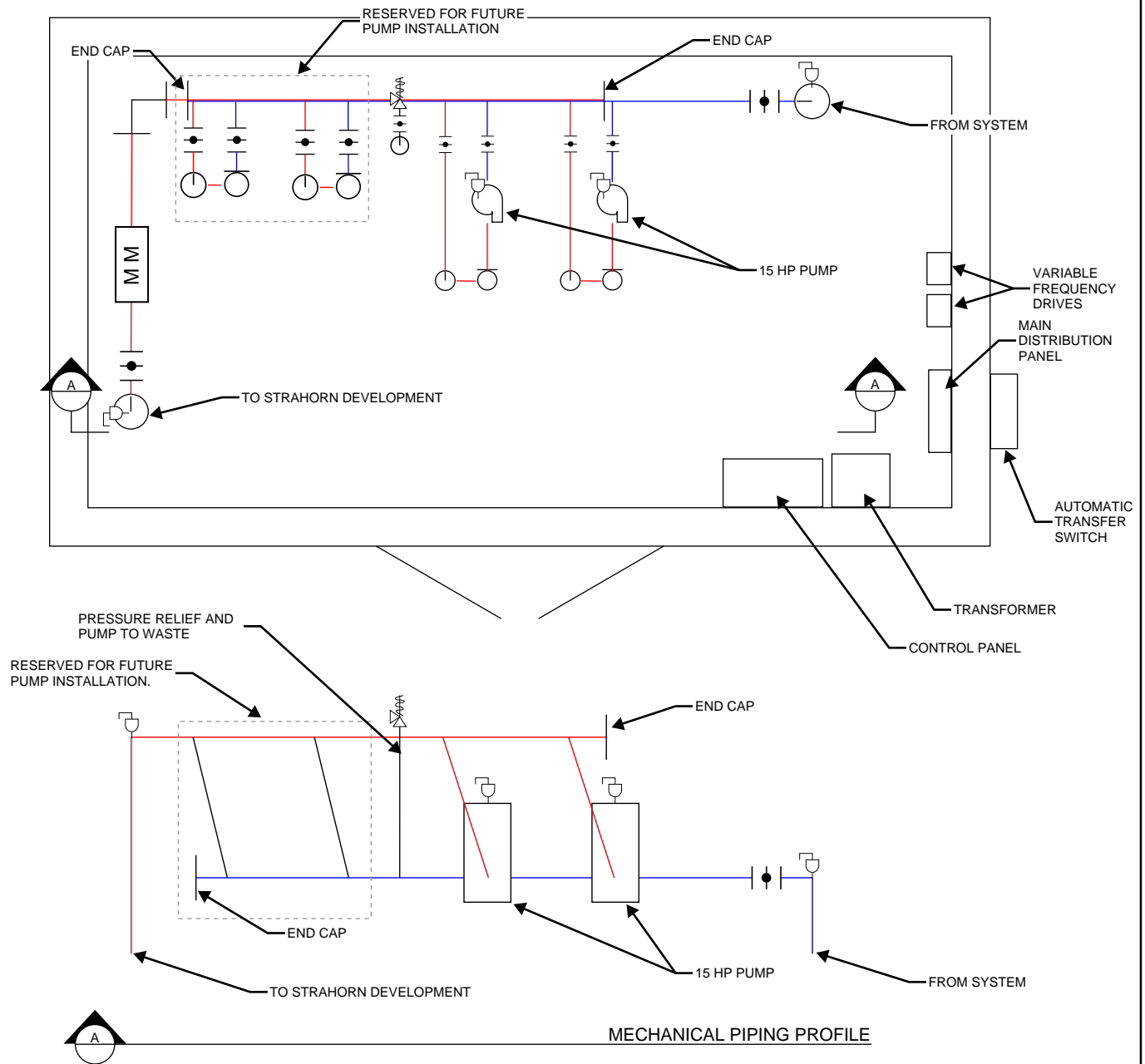
Phase	ADD (gpm)	MDD (gpm)	PHD (gpm)	Fire Flow (gpm)
Phase 1	12	78	156	1,500
Full Buildout	105	305	615	1,500

Limitations









- Booster Station regularly faults due to low suction pressure.

Recommendations

- Install dedicated transmission main to booster station.



LEGEND:

-  AIR RELIEF VALVE
-  PRESSURE RELIEF VALVE
-  MAGNETIC FLOW METER
-  BUTTERFLY VALVE
-  90° ELBOW INTO PAGE
-  90° ELBOW OUT OF PAGE
-  HIGH PRESSURE
-  LOW PRESSURE



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STRAHORN BOOSTER STATION

CITY OF BELLEVE WATER FACILITY PLAN

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 FIGURE 5-6

5.6 Transmission and Distribution

5.6.1 Seamans Creek Transmission Main

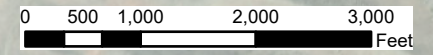
The Seamans Creek Transmission Main was constructed in the 1900s. The exact location of the transmission main is largely unknown, although it is believed to be constructed as shown in the 1982 water permit, see **Appendix H**. The approximate three-mile transmission main is believed to be 12-inch corrugated metal pipe for the entirety of its length. The assumed alignment of the existing transmission main is presented in **Figure 5-7**.

Limitations

- Transmission main is beyond service life.
- Location of the transmission main is unknown.
- Traverses private property without recorded easement(s).

Recommendations

- Abandon and reconstruct transmission main within the Muldoon Canyon Road right-of-way.
- Secure and record all necessary easements.



Legend

- ⊙ Wells
 - ⊕ Water Reservoir
- Pipe Size**
- Diameter (in)
- 2
 - 4
 - 6
 - 8
 - 10
 - 12
 - 14
- ▭ Parcels
 - ▭ Spring Collection System



Maxar

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Water Facility Plan - Existing Springs Transmission Main

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287.0020

City of Bellevue, Idaho

SHEET NO.:
FIGURE 5-7

5.6.2 Distribution Network

A map of the distribution system is presented in **Figure 5-8**. The distribution system is primarily looped, 8-inch, PVC pipe. The trunk lines are 10-inches to 14-inches in diameter. There are areas of 6-inch and smaller pipe, but these are typically within the 8-inch looped area. Notably, the 4-inch main on the south side of Highway 75. The system has sufficient isolation valves and fire hydrants throughout the service area. However, many of these valves and hydrants have not been serviced and actuated recently.

Furthermore, the operators have encountered several valves that were left closed or where the distribution system did not match the record drawings. For example, pipes that were shown to connect in a tee, instead ended in a cap and not connect.

The distribution network as shown in the record drawings was modeled using WaterCAD and analyzed for fire flow capacity. Based on the results from the model, there are no fire flow capacity concerns. WaterCAD results are shown in **Figure 5-9**.

5.6.2.1 System Pressures

With the exception of the area served by the Strahorn Booster Station, the system is pressurized by the water surface in the storage reservoir. There are two areas in the system that have pressures outside of the 40 to 80 psi range, the southwest side where pressures exceed 80 psi and the east where pressures drop below 40 psi depending on water surface level within the reservoir.

5.6.2.2 Service Lines and Meters

Based on presently available information it is believed that many of the service lines may be constructed of lead materials. The service connections are not fully metered, and those that are metered are not regularly recorded.

Radio read service meters are being installed in an ongoing project at the time of this report, with completion expected in late 2023.

Limitations

- Water distribution main along Highway 75 is 4-inch in diameter.
- Undersized mains are in the system.
- Unrecognized leaks are expected.
- Valves and hydrants have not been actuated or serviced.
- Lead service lines are present in the system.
- Area of high and low pressure.

Recommendations

- Replace 4-inch main along Highway 75.
- Actuate and service all valves and hydrants.
- Complete a lead service line inventory.
- Leak detection and prioritization project.
- Install PRV to reduce pressure in the southwest.

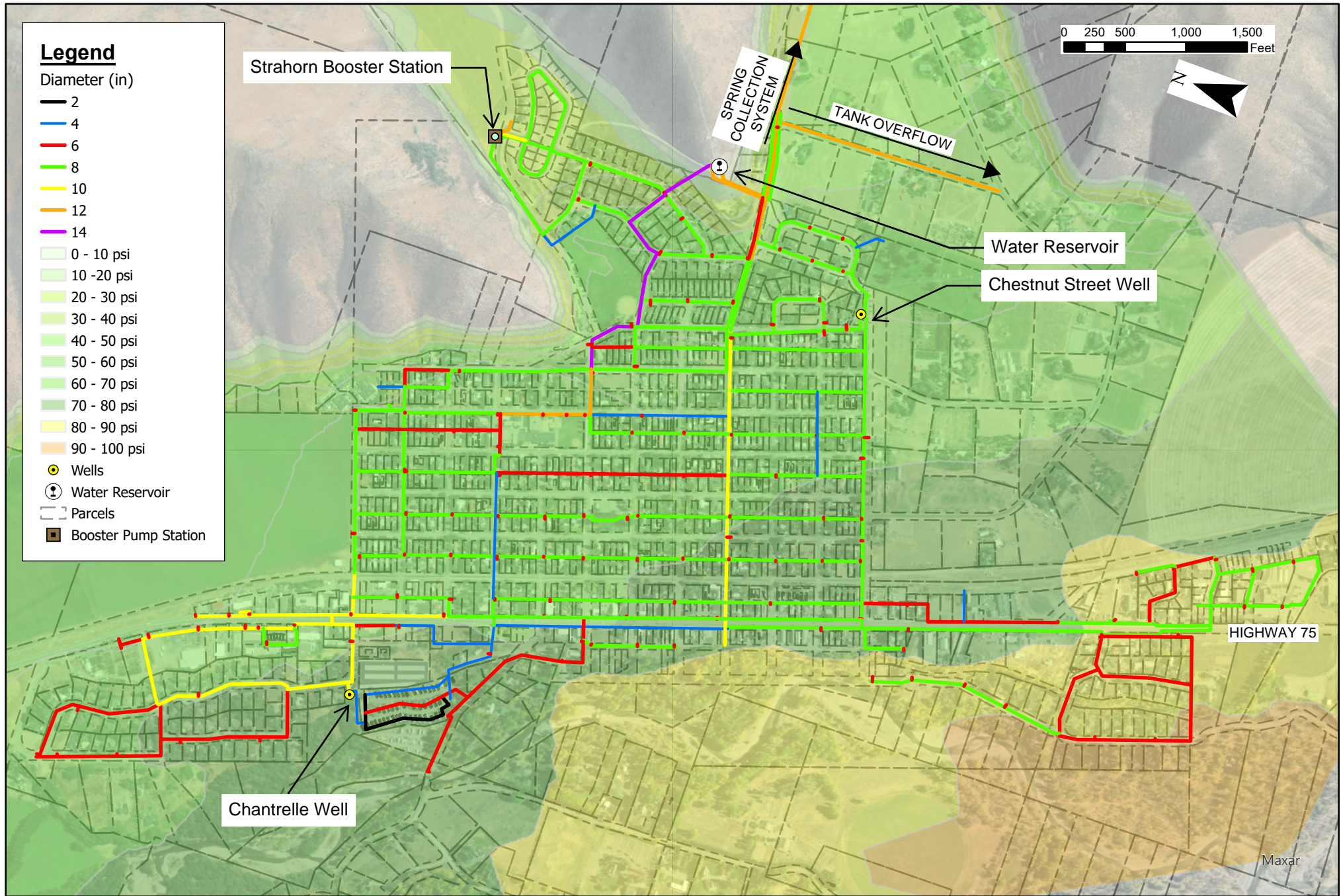
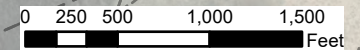
Legend

Diameter (in)

- 2
- 4
- 6
- 8
- 10
- 12
- 14

- 0 - 10 psi
- 10 - 20 psi
- 20 - 30 psi
- 30 - 40 psi
- 40 - 50 psi
- 50 - 60 psi
- 60 - 70 psi
- 70 - 80 psi
- 80 - 90 psi
- 90 - 100 psi

- Wells
- ⊙ Water Reservoir
- ▭ Parcels
- Booster Pump Station



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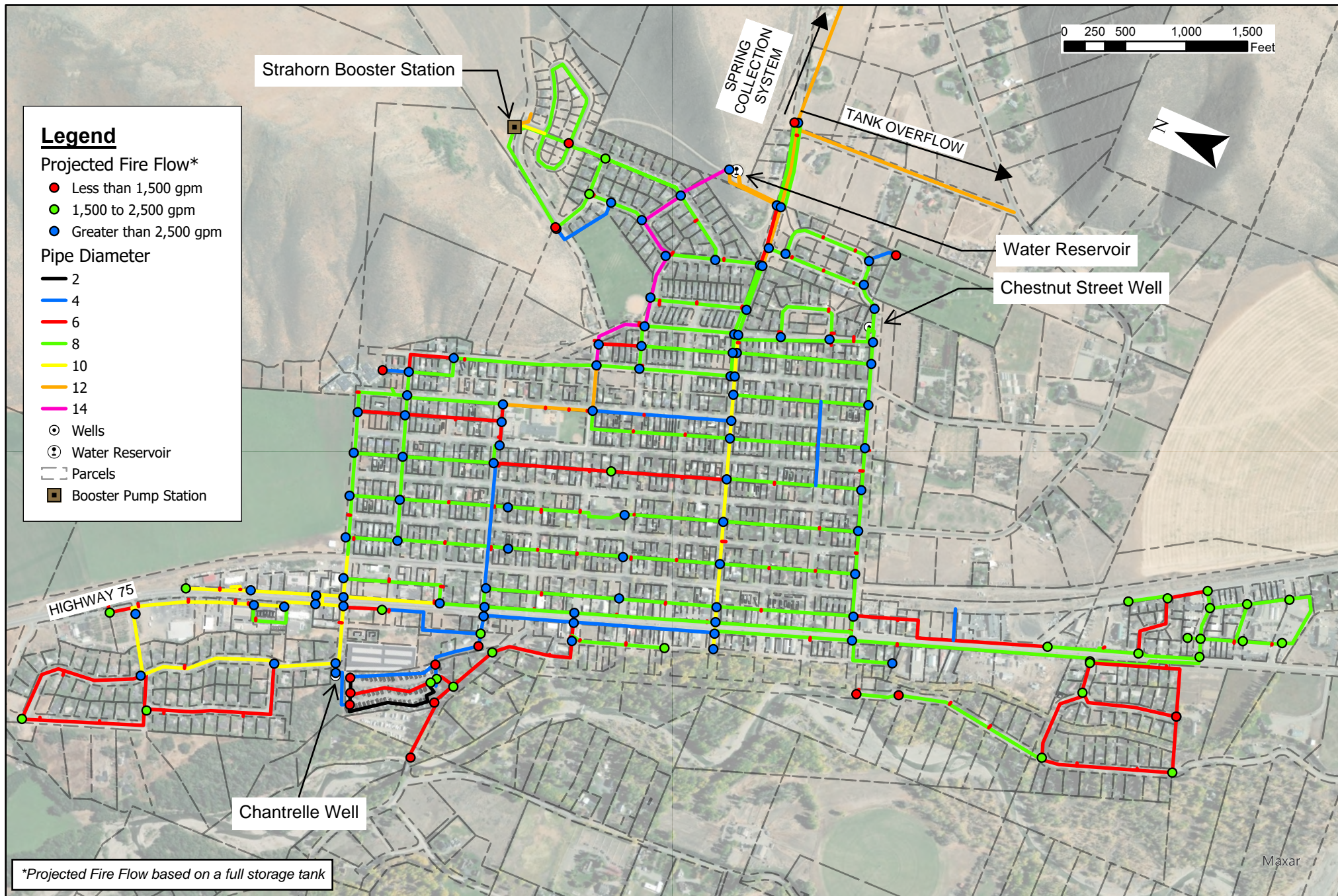
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Water Facility Plan - Water Distribution Map

City of Bellevue, Idaho

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 FIGURE 5-8



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Water Facility Plan - WaterCAD Results

City of Bellevue, Idaho

PROJECT NO.:
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 FIGURE 5-9

5.7 Communication and Control

The City has a supervisory control and data acquisition (SCADA) system for its water infrastructure, but it is currently unused and out of date. The wells are connected to the water storage reservoir via radio. The well pumps are turned on and off based on water level in the reservoir. The level in the reservoir controls all three water sources. The springs system fills the reservoir through an altitude valve that opens and closes at 14.7 feet and 15 feet, respectively. The Chantrelle Well turns on at 13 feet, and the Chestnut Street Well turns on at 12.5 feet; both wells turn off at 14 feet.

Limitations

- SCADA system is out of date and unused.
- Flowmeters on water sources are inaccurate.

Recommendations

- Update and reinstall SCADA system. Including:
 - Flowmeters on all water sources
 - Level sensor in the reservoir
 - New communication equipment
 - Updated PLCs
 - Updated HMIs
 - Monitoring and recording equipment
 - Updated software

5.8 Wastewater Facilities

The City collects and treats its wastewater at a membrane bioreactor wastewater treatment facility. The wastewater treatment facility discharges to rapid infiltration basins in the winter and land applies on a nearby plot during warmer months. The rapid infiltrations basins and land application are currently reported to be in compliance. The wastewater treatment facility does not have any impact on the water system.

5.9 Land and Easements

The City owns the land where the water storage reservoir and both wells are constructed. The City does not own or have verifiable easements on the land including and surrounding the Seamans Creek Spring Collection system and transmission main and spring overflow.

Limitations

- Lack of verifiable land ownership or easements for the spring sources, overflows, and transmission main(s).

Recommendations

- Secure land or easements for all city infrastructure.

SECTION 6

FUTURE CONDITIONS

This section provides estimates of future population growth that may be reasonably anticipated in the community, provides a water demand forecast for the planning period, and establishes design demands used in the development of capital improvement projects.

6.1 Growth Potential and Estimates

Ensuring parity between population analyses presented here and in the 2023 WWFP, the population growth estimates provided in the 2023 WWFP were adopted. The 20-year design population estimate is 4,632, or 1930 EDUs.

Table 6-1: Future Customer and EDU Growth Forecasting

Location	Existing	20-Year Buildout
Population	2,684	4,632
EDUs	1,125	1,930

6.2 Customer Demand Forecasting

Current system per EDU demands are higher than typical values. These demands are expected to decrease throughout the design period as the City installs service meters, repairs leaks, and replaces flow measurement infrastructure. Until future demands can be accurately measured it is conservative to plan around the existing per EDU demands. Therefore, demands per EDU are assumed to not change over the design period but should be evaluated as improvements are made. Future design demands are presented in **Table 6-2**.

Table 6-2. Future Water System Design Demands

Parameter	Flow (gpd/EDU)	Flow (gpd)	Flow (gpm)	Peaking Factor
Average Day Demand	1,030	1,989,000	1,381	1.0
Maximum Day Demand	2,934	5,663,000	3,933	2.8
Peak Hour Demand	4,122	7,955,000	5,524	4.0

6.3 Water Supply

Based on growth projections, the existing water supply will likely lack redundancy, and it is projected the wells would need to operate simultaneously through the summer. As the population and subsequent demand increases, that lack of sources and redundancy only grows. Water source and redundancy requirements are presented in **Table 6-3**.

Table 6-3: Water Supply with Future Demands

System Operation	Source Capacity	Maximum Day Demand	Surplus - (Deficit) ⁴
	(gpm)	(gpm)	(gpm)
Current Sources			
All Sources Operational	3,850	3,933	(83)
Largest Source Out of Service (firm capacity)	2,350	3,933	(1,583)
Additional Well			
All Sources Operational	5,350	3,933	1,417
Largest Source Out of Service ¹	3,850	3,933	(201)

Note:

1. New well equivalent to the Chantrelle Groundwater Well (1,500 gpm).

Based on MDD, the PWS will be outside of firm capacity before 2025. These conditions only hold at current per EDU demands. If the City is able to lower and document MDD through water conservation programs and leak repair, these timings may be delayed or avoided all together. If another 1,500 gpm well is added the system will exceed firm capacity around 2044 (**Figure 6-1**).

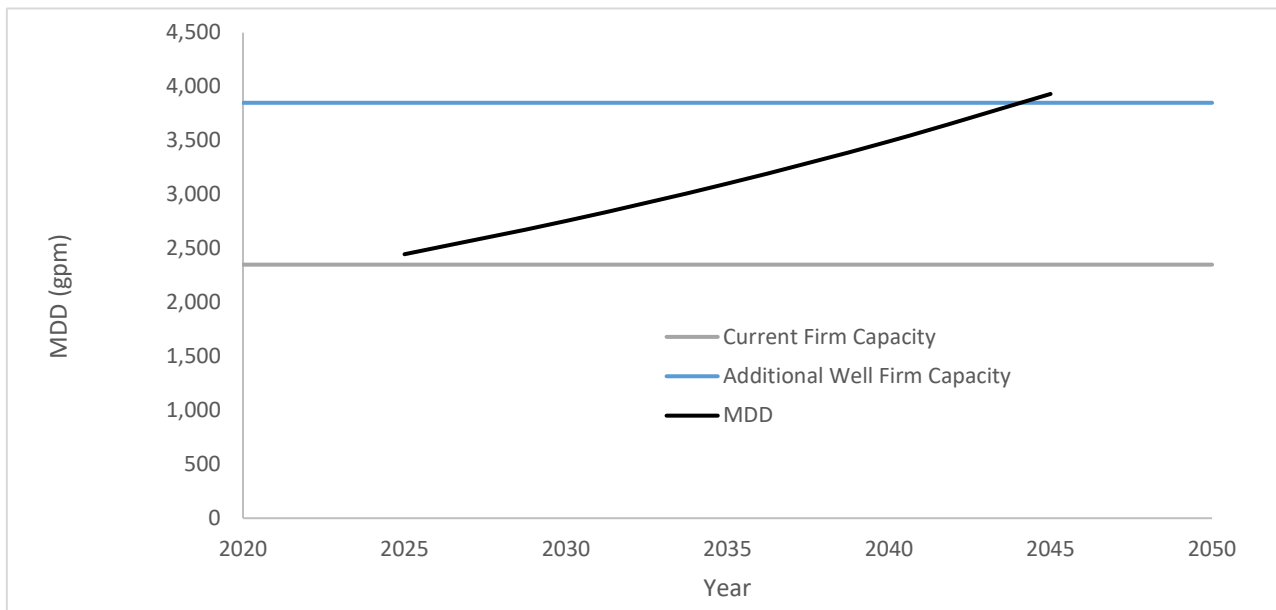
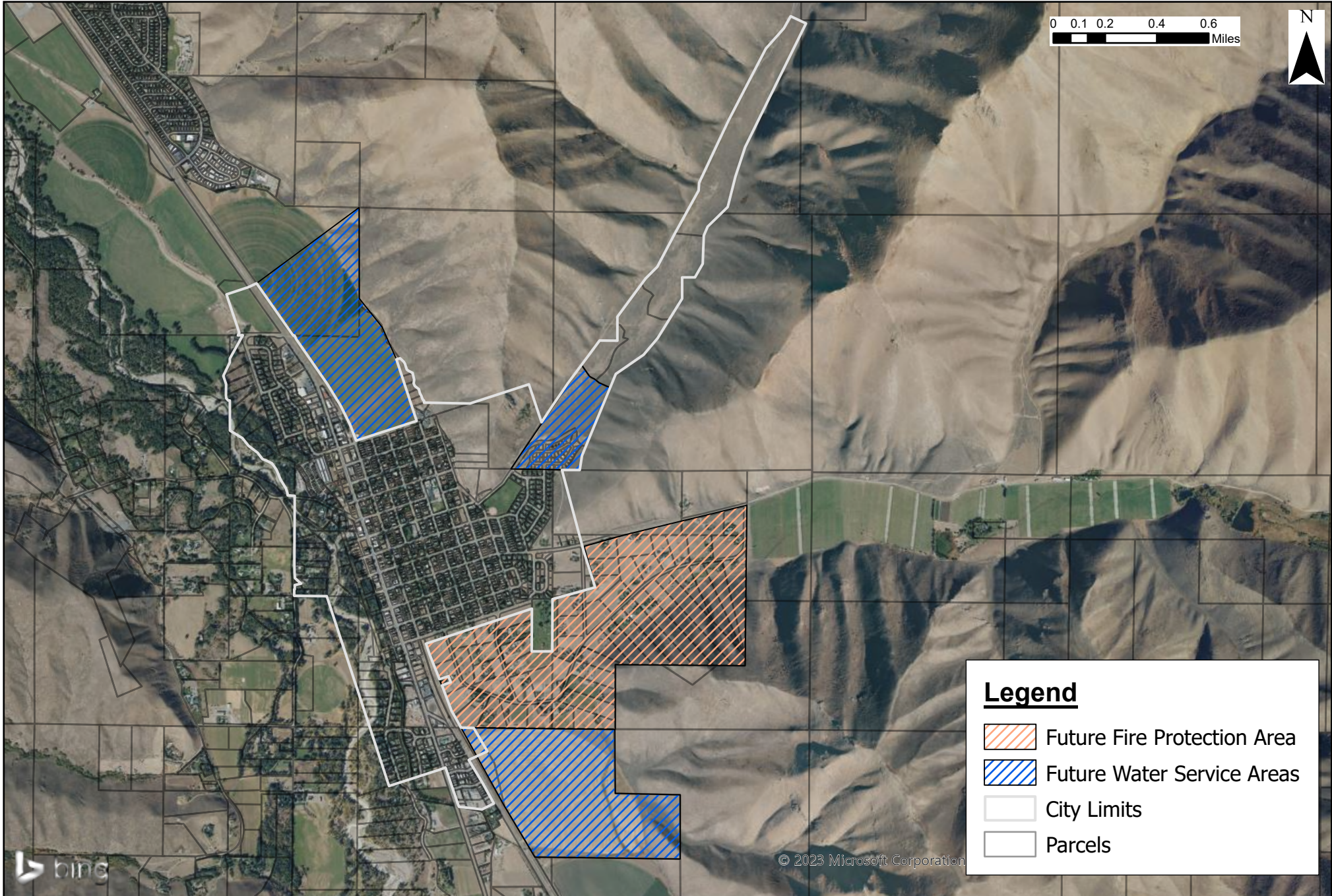






Figure 6-1: Water Source Capacity through Design Period

The City has approximately 4,048 gpm total in water rights currently. Sufficient to match the future MDD and firm capacity, but insufficient to operate all future water sources simultaneously. Water rights in the Big Wood River Management Area are fully allocated.


Areas outside the current city limits that will likely need to be provided with water in the future, including that for residential/commercial use and for fire protection, have been identified and are shown in **Figure 6-2**.



Legend

-  Future Fire Protection Area
-  Future Water Service Areas
-  City Limits
-  Parcels

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Future Water Service Areas

City of Bellevue, Idaho

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FIGURE 6-2

6.4 Future Storage

System storage requirements are presented in **Table 6-4**. As the City grows, additional storage in the system may be required. The increase in storage is primarily due to the increase in equalization storage. If a new water source is added to the system, the recommended equalization storage is roughly 285,000 gallons. If no new supply is constructed, recommended equalization storage is 1,275,000 gallons. Fixing leaks in the system and subsequently lowering demands will also lower the recommended equalization storage. It is recommended that the dead storage component in the existing conditions is addressed and does not carry into future development. If the dead storage component is addressed, the deficit is reduced from 976,800 gallons to 262,400 gallons.

Additional storage can be added as the system expands and may be a requirement of annexation or development. It is recommended that the standby storage component be met with backup power on all groundwater wells.

Table 6-4: Future Storage Requirements

Component of Storage	Volume (gal)
Operational Storage	162,400
Equalization Storage	800,000
Standby Storage	-
Fire Suppression Storage	300,000
Dead Storage	714,400
Future Total	1,976,800
Current Storage	1,000,000
Future Deficit	976,800

6.5 Booster Pumping Facilities

No additional booster pumping facilities are expected as the City expands. The Strahorn Booster Station will expand as part of the phased development of the Strahorn subdivision. Per the IDEQ approved plans (**Appendix G**), the two current booster pumps each have a design flow of 368 gpm. The system will be to meet peak hour demand through 100 EDUs; booster station demands by EDU are shown in **Table 6-5**. The booster station is constructed such to allow for the ready expansion of the capacity by adding additional pumps. Planned peak hour demand is 615 gpm, which is capacity for 185 EDUs at the more conservative Strahorn PHD demand, and 215 EDUs at Design PHD. As there is no planned storage as part of this development, PHD must be supplied by the booster station which in turn may limit max buildout of the development.

Table 6-5: Strahorn Design Demands by EDU comparison

Strahorn Design Values (gpm/EDU)		EDUs			
		50 (gpm)	100 (gpm)	150 (gpm)	200 (gpm)
ADD	0.26	13.0	26.0	39.0	52.0
MDD	1.66	83.0	166.0	249.0	332.0
PHD	3.31	165.5	331.0	496.5	662.0
Water Facility Plan Design Demands (gpm/EDU)		EDUs			
		50 (gpm)	100 (gpm)	150 (gpm)	200 (gpm)
ADD	0.72	35.8	71.6	107.3	143.1
MDD	2.04	101.9	203.7	305.6	407.5
PHD	2.86	143.1	286.2	429.3	572.4

6.6 Transmission and Distribution

As the service area for the PWS expands, increasing distribution capacity to serve these developments will likely be required. Some existing distribution pipe will need to be replaced with large diameter, 12-inch and larger, to advance sufficient capacity to the annexed areas. These large diameter pipes would be extended from existing large diameter pipe and would be tied back into the existing looped system. As the PWS replaces aging infrastructure and expands the transmission and distribution system will be constructed of suitable materials following industry best management practices. Several recommended transmission and distribution projects are identified in **Section 7.3**.

SECTION 7

PRIMARY PROJECT ALTERNATIVES

None of the alternatives proposed in this section require changes to system classification and operator license requirements.

7.1 Source of Supply

The water supply source alternatives include no action, Big Wood River, consolidation with the City of Hailey through a connection of water distribution systems, Seamans Creek new springs collection system, and a new groundwater well and well facility. An evaluation of the technical and operational benefits and difficulties of each of these alternatives is summarized in **Table 7-1**.

Table 7-1: Source of Supply Alternatives Features, Advantages, and Disadvantages

Water Source Alternative	Additional Features	Advantages	Disadvantages
No Action	None	<ul style="list-style-type: none"> No additional capital expenditures. Primarily gravity-fed system from the springs. 	<ul style="list-style-type: none"> Does not address CAS
Big Wood River	Water rights, river intake, surface water treatment plant, treated water service pump station, transmission main.	<ul style="list-style-type: none"> Diversification in water supply sources 	<ul style="list-style-type: none"> Higher operations and maintenance costs of additional features for labor, pumping, and chemicals. Capital costs of additional features.
Consolidation with the City of Hailey	Booster pump station, transmission main.	<ul style="list-style-type: none"> Diversification in water supply sources. 	<ul style="list-style-type: none"> Needs further investigation into legal, financial, institutional, administrative, and water availability and compatibility issues. Higher operations and maintenance costs of additional features for labor, pumping, and chemicals. Capital costs of additional features
Seamans Creek New Springs Collection System	New spring collection system	<ul style="list-style-type: none"> Compatible with existing groundwater system. 	<ul style="list-style-type: none"> Capital costs of additional features.
New Groundwater Well and Well Facility	Well and Well Facility	<ul style="list-style-type: none"> Compatible with existing groundwater system. 	<ul style="list-style-type: none"> Higher operations and maintenance costs of additional features for labor, pumping, and chemicals. Capital costs of additional features.

Because the Seamans Creek new springs collection system and a new groundwater well and well facility alternatives are compatible with the existing groundwater supply sources, they will be further evaluated in the following sections.

7.1.1 SS-1: Seamans Creek New Springs Collection System

Engineer’s Opinion of Probable Cost: \$1,160,000

This project includes the construction of a new spring collection system. The new collection system would be placed within the same drainage, upstream from the current system. The new spring collection system would consist of buried perforated pipe and connected into a new transmission line (**Section 7.3.1**). The project would also include the construction of a new diversion structure and correcting identified deficiencies in the existing spring system. The diversion structure would be installed at the point where the springs tie together and would consist of a knife gate and overflow structure. The proposed chlorination system would include a flow paced chemical feed pump that ties into the system after the altitude valve, with a mixer in the storage reservoir to ensure adequate contact time for chlorination. Additionally, this project includes the reconstruction of the Lower Springs System, as well as, the demolition of all observation ports, weir boxes, etc. on the Upper Springs System.

Cost of land and easements are broken out separately in LE-1 (**Section 7.5.1**). The cost of replacing the Seaman Creek Springs Transmission Line is included in TD-1 (**Section 7.3.1**).

Alternative Recommendation

Major components of this alternative include the following:

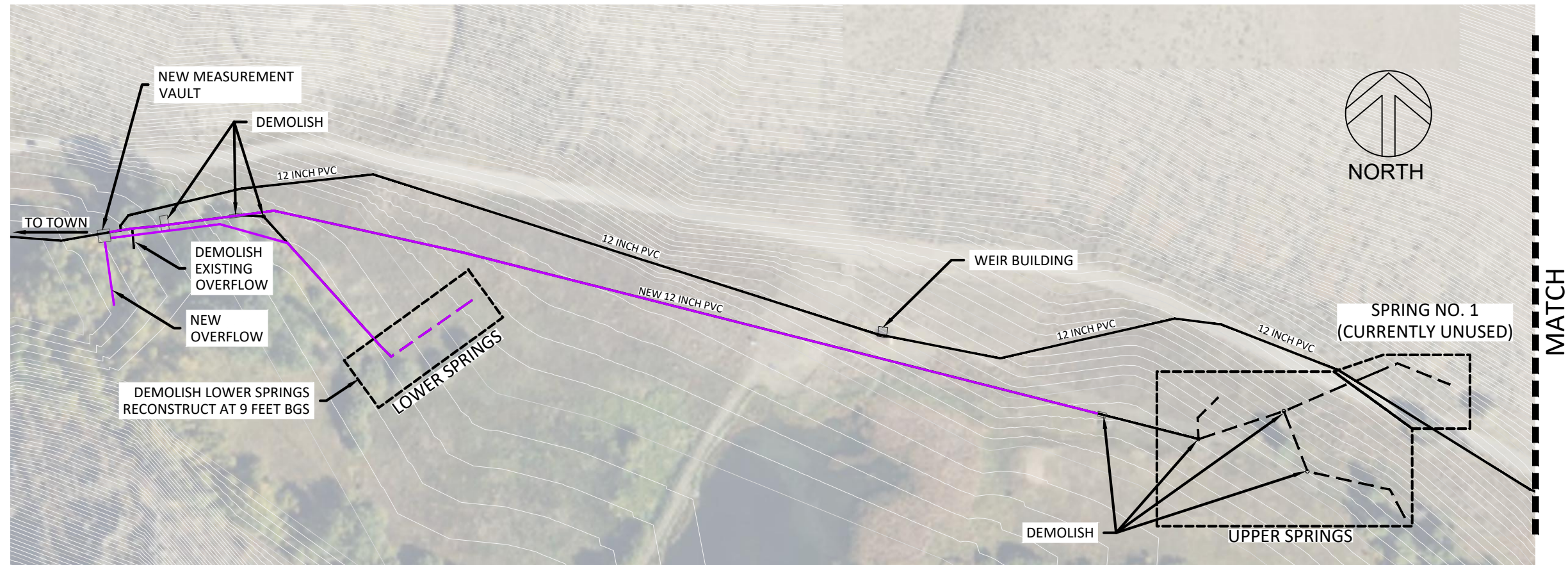
- Construction of spring collection system, approximately 15 feet in depth
- Install 12-inch perforated pipe in an approximate 36-inch bed of drain rock
- Wrap drain rock with nonwoven geotextile.
- Connect groundwater collection to new transmission main.
- Install chlorination and mixing in existing water storage reservoir.
- Maintain dewatering of excavation in portions during construction.
- Reconstruct the Lower Springs at a greater depth
- Replace remaining CMP pipe connecting the Upper Springs System to the rest of the springs.

The location of the new springs collection system is shown in **Figure 7-1**.

A summary of the benefits and constraints associated with this alternative are summarized in **Table 7-2** below.

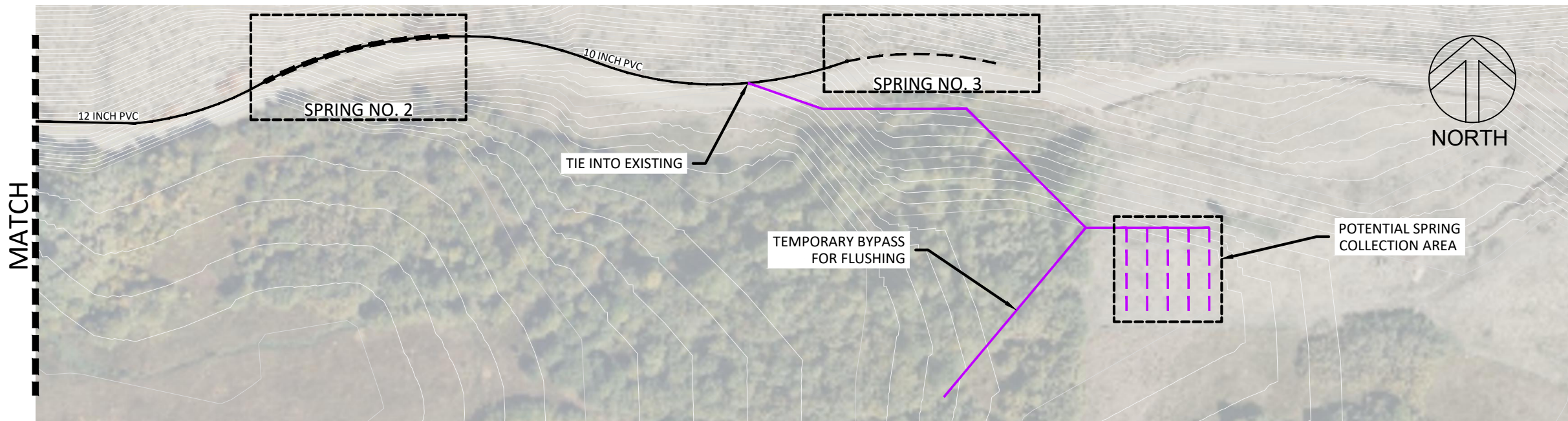
Table 7-2: SS-1 Benefits and Limitations

Benefits	Limitations
<ul style="list-style-type: none"> • Improve Springs Collection System capacity • Reduce possibility of contamination • Increase available water supply • Elimination of aging collection system 	<ul style="list-style-type: none"> • Unknown groundwater and soil conditions • Risk of turbid groundwater due to soil type • Site disruption during construction



1 UPPER & LOWER SPRING COLLECTION IMPROVEMENTS
SCALE: 1" = 150'


- LEGEND**
- PERFORATED PIPE - - - - -
 - EXISTING _____
 - NEW 12-INCH PVC _____



2 NEW SPRINGS COLLECTION AREA
SCALE: 1" = 150'

Path: Q:\Water\Projects\A-D\Bellevue_20170020_DW\FPD\Deliverables\Facility\Plan\Figures\Spring Figures\Spring Figures.dwg File Name: Springs Figures.dwg Plot Date: 10/23/2023 8:47 AM enc.mxd

PROJECT :	282.0020
DATE :	2023/10/17
FIGURE NO. :	FIG 7-1


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**FIGURE 7-1: SEAMANS CREEK SPRING
 COLLECTION SYSTEM IMPROVEMENTS**
WATER FACILITY PLAN
 BELLEVUE, IDAHO

7.1.2 SS-2: New Groundwater Well and Well Facility

Engineer’s Opinion of Probable Cost: \$1,950,000

This project includes the cost of drilling a new groundwater well and the construction of a corresponding well facility. For budgeting and planning purposes, the well and facility will be based on the Chantrelle Well and Facility. As the City expands this project could be a condition of annexation, however, it is presented here in the event that the City elects to pursue this project on its own. It is assumed the City would have a suitable site for well construction available.

Alternative Recommendation

Major components of this alternative include the following:

- Construction of a new well to approximately 250 feet BGS.
- Well includes 50 feet of screen.
- Construction of a new Well Facility with all required appurtenances.
- 150 hp line shaft pump
- Chlorination system

A summary of the benefits and constraints associated with this alternative are summarized in **Table 7-3** below.

Table 7-3: SS-2 Benefits and Limitations

Benefits	Limitations
<ul style="list-style-type: none">• Increased water supply source redundancy• Can be required as a condition of annexation	<ul style="list-style-type: none">• Big Wood River Management Area is fully allocated. Well would be another point of diversion for existing water rights.

7.1.3 SS-3: Generator at Chantrelle Well Facility

Engineer’s Opinion of Probable Cost: \$240,000

This project includes the costs of installing a 120 kW generator at the Chantrelle Well Facility. The project includes the generator, pad, automatic transfer switch, and all relevant appurtenances.

Alternative Recommendation

Major components of this alternative include the following:

- Installation of 120 kw generator
- Construction of pad and sound attenuation
- Installation of automatic transfer switch
- A summary of the benefits and constraints associated with this alternative are summarized in **Table 7-4** below.

Table 7-4: SS-3 Benefits and Limitations

Benefits	Limitations
• Increased capacity in the result of a power outage.	• Additional operations and maintenance requirements.

7.1.4 SS-4: Generator at Chestnut Street Well Facility

Engineer’s Opinion of Probable Cost: \$200,000

This project includes the costs of installing an 80-kW generator at the Chestnut Street Well Facility. The project includes the generator, pad, automatic transfer switch, and all relevant appurtenances.

Alternative Recommendation

Major components of this alternative include the following:

- Installation of 80 kw generator
- Construction of pad and sound attenuation
- Installation of automatic transfer switch
- A summary of the benefits and constraints associated with this alternative are summarized in **Table 7-5** below.

Table 7-5: SS-4 Benefits and Limitations

Benefits	Limitations
• Increased capacity in the result of a power outage.	• Additional operations and maintenance requirements.

7.2 Water Storage

As the City grows, additional development or annexation should include a requirement of additional storage.

7.3 Transmission and Distribution

The following selection criteria should be used to identify areas of the transmission and distribution system for replacement.

- Regulatory compliance
- Reducing system leakage
- Ability to deliver potable water
- Capital cost and rate impact
- Improved water system operations

Given the increasing cost of underground infrastructure projects, it is impractical to satisfy all the aforementioned selection criteria and replace the entire transmission and distribution system at once in a single project. Cities should target a phased approach and outline capital improvement projects that collectively and overtime complete a replacement of the entire transmission and distribution system as needed. To aid in the development of these phased capital improvement projects the following alternatives were developed specific to the planning horizon of this Facility Plan. Each alternative targets the following areas of concern typically associated with transmission and distribution systems.

- **Repair of broken or leaking mains:** Pipe segments that are known to be leaking pose the greatest risk to system integrity and should be the highest priority for replacement.
- **Criticalness:** Pipe breaks on distribution mains that pose the greatest impact to downstream customers and facilities.
- **Pipe age and material:** Older pipe should be prioritized for replacement over newer pipe.

Opinion of probable cost details for the TD alternatives described below are detailed in **Appendix I**.

7.3.1 TD-1: Seamans Creek Springs Collection Transmission Reconstruction

Engineer's Opinion of Probable Cost: \$6,080,000

This project includes the costs of constructing a new water transmission main that will be located within Muldoon Canyon Road. The new transmission main would generally be constructed within the Muldoon Canyon Road right of way with the exception of a section along a private road that would require an easement. The cost of this easement is broken out separately in **Section 7.5**. The pipe alignment and resulting easement is necessary due to the vertical topography of Muldoon Canyon Road, as the transmission main is gravity fed, it must maintain a steadily downhill pipe slope and the existing roadway vertical alignment precludes this. The transmission main will be chlorinated to achieve 4-log virus removal, due to site constraints, chlorination will require an additional easement along Muldoon Canyon Road to house a small building to house chlorination infrastructure. Chlorine calculations can be found in **Appendix J**. To achieve the required contact time, the chlorination building should be sited a minimum of 1,600 feet up the canyon from the new transmission main tie in point. This project will also include a booster station and 2-inch distribution line to provide water to the few services near the springs.

Alternative Recommendation

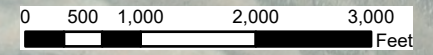
Major components of this alternative include the following:

- Construction of approximately 16,000 feet of 16-inch HDPE transmission main.
- Abandonment of existing transmission main.
- Installation of combination air valves.
- Chlorination.

Table 7-6: TD-1 Benefits and Limitations

Benefits	Limitations
<ul style="list-style-type: none">• Reduce leaks in system.• Transmission main in a known and accessible location• New transmission main is constructed of a resilient material	<ul style="list-style-type: none">• Completion requires additional easements.

A preliminary alignment of the new Seamans Creek Springs transmission main is shown in **Figure 7-2**.




Legend

- Spring Transmission Easement (LE-1)
- Proposed Spring Transmission Main (TD-1)
- ⊙ Water Reservoir
- Spring Collection System
- Elevation Contours
- Proposed Springs Area (SS-1)



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SEAMANS SPRING COLLECTION SYSTEM PROPOSED PROJECTS

CITY OF BELLEVUE WATER FACILITY PLAN

PROJECT NO.:
287.0020

SHEET NO.:
FIGURE 7-2

7.3.2 TD-2: Highway 75 Watermain Improvements

Phase 1 - Engineer's Opinion of Probable Cost: \$800,000

Phase 2 - Engineer's Opinion of Probable Cost: \$1,220,000

This project includes the cost of replacing the watermain along Highway 75 between Spruce Street and Pine Street with 12-inch polyethylene wrapped ductile iron pipe with nitrile gaskets. As this watermain lies within the highway right of way, the pipe diameter was chosen to be oversized to prevent any capacity constraints within the material life of the pipe. This project also includes the replacement of the watermain crossing the highway at Cedar Street and Birch Street. As this distribution main lies within the highway, this project will be phased to line up with timing of Idaho Transportation Department improvements along Highway 75 through town. Phase 1 will occur when the highway is expanded between Birch Street and Spruce Street. The TD-2 alternative is illustrated in **Figure 7-3**. This project assumes that ITD will cover surface restoration, and that the service connections will be up to and not including the meters.

Alternative Recommendations

Major components of Phase 1 of this alternative include the following:

- Replace approximately 1,250 feet of undersized main with 12-inch water main.
- Replace approximately 10 service connections.
- Install 6 gate valves, from 4 inch to 12 inch in size.
- Abandon existing mains in place.
- Connect to existing, 4 connections.












Major components of Phase 2 of this alternative include the following:

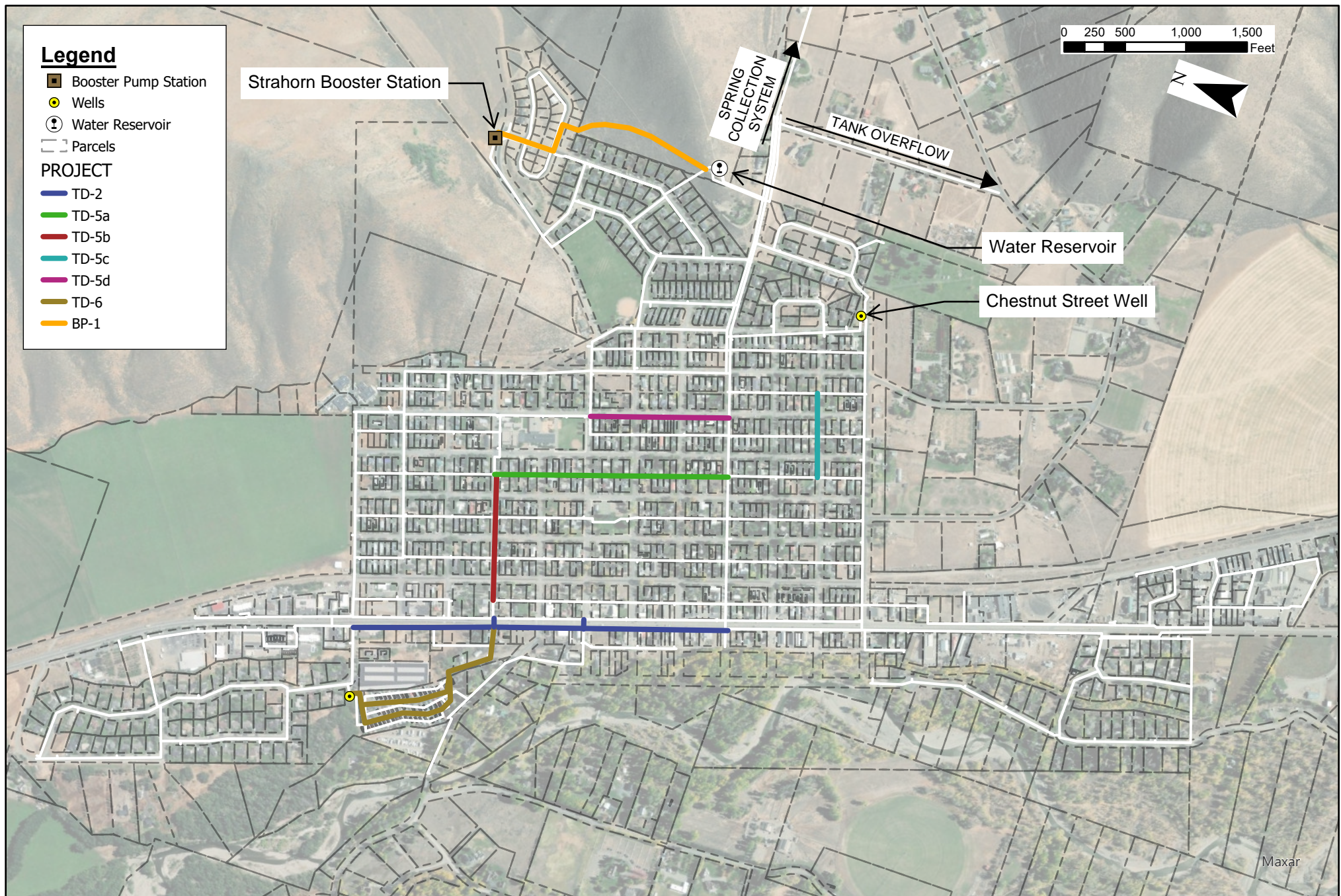
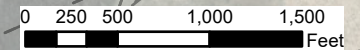
- Replace approximately 2,000 feet of undersized main with 12-inch polyethylene wrapped ductile iron water main.
- Replace approximately 20 service connections.
- Install 10 gate valves, from 4 inch to 12 inch in size.
- Abandon existing mains in place.
- Connect to existing, 4 connections.

Table 7-7: TD-2 Benefits and Limitations

Benefits	Limitations
<ul style="list-style-type: none"> • Reduce leaks in system • Remove undersized main • Improved hydraulic capacity 	<ul style="list-style-type: none"> • Completion dependent on Idaho Transportation Department

Legend

-  Booster Pump Station
 -  Wells
 -  Water Reservoir
 -  Parcels
- PROJECT**
-  TD-2
 -  TD-5a
 -  TD-5b
 -  TD-5c
 -  TD-5d
 -  TD-6
 -  BP-1



Maxar

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Water Facility Plan - Distribution Projects

City of Bellevue, Idaho

PROJECT NO.:
 287.0020

SHEET NO.:
 FIGURE 7-3

7.3.3 TD-3: Distribution System Investigation

Engineer's Opinion of Probable Cost: \$500,000

TD-3 includes the cost of testing fire flow and pressure at representative locations throughout the distribution system and conducting a leak detection survey across system areas most likely to leak. Due to the high amount of unaccounted water, it is recommended that a leak detection survey be conducted across the distribution system. The focus of this project is to increase information resolution that can be used to target subsequent investigative potholing and prioritize leak repair.

Table 7-8: TD-3 Benefits and Limitations

Benefits	Limitations
<ul style="list-style-type: none">Assess distribution system.Identify leaks in high priority areas.Method to prioritize limited funds	<ul style="list-style-type: none">Only targets specific areas, not system wide

7.3.4 TD-4: High Priority Leak Repair

Engineer's Opinion of Probable Cost: \$830,000

TD-4 project includes the cost of exposing and repairing the leaks identified as part of TD-3. As the precise nature of these leaks and locations is not known. For planning and budgeting purposes it was assumed that 1,500 feet of water line would be replaced with minimum 8-inch PVC, service meters, and valves. Once system-wide leak detection has been accomplished, more specific details regarding extent of repair can be provided.

Table 7-9: TD-4 Benefits and Limitations

Benefits	Limitations
<ul style="list-style-type: none">Reduce leaks in systemReduce system demands and subsequent production	<ul style="list-style-type: none">Difficult to estimate cost and project scope

7.3.5 TD-5: Undersized Main Replacement Project

Engineer's Opinion of Probable Cost: \$3,055,000

There are several areas in town that have undersized mains that should be replaced. In the process of replacing these mains, all relevant service connections, fire hydrants, and valves will also be replaced. There are four areas of Bellevue that this project will focus on:

7.3.5.1 Alley between 4th and 5th and Pine and Birch

Engineer's Opinion of Probable Cost: \$1,090,000

This project includes the costs of replacing the 6-inch main in the alley between 4th and 5th Streets from Birch Street to Pine Street. The existing main will be replaced with 8-inch PVC watermain. The project includes replacing approximately 1,900 feet of existing main, replacing 45 service lines and meters, ten isolation valves, and four hydrant assemblies.

7.3.5.2 Birch Street

Engineer's Opinion of Probable Cost: \$720,000

This project includes the costs of replacing the 4-inch main on Birch Street between the alley between 4th and 5th Street and the alley just east of Highway 75. In total this project will construct 1,050 feet of 8-inch PVC replacing the existing main, replacing 14 isolation valves, and four hydrant assemblies.

7.3.5.3 Walnut Street

Engineer's Opinion of Probable Cost: \$510,000

This project includes the cost of replacing the 4-inch water main that runs along Walnut Street between two alleys, the alley between 6th and 7th Street and the alley between 4th and 5th Street. The project would construct approximately 700 feet of 8-inch water main, replace 10 isolation valves, and three hydrant assemblies.

7.3.5.4 6th Street

Engineer's Opinion of Probable Cost: \$735,000

This project includes the cost of replacing the 4-inch main on 6th Street between Cedar Street and Pine Street.

The TD-5 alternatives are illustrated in **Figure 7-3**.

Alternative Recommendation

Major components of this alternative include the following:

- Replace approximately 4,900 feet of undersized main with 8-inch water main.
- Replace approximately 60 service connections.
- Install 37 gate valves, from 4 inch to 12 inch in size.
- Replacement of 12 fire hydrants
- Abandonment of existing mains in place

Table 7-10: TD-5 Benefits and Limitations

Benefits	Limitations
<ul style="list-style-type: none">• Improve system hydraulic capacity• Replace related appurtenances	<ul style="list-style-type: none">• Project scope based on available data.

7.3.6 TD-6: Forbis Lane Melrose Street

Engineer’s Opinion of Probable Cost: \$1,530,000

This project will replace the 4-inch and 2-inch water mains along Forbis Lane and Melrose Street east of Highway 75. The existing water main also ties into the Chantrelle Well. All existing mains will be replaced with 8” PVC. The TD-6 alternative is illustrated in **Figure 7-3**.

Alternative Recommendation

Major components of this alternative include the following:

- Replace approximately 2,800 feet of undersized main with 8-inch water main.
- Replace approximately 50 service connections.
- Install 10 gate valves, from 4 inch to 12 inch in size.
- Abandon existing mains in place
- Connect to existing, 2 connections.

Table 7-11: TD-6 Benefits and Limitations

Benefits	Limitations
<ul style="list-style-type: none">• Improve system hydraulic capacity• Increased looping in system• Replace related appurtenances	<ul style="list-style-type: none">• Majority of project is on private property• Owner would like to change to single master meter

7.3.7 TD-7: Valve and Hydrants

Engineer’s Opinion of Probable Cost: \$800,000

The distribution system has sufficient isolation valves and hydrants. However, the status of these valves and hydrants is unknown. This project includes the actuation, servicing, and flushing of all valves and hydrants in the distribution system. Additionally, this project includes the cost of replacing five percent of valve clusters and hydrants.

Alternative Recommendation

Major components of this alternative include the following:

- Actuate all valves and hydrants in the system
- Service all hydrants in the system
- Replace all nonfunctioning valves and hydrants

Table 7-12: TD-7 Benefits and Limitations

Benefits	Limitations
<ul style="list-style-type: none">• Improve system isolation.• Improved operations and maintenance	<ul style="list-style-type: none">• Difficult to estimate scope and cost of Project

7.3.8 TD-8: Service Meters and Connections

Engineer’s Opinion of Probable Cost: \$995,000

The City is currently undergoing a project to install and replace meters throughout the service area. The purpose of this project is to ensure that there is sufficient budget available to complete this effort in an era of highly variable project costs. For planning and budgeting, this project consists of installing or replacing meters on a third of the connections in the system.

Alternative Recommendation

Major components of this alternative include the following:

- Replace or install meters on all connections.
- Replace service connection.

Table 7-13: TD-8 Benefits and Limitations

Benefits	Limitations
<ul style="list-style-type: none">• Improved measurement of system demands.• Ability to measure non-revenue water.• System wide leak monitoring.	<ul style="list-style-type: none">• None.

7.4 Booster Pumping

7.4.1 BP-1: Transmission Main to Strahorn Booster Pumping Station

Engineer’s Opinion of Probable Cost: \$720,000

BP-1 will install a dedicated transmission main between the water storage reservoir and the booster station. This project includes the cost of constructing a 12-inch dedicated transmission main between the water storage tank and the Strahorn Booster Station.

Major components of this alternative include the following:

- Install approximately 2,500 feet of 12-inch water transmission main.
- Connect to existing, 2 connections.

The alignment of the new transmission main for BP-1 is shown in **Figure 7-3**.

7.5 Communication and Control

7.5.1 CC-1: Communication and Control Equipment Improvements

Engineer's Opinion of Probable Cost: \$750,000

This project includes the cost of multiple improvements to the communications and control equipment throughout the system. These improvements include:

- Replacing or installing flowmeters with digital read functions on both wells and spring source.
- Install SCADA computer at City Hall and install a display only at the public works building.
- Adding in equipment to measure chlorine levels and usage.
- Adding in system pressure monitoring capability.
- Improving redundancy to system callouts.
- Well water level transducers and transmitters.
- Storage reservoir level transducers and transmitters.

Table 7-14: CC-1 Benefits and Limitations

Benefits	Limitations
<ul style="list-style-type: none"> • Improved data collection and recording. • Centralized monitoring and operation. 	<ul style="list-style-type: none"> • Require annual subscription fees.

7.6 Land and Easements

7.6.1 LE-1: Seamans Creek Springs Land Purchase and Easements

Engineer's Opinion of Probable Cost: \$1,000,000

The City of Bellevue does not currently own the land nor have a permanent easement for the existing springs collection system. Part of the proposed layout of the New Springs Transmission Main, Project TD-1, is along a private road. This project includes the costs of purchasing a permanent easement from the landowner. This project is to purchase the land of the proposed new springs collection system. In addition, this project would also acquire a permanent easement for the Upper Springs System and the portion of Project TD-1 that runs along a private road. The location of the easements for the Seamans Creek Springs is shown in **Figure 7-1**. Land appraisals will be required.

Table 7-15: LE-1 Seamans Creek Springs Land Purchase and Easements

Benefits	Limitations
<ul style="list-style-type: none"> • Secure, perpetual access to critical water infrastructure 	<ul style="list-style-type: none"> • None.

7.7 Asset Management

7.7.1 AM-1: Lead Service Line Inventory

Engineer's Opinion of Probable Cost: \$55,000

The Revised Lead and Copper Rule requires that the City prepare and maintain an inventory of service line materials by October 16, 2024. This project would complete a service line inventory to bring the City into compliance with this requirement. Inventory will be based on asbuilts and existing records. The City currently plans on completing this internally.

Table 7-16: AM-1 Lead Service Line Inventory

Benefits	Limitations
<ul style="list-style-type: none">Compliance with Revised Lead and Copper Rule	<ul style="list-style-type: none">None.

7.7.2 M-2: Asset Management Plan

Engineer's Opinion of Probable Cost: \$100,000

This project will develop a comprehensive asset management plan for the City including a digital map showing all water assets including but not limited to all transmission and distribution pipe, isolation valves, blowoffs, customer meters, hydrants, booster stations, and PRVs.

Table 7-17: AM-2 Asset Management Plan

Benefits	Limitations
<ul style="list-style-type: none">Digital asset mapping and conditionsImproved operations and maintenanceImproved institutional knowledge transfer	<ul style="list-style-type: none">None.

SECTION 8

RECOMMENDED CAPITAL IMPROVEMENT PROJECTS

8.1 Background

Typical life expectancies of a public drinking water system's assets are adjusted based on the characteristics of the system (water quality, environmental conditions, maintenance routines, etc.). In addition to the characteristics of the system, a public drinking water system will also consider how soon the assets will need to be replaced to adequately serve customers (remaining useful life). However, most utilities cannot afford to self-fund system-wide depreciation. Therefore, replacement of major backbone infrastructure is typically funded through long-term financing, (referred to as debt service) as a portion of the customer rate.

Various state and federal agencies have funding available to help finance a portion (and in some cases, most or all) of a community's capital improvement project. These agencies offer funding assistance to communities that have smaller populations, are situated in rural areas throughout Idaho, and typically, have higher customer rates. Agency-based funding can help maintain affordable and comparable (to surrounding communities) user rates. Historically, the following agencies can provide funding for public drinking water system improvements:

- Idaho Department of Environmental Quality
- Idaho Department of Commerce
- USDA Rural Development
- US Army Corp of Engineers

8.2 Project Alternatives Overview

8.2.1 Alternative 1—IDEQ Compliance

\$9,600,000 Total Capital Cost

Alternative 1-IDEQ Compliance addresses deficiencies identified at the Springs Collection System, including replacing the springs transmission main, and several distribution system projects. The project consists of the following components:

- SS-1: Seamans Creek New Springs Collection System.
- TD-1: Seamans Creek Springs Collection Transmission Reconstruction
- TD-2: Highway 75 Watermain Improvements
- TD-3: Leak Detection Project
- LE-1: Seamans Creek Springs Land Purchase and Easements

This project provides the following benefits to the PWS:

- Addresses deficiencies at the Springs Collection System
- Replaces Springs Transmission Main
- Replaces undersized mains along Highway 75
- Identifies high priority leaks in distribution system

8.2.2 Alternative 2—Critical Infrastructure

\$16,660,000 Total Capital Cost

Alternative 2 includes all the alternatives included in Alternative 1 and adds the following alternatives:

- SS-2: New Groundwater Well and Well Facility
- SS-3: Generator at Chantrelle Well Facility
- SS-4: Generator at Chestnut Street Well Facility
- TD-4: High Priority Leak Repair
- TD-5: Undersized Main Replacement Project
- BP-1: Transmission Main to Strahorn Booster Pumping Station
- AM-1: Lead Service Line Inventory

In addition to the benefits provided by Alternative 1, this project provides the following benefits to the PWS:

- Improved redundancy of groundwater well sources
- Standby power at existing groundwater wells
- Repair of all high priority leaks in the system
- Replacement of identified undersized mains throughout the distribution system.

8.2.3 Alternative 3—All Projects

\$22,110,000 Total Capital Cost

Alternative 3-All Projects includes each of the project components presented in Alternatives 1 and 2 and includes the following remaining alternatives:

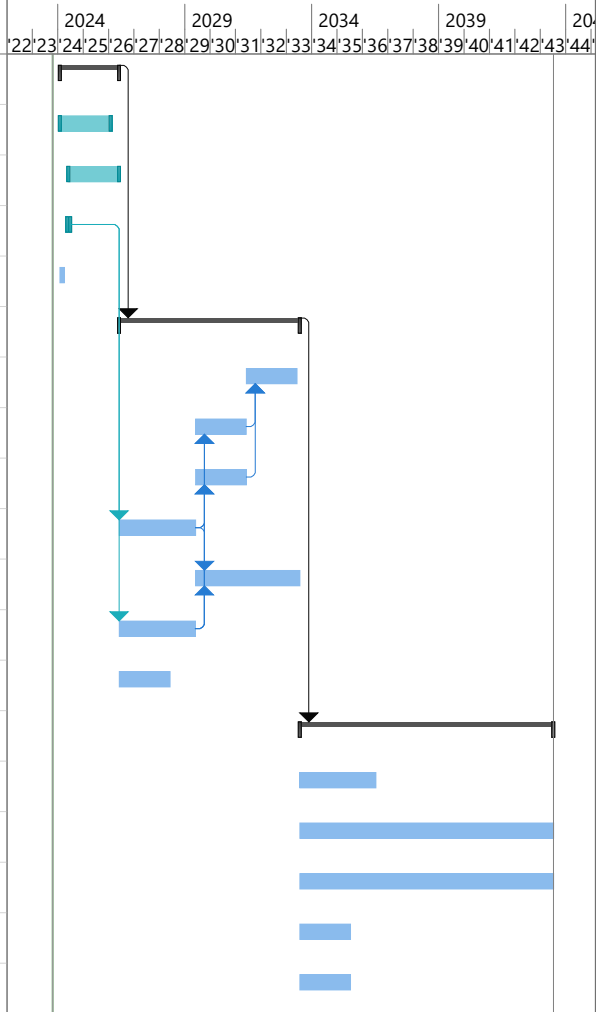
- TD-6: Forbis Lane Melrose Street
- TD-7: Valve and Hydrants
- TD-8: Service meters and connections
- CC-1: Communication and Control Equipment Improvements
- AM-2: Asset Management Plan

In addition to the benefits provided by Alternative 2, this project provides the following benefits to the PWS:

- Additional undersized main replacement
- Distribution isolation improvements
- Installations of meters on the entire service area


The capital improvement plan for these three alternatives is show in **Figure 8-1**. The alternative costs are summarized in **Table 8-1**.

ID	Task Mode	Task Name	Duration	Start	2024	2029	2034	2039	2044
1		Alternative 1 - IDEQ Compliance	609 days	Thu 2/1/24					
2		SS-1 Seamans Creek New Collection System	730 edays	Thu 2/1/24					
3		TD-2: Highway 75 Watermain Improvements	730 edays	Mon 6/3/24					
4		TD-3: Leak Detection Project	30 days	Sat 5/18/24					
5		LE-1: Seamans Creek Springs Land Purchase and Easements	45 days	Thu 2/1/24					
6		Alternative 2 - Critical Infrastructure	1854 days	Wed 6/3/26					
7		SS-2: New Groundwater Well and Well Facility	730 edays	Wed 6/4/31					
8		SS-3: Generator at Chantrelle Well Facility	730 edays	Sun 6/3/29					
9		SS-4: Generator at Chestnut Street Well Facility	731 edays	Sun 6/3/29					
10		TD-4: High Priority Leak Repair	1096 edays	Wed 6/3/26					
11		TD-5: Undersized Main Replacement Project	1500 edays	Sun 6/3/29					
12		BP-1: Transmission Main to Strahorn Booster Pumping Station	1095 edays	Wed 6/3/26					
13		AM-1: Lead Service Line Inventory	730 edays	Wed 6/3/26					
14		Alternative 3 - Remaining Projects	2608 days	Tue 7/12/33					
15		TD-6: Forbis Lane Melrose Street	1095 edays	Tue 7/12/33					
16		TD-7: Valve and Hydrants	3650 edays	Tue 7/12/33					
17		TD-8: Service meters and connections	3650 edays	Tue 7/12/33					
18		CC-1: Communication and Control Equipment Improvements	730 edays	Tue 7/12/33					
19		AM-2: Asset Management Plan	730 edays	Tue 7/12/33					



Project: Water Facility Plan
Date: 10/22/23

Task		Inactive Summary		External Tasks	
Split		Manual Task		External Milestone	
Milestone		Duration-only		Deadline	
Summary		Manual Summary Rollup		Progress	
Project Summary		Manual Summary		Manual Progress	
Inactive Task		Start-only			
Inactive Milestone		Finish-only			



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CAPITAL IMPROVEMENT PLAN

CITY OF BELLEVE WATER FACILITY PLAN

PROJECT NO.:
287.0020

SHEET NO.:
FIGURE 8-1

Table 8-1: Proposed Project Alternatives

Project ID	Project Description	Project Cost	Alternative 1 IDEQ COMPLIANCE	Alternative 2 CRITICAL INFRASTRUCTURE	ALTERNATIVE 3 ALL PROJECTS
	Construction				
SS-1	SS-1 Seamans Creek New Springs Collection System	\$1,160,000	\$1,160,000	\$1,160,000	\$1,160,000
SS-2	New Groundwater Well and Well Facility	\$1,950,000		\$1,950,000	\$1,950,000
SS-3	Generator at Chantrelle Well Facility	\$240,000		\$240,000	\$240,000
SS-4	Generator at Chestnut Well Facility	\$200,000		\$200,000	\$200,000
TD-1	Seamans Creek Springs System Transmission Main	\$6,080,000	\$6,080,000	\$6,080,000	\$6,080,000
TD-2a	Hwy 75 Watermain Improvement Project - Phase 1	\$800,000	\$800,000	\$800,000	\$800,000
TD-2b	Hwy 75 Watermain Improvement Project - Phase 2	\$1,220,000			\$1,220,000
TD-3	Leak Detection Survey	\$500,000	\$500,000	\$500,000	\$500,000
TD-4	Leak Repair Project	\$830,000		\$830,000	\$830,000
TD-5	Undersized Main Replacement	\$3,055,000		\$3,055,000	\$3,055,000
TD-6	Forbis Lane and Melrose Street	\$1,530,000			\$1,530,000
TD-7	Valves and Hydrants	\$800,000			\$800,000
TD-8	Service Meters and Connections	\$995,000			\$995,000
BP-1	Transmission Main to Strahorn Booster Pumping Station	\$720,000		\$720,000	\$720,000
CC-1	Communications and Control Equipment	\$750,000			\$750,000
LE-1	Land Acquisition	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000
AM-1	Lead Line Inventory	\$55,000		\$55,000	\$55,000
AM-2	Asset Management Plan	\$100,000			\$100,000
	Phase Total (Rounded to \$1000)		\$9,540,000	\$16,590,000	\$21,985,000
	Admin/Legal and CWIP				
	Legal Fees--Local Attorney		\$40,000	\$45,000	\$75,000
	AIS, Davis-Bacon Monitoring and Compliance		\$20,000	\$25,000	\$50,000
	Total, Admin/Legal and Interest		\$60,000	\$70,000	\$125,000
	Total Projected Expenditures		\$9,600,000	\$16,660,000	\$22,110,000

8.3 Proposed Funding Package and Rate Impact

In January 2023, Mountain Waterworks worked with the City to submit a Letter of Interest (LOI) package to procure funding from IDEQ for the proposed drinking water improvements. A total amount of \$9.6 million was requested and based on Alternative 1-IDEQ Compliance.

In July 2023, IDEQ published its final Intended Use Plan (IUP) and fundable list based on the LOI submittals, and the City qualified for the proposed funding package that includes a combination of State Revolving Fund (SRF) low-interest loan funds and a Leading Idaho Funds (LIF) grant. Proposed loan terms include 20-years at 2.5% annual interest.

Additional steps will be required from the City to apply for and secure the funding package prior to March 31, 2024. The following table (**Table 8-2**) summarizes IDEQ’s funding offer to the City of Bellevue.

Table 8-2: IDEQ Funding Offer

Funding Source	Loan (\$ million)	Grant (\$ million)	Total (\$ million)
State Revolving Fund (SRF)	\$6.30	N/A	\$6.30
Leading Idaho Funds (LIF) Grant	N/A	\$3.30	\$3.30
Total Funding Offer			\$9.60

Note:

1. 20-year, 2.5% interest terms

If the City were to accept the proposed IDEQ funding offer, which includes a 34% grant and 66% low-interest loan offer, the user rate per active service connection would increase by approximately \$35.58 per month to cover the proposed debt service. Additionally, it is recommended that the City establish a reserve fund and set aside funds to replace short-lived assets.

Proposed user rate impacts are defined in **Table 8-3**. Alternative 1-IDEQ Compliance estimates the rate impact of the proposed IDEQ funding package for each user at the current number of EDUs.

Alternative 2-Critical Infrastructure and Alternative 3-All Projects were estimated assuming the funding package would match the current funding package. Loan conditions were assumed to be the same as those in the proposed IDEQ funding package.

Table 8-3: Funding Alternatives and User Rate Impact

Item No.	Funding Alternatives	Alternative 1 IDEQ Compliance ¹	Alternative 2 Critical Infrastructure	Alternative 3 All Projects
1	Project Estimate	\$9,600,000	\$16,660,000	\$22,110,000
2	Loan	\$6,295,163	\$10,924,731	\$14,498,547
3	Grant	\$3,304,837	\$5,735,269	\$7,611,453
4	Annual Payment	(\$403,817)	(\$700,790)	(\$930,040)
5	Short-lived Asset Annual Cost	(\$9,000)	(\$16,000)	(\$21,000)
6	Debt Monthly Rate Impact per EDU	(\$30.58)	(\$53.10)	(\$70.45)
7	Capital Reserve per EDU	(\$5.00)	(\$5.00)	(\$5.00)
8	Total per EDU	(\$35.58)	(\$58.10)	(\$75.45)

Note:

1. Based on the proposed IDEQ funding package, including a 20-year, 2.5% interest rate.

8.4 Recommended Project Alternative

It is recommended that the City of Bellevue select **Alternative 1—IDEQ Compliance**. This project addresses deficiencies identified in the CAS and sanitary survey, as well as identifies high priority leaks in the distribution system. If construction contingency remains after the completion of the project, it would be allocated to identification and repair of additional leaks.

The user impact of the debt service (2.5% interest, 20 years) is estimated at approximately \$35.58. This would increase the base monthly water rate from \$33.70 to approximately \$70.00.

8.5 Implementation of Facility Plan

The forecasted user rates associated with implementation of the recommendations contained in the Facility Plan in accordance with the schedule shown in **Figure 8-1** are shown in **Table 8-4**.

Table 8-4: Forecasted User Rates

Description	Alternative 1 IDEQ COMPLIANCE	Alternative 2 CRITICAL INFRASTRUCTURE	ALTERNATIVE 3 Remaining Projects
Timeframe	2024 - 2026	2026 - 2033	2033 - 2043
Total Projected Expenditures ³	\$9,600,000	\$7,060,000	\$5,450,000
Forecasted EDU	1125	1528	1930
Grant/Loan ²	34%/66%	34%/66%	34%/66%
Loan ³	\$6,336,000	\$4,659,600	\$3,597,000
Annual Payment ^{1,3}	(\$406,436)	(\$298,900)	(\$230,737)
		(\$406,436)	(\$406,436)
			(\$298,900)
Short Lived Asset Annual Cost ³	(\$9,000)	(\$16,000)	(\$21,000)
Debt Monthly Rate Impact per EDU ³	(\$30.77)	(\$39.34)	(\$41.32)
Capital Reserve per EDU ³	(\$5.00)	(\$5.00)	(\$5.00)
Subtotal per EDU ³	(\$35.77)	(\$44.34)	(\$46.32)
Current Rate per EDU ³	(\$33.70)	(\$33.70)	(\$33.70)
Total Rate per EDU ³	(\$69.47)	(\$78.04)	(\$80.02)

Notes:

1. Loan conditions are 20 years at 2.5% annual interest.
2. Funding package includes 34% grant and 66% loan.
3. All costs and rates are in 2023 dollars.

SECTION 9

SELECTED CAPITAL IMPROVEMENTS

9.1 Public Participation

To be completed after IDEQ Technical Approval

9.2 Selected Alternative

To be completed after IDEQ Technical Approval

SECTION 10

ENVIRONMENTAL CONDITIONS

10.1 Geology

Bellevue, Idaho is a small town located in Blaine County in central Idaho. The town is situated at an elevation of 5,167 feet above sea level and covers an area of approximately 2.5 square miles. The soils in Bellevue are primarily of the loamy sand and sandy loam type, quaternary sedimentary from the Holocene and Pleistocene eras. These soils are well-drained, have a low water-holding capacity, and are relatively low in organic matter. A report and map of the planning area soils generated by the United States Department of Agriculture (USDA) National Resources Conservation Service (NRCS) is included as **Appendix K**.

The planning area is situated in the central part of the Idaho Batholith, which is a massive granite intrusion that extends over an area of approximately 14,000 square miles. The town is also located in the Wood River Valley, which was formed by the erosion of the surrounding mountains by glaciers during the Pleistocene era. The valley is characterized by steep-sided canyons, alluvial fans, and alluvial terraces. The surrounding mountains are composed of various rock formations, including granites, schists, and quartzites. Situated in the Wood River Valley, Bellevue is surrounded by mountains on all sides. The valley is characterized by rolling hills, gentle slopes, and broad alluvial terraces. The mountains surrounding the valley rise steeply to an elevation of over 10,000 feet above sea level. A Geologic Map of Bellevue produced by the United States Geological Survey (USGS) is included as **Appendix L**. A Geologic Map of Seamans Creek is also provided by the United States Geological Survey (USGS) and included in **Appendix L**.

10.2 Surface Water Quantity and Quality

Bellevue, Idaho, is located within the Big Wood River watershed. The Big Wood River is a major tributary of the Snake River and originates in the Sawtooth Mountains of central Idaho. The river flows through the Wood River Valley, including the town of Bellevue, before eventually joining the Snake River near Gooding, Idaho. The Big Wood River watershed covers an area of approximately 1,340 square miles and includes several other tributaries, such as Seamans Creek, East Fork, North Fork, and Warm Springs Creek.

The water quality of the Big Wood River has become a concern in recent years due to high levels of sediment and nutrient pollution. Sediment poses a significant issue in the river, as it can affect water clarity, habitat, and aquatic life. The Idaho Department of Environmental Quality (DEQ) has identified the river as impaired by sediment. Nutrient pollution is another problem, with elevated levels of nitrogen and phosphorus, particularly in agricultural areas.

The amount of water in the Big Wood River varies depending on factors such as precipitation, snowmelt, and groundwater recharge. Water levels can also be influenced by human activities, including irrigation for agricultural purposes and groundwater pumping, which can impact the river's flow and water table. A USGS stream monitoring site at S Broadford Bridge NR in Bellevue indicates a seasonal transition in flow between 6ft and 10ft between 2017 and 2023.

10.3 Groundwater Quantity and Quality

The City is situated in the Wood River Valley and relies on an active spring source and two groundwater wells to provide all of the public drinking water for the community. The Wood River Valley aquifer system primarily consists of Quaternary-age sediment and basalt. This material forms the three components of the aquifer system: a single unconfined aquifer that underlies the entire valley, a deeper confined aquifer located to the south of the city, and a confining layer that separates the two aquifers. The thickness of the confining layer increases towards the south, and as the land surface altitude decreases in the same direction, the water-level surface rises above the land surface, resulting in wells flowing under artesian pressure.

A 2007 report by the United States Geological Survey (USGS) confirmed statistically significant declining trends in mean annual water levels in three representative wells, which reflect the general conditions in the aquifer system. (**Appendix M**).

The city received no water violations in recent years. A recently completed Microscopic Particulate Analysis (MPA) test indicated high water quality with low primary and secondary particulate abundance. Reference **Appendix F** for analysis results.

10.3.1 Sole Source Aquifer

The planning area is not located in any designated sole source aquifers. The planning area is within the EPA designated Eastern Snake River Plain Aquifer Source Area.

10.4 Public Health and Water Quality Considerations

Public health is not anticipated to be negatively impacted by the proposed alternatives. The project will improve the quality of treatment at the surface water treatment facilities, water storage, and water distribution and transmission to the Bellevue community.

10.5 Flora and Fauna

The U.S. Fish and Wildlife Service's (USFWS) online Information for Planning and Conservation (IPaC) tool was used to develop an official species list, which is included in (**Appendix N**).

The IPaC species list identified the following fauna may be within the project boundary:

- Monarch Butterfly (listed as Candidate)
- North American Wolverine (listed as Proposed & Threatened)

The report indicates there are no flora species or proposed critical habitats within the project area.

A species of migratory birds that may be found within the project area are listed as Birds of Conservation Concern or warrant special attention due to the Bald and Golden Eagle Protection Act. These include the following species:

- American White Pelican
- Bald Eagle
- Black Rosy-finch
- California Gull
- Cassin's Finch
- Evening Grosbeak
- Golden Eagle
- Lewis's Woodpecker
- Rufous Hummingbird
- Safe Thrasher

Any mitigation requested by agencies will be included in the project to reduce the potential impacts to local flora and fauna.

10.6 Land Use, Agricultural Lands and Residential Development

The planning area considered for the water system upgrades is located within the The City of Bellevue Community limits. Land use within the planning boundary is classified as "city" by the Blaine County. Land use outside of the planning boundary is predominately agriculture-residential or rural-residential. Zoning Districts map provided in **Appendix O**. The selected alternatives will not significantly impact the planning area and land use. Proposed alternatives will be designed to meet regulatory requirements associated with land use.

10.7 Cultural Resources

The Bellevue Historic District is a remnant of the original commercial and residential areas of the town of Bellevue. The National Register of Historic Places identifies twenty-four buildings within the district chiefly date from the 1880s, when the town experienced a boom, although some, including the Bellevue State Bank, were erected after the turn of the century. The bulk of the district is residential; however, five brick and concrete commercial structures (buildings 1 through 5) and a frame barn (building 8) are included. The documented period of significance is between 1880-1910, with an area significance on architecture. Listed below are the registered inventory of Historic Places. National Register of Historic Places Inventory-Nomination Form can be found in **Appendix P**.

1. C. P. Larsen Building – Main Street
2. Davis and Bouschers Saloon (Drake Antique)
3. Bellevue State Bank – Main Street
4. I.O.O.F. Hall – Main Street
5. I.O.O.F. Hall – Main Street
6. One-story cinderblock building – Main Street
7. N.C. Larsen House – Second Street
8. N.C. Larsen Barn – Barn
9. Dr. Allen House – Second Street
10. House – South Corner Oak and Second Street
11. Log House – Second Street
12. House – Second Street
13. House – Second Street
14. House – Second Street
15. House – Second Street
16. Johnson House – Oak Street
17. House – Second Street
18. House – Second Street
19. House – North Corner of Pine and Second Streets
20. Log House – Third Street
21. McNary House – Oak Street
22. House – Third Street
23. House (bungalow) – 203 Third Street
24. House – Fourth Street

The proposed or alternate actions is not anticipated to disturb or adversely affect cultural or historic resources. Prior to construction, an environmental review will be conducted.

10.8 Flood Plains

The Federal Emergency Management Agency (FEMA) shows the Bellevue community as being an area of minimal flood hazard (Zone X). See **Appendix Q** for FEMA's associated flood map.

10.9 Wetlands

A Wetlands Inventory map from the USFWS National Wetlands Inventory online tool is provided as **Appendix R** and indicates that riverine features such as freshwater emergent wetland, forested/shrub wetland, and freshwater pond are present within the community. The proposed projects are not anticipated to disturb any riverine areas.

10.10 Wild and Scenic Rivers

No wild or scenic rivers are within or near the planning area.

10.11 Climate

Bellevue, ID experiences a continental climate characterized by warm summers and cold winters. At an elevation of approximately 5,200 feet it receives moderate precipitation, mostly in the form of snow during winter. During the summer months of June, July, and August, the average high temperatures range from the mid-70s to low 80s Fahrenheit, while the average lows range from the mid-40s to low 50s Fahrenheit. Winter conditions have average highs in the mid-30s to low 40s Fahrenheit, and average lows dipping into the teens to low 20s Fahrenheit. December and January are the coldest and snowiest months, with average snowfall ranging from 10 to 20 inches. Spring and fall seasons receive moderate amounts of rainfall, while summer tends to be drier.

Table 10-1: 1991-2020 Average Monthly Precipitation, Snowfall, and Temperature

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Precipitation (In)	2.06	1.50	1.41	1.11	2.07	1.29	0.61	0.71	0.84	1.75	1.73	2.44	17.52
Temperature (°F)	25.4	28.5	37.6	46.8	54.3	61.9	70.8	69.3	60.4	47.7	34.8	25.4	46.9

10.12 Air Quality and Noise

The planning area is not in an area of concern for air quality as regulated by the Idaho Department of Environmental Quality (IDEQ). The rural location of the planning area lends itself to relatively quiet noise levels. Typical regular noise is mostly generated from normal highway and street traffic.

10.13 Energy Production and Consumption

The City of Bellevue power is supplied by the Idaho Power Company. Energy consumption is anticipated to increase because of the proposed project. However, all equipment installed will be energy efficient limiting the overall impact of the systems energy consumption. Additionally, reduction in energy consumption is anticipated as distribution main line leaks will be eliminated, resulting in reduced system demands. During the preliminary engineering phase, opportunities to select high efficiency equipment should be assessed to determine whether the payback from reduced operation and maintenance costs outweigh the associated higher capital costs. If the payback period resulting from improved energy efficiency is less than the useful life of the equipment, the higher efficiency option should be selected.

10.14 Socioeconomic Profile and Population

The current American Community Survey estimates the median household income of Bellevue as \$71,154 with approximately 5.8% percent of families living below poverty level. The racial and ethnic characteristics of Bellevue are reported as predominately white with approximately 32% percent reporting as Hispanic and 67% White. The population of families living below the poverty rate is relatively low. The proposed construction project will not unfairly impact any socioeconomic class.

10.15 Green Infrastructure/Sustainability

Funding provided to support preparation of this Facility Plan required that sustainability measures be addressed in conformance with Idaho Administrative Procedures Act (IDAPA) Code 58.01.04.020.02(f). To such an end, appropriate recommendations will be developed herein to reduce energy usage, extend the life and utilization of capital assets, achieve water conservation (as appropriate), and generally achieve environmental innovations. Recommendations will also consider energy-efficient opportunities such as advanced fluorescent lighting, high-efficiency discharge lighting, and lighting controls. VFDs will be evaluated for use in all pumping applications. High-efficiency motors will be prioritized for use in all relevant applications. Trenchless or low-impact construction technologies will be evaluated for use in all pipe replacement projects.

An asset management software program such as the Environmental Protection Agency's (EPA) Check Up Program for Small Systems (CUPSS) should be evaluated for use in tracking the maintenance and capital needs of the wastewater facilities.

The City utilizes a consumption-based system to monitor and charge customers for water used. The City is committed to managing and maintaining this system to provide reliable water usage information. The City is also committed to having a rate structure which fully supports the independent operation of the water utility.

A SCADA system was evaluated for the control and automation of the groundwater wells. The well pumps are currently controlled by a programmable logic controller (PLC) and radios. Due to the small size of the water system, the limited process components, and the relatively simple operational needs, an advanced SCADA system was not found to be practical.

All new sources of supply will implement source water protection measures to prevent contamination. New sources will fully comply with current IDAPA 58.01.08 rules and regulations. The City evaluated becoming an EPA Green Power partner and found that the community does not use green power in amounts that meet EPA minimum usage requirements. The City of Bellevue will have a professional energy audit performed by Idaho Power and intends to implement their findings as part of the Capital Improvement Plan. Residuals are currently not generated by the water system and there are not plans for the system to generate residuals.

SECTION 11

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