CITY OF GLENNS FERRY

Water System Facilities Plan

IDEQ Planning Grant #DWG-132-2012-13

December 2014

Technically APPROVED for public comment
IDAHO DEQ
Boise Regional Office
By:
Date: Jan-22-2015

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Project No. 10-12-007

PROFESSIONAL ENGINEER REGISTERED 13152 STATE OF IDAHO TREVOR R. LINDLEY
Dec. 5, 2014

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CITY OF GLENNS FERRY
WATER SYSTEM MASTER PLAN

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Chapter 1

Introduction

1.0 INTRODUCTION

1.1 PURPOSE AND NEED OF THE STUDY

The City of Glenns Ferry owns and operates a drinking water treatment, storage, and distribution system that provides service to the community. The water system consists of a drinking water treatment plant (WTP) that treats water from the Snake River, a single storage tank, and a distribution system consisting of water mains ranging from 4-inches to 14-inches in diameter.

This Facilities Plan will aid the City of Glenns Ferry in identifying existing deficiencies and alternatives to upgrade their current water supply, treatment, distribution, and storage facilities as necessary through the 40-year planning period for the distribution system, and the 20-year planning period for all other components. The City has been dedicated to providing its users with high quality drinking water while keeping user rates affordable. This report is needed to prepare for growth, changing regulations, to improve fire flows, and enhance the system operations.

This Facilities Plan evaluates the following:

1. Current population and demand growth rate, and current and future water use patterns.
2. A comparison of the demand versus the current and future available water supply.
3. The ability of the distribution system to provide both adequate service and fire protection flow rates.
4. The capacity and condition of the existing water storage and distribution facilities.
5. The current water treatment facilities and their ability to meet the current and future standards of the Idaho Department of Environmental Quality (IDEQ) and the Environmental Protection Agency (EPA). Also, a capacity and condition assessment of the treatment system.
6. A recommended Capital Improvement Plan (CIP) with required improvements to the supply, distribution, storage and treatment facilities.
7. Approximate user costs for the proposed improvements.

1.2 REPORT ORGANIZATION

The report is organized into seven chapters based on the IDEQ Form 5-A Outline and Checklist for Engineering Report/Facility Plan, including:

- Chapter 1 - Introduction
- Chapter 2 – Existing Conditions
- Chapter 3 – Existing Water System
- Chapter 4 – Future Conditions
- Chapter 5 – Water Demand Analysis
- Chapter 6 – Analysis of Existing and Future System
- Chapter 7 – Development and Screening of Improvements
- Chapter 8 – Implementation of Water System Improvements

A further breakdown on the organization of the report is provided in the Table of Contents, Appendices, List of Tables, and List of Figures.

1.3 OPINIONS OF PROBABLE COSTS

The cost estimates contained in this report are in 2014 dollars and appropriate escalation factors should be applied to any projects that are implemented beyond the year 2014.

1.4 PROJECT RESPONSIBILITY

The City of Glenns Ferry has successfully completed the following water system projects:

- replacement of the drinking water reservoir in 1999
- construction of a water treatment plant in 2004
- installation of a fire suppression line using a GEM community grant in 2006
- water line replacements in 2006 and 2007

The listed water projects were funded through multiple agencies as well as municipal bonds.

The City has a record of completing projects and implementing changes as needed to provide required levels of service and to meet regulatory requirements. J-U-B also has 60 years of experience in water/wastewater system planning, design, bidding, and construction and is familiar with the City's drinking water and wastewater systems.

The City of Glenns Ferry acknowledges that work to be performed as a result of this or any other city approved study will require funding and anticipates working with State and Federal agencies for funding through grants, loans, and combinations of available funding. The City can also use cash reserves and can explore private financing options.

The City will adhere to the legal requirements for acquiring, maintaining, safeguarding, and disposing of property, as necessary.

1.5 ENVIRONMENTAL REVIEW

If necessary, an Environmental Information Document (EID) will be prepared separately from this report for the specific improvements identified in the Water System Facilities Plan. The EID will evaluate potential environmental impacts and mitigation measures for the proposed improvements.

Chapter 2

Existing Conditions

2.0 EXISTING CONDITIONS

2.1 PLANNING AREA

Glenns Ferry is located in Elmore County about 26 miles southeast of Mountain Home, 77 miles east of Boise, and 60 miles northwest of Twin Falls. Elmore County is the 5th largest county in Idaho, encompassing more than 3,100 square miles. The 2010 census indicated Glenns Ferry had a population of 1,319.

The Planning Area Vicinity Map is shown in Figure 2-1. The City is adjacent to Interstate 84 and the Snake River. The City falls within the southwest ¼ of Section 28, the south half of Section 29 the southwest ¼ of Section 30 and the north half of Sections 31 and 32.

This Water System Facilities Plan is based on a specific Planning Area which represents a geographical area and population which the City can reasonably be expected to serve within a 40-year and a 20-year design period from 2014 to 2054. Figure 2-2 shows the Planning Area and existing corporate limits for the City of Glenns Ferry. The city boundary contains an area approximately 2.8 miles wide by 1.3 miles long, bordered by Interstate 84 on the north and the Snake River to the south.

Glenns Ferry provides services to the ranching and farming communities and also to Interstate 84 travelers. Most residents work on the surrounding farms and ranches or at local businesses. The city has a relatively mild climate, a rural friendly nature, and a multitude of recreational opportunities.

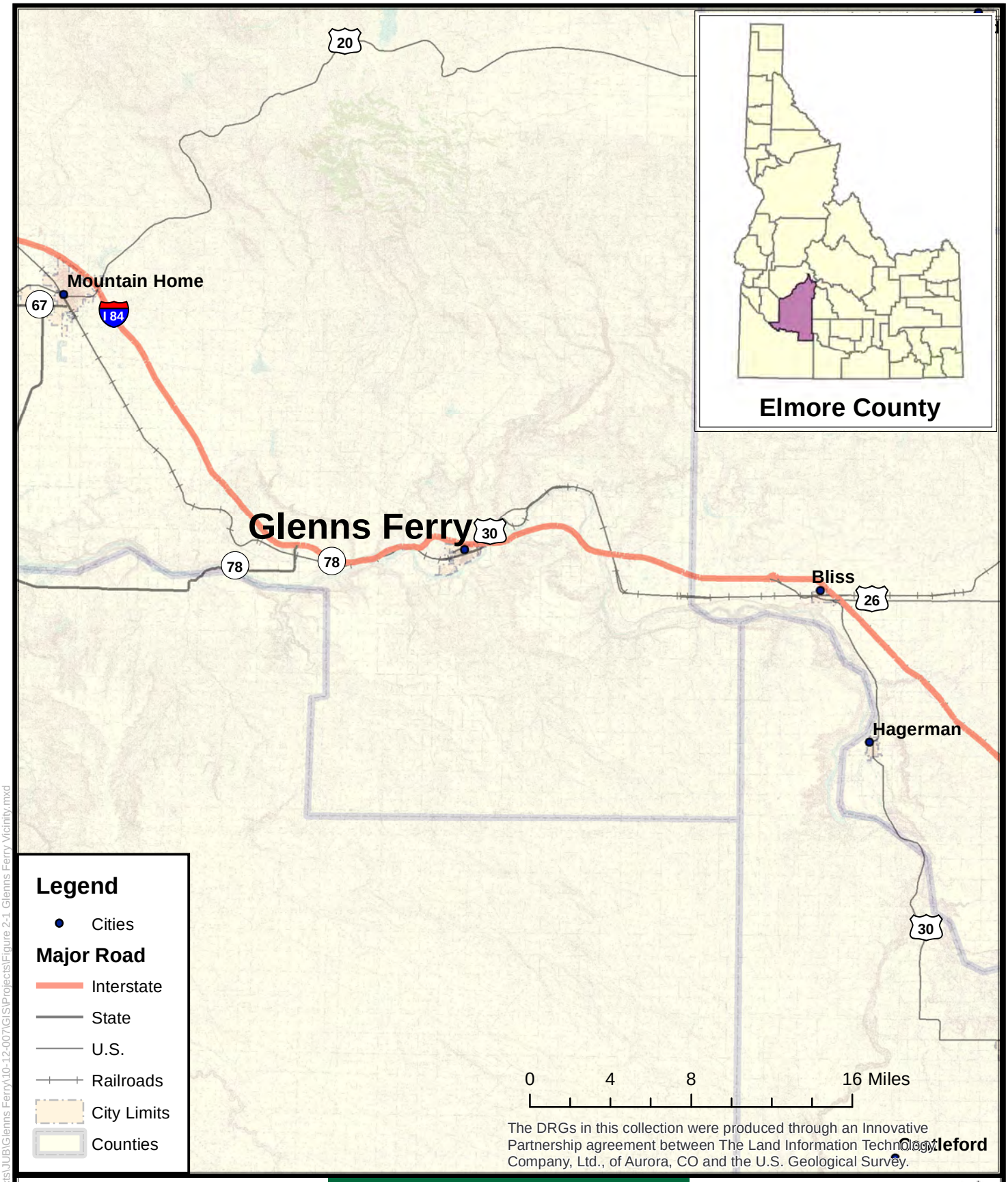
2.2 EXISTING PLANNING AREA CONDITIONS

2.2.1 Physiography, Topography, Geology, and Soils

Glenns Ferry is located in south central Idaho along the Snake River. The City's topography varies throughout the City limits with elevations ranging from approximately 2,500 feet above mean sea level at the Snake River to 2,600 feet above mean sea level along Interstate 84. The City's southwestern portion can be considered flat, the eastern middle area qualifies as rolling hills and the northern portion is hilly. Figure 2-3 shows the topography of the Glenns Ferry Planning Area on a U.S. Geologic Survey (USGS) topographic map.

According to information from Idaho State University, the western Snake River Plain is a north-northwest-trending 10 million year old basin bounded by normal faults. It is filled with thick sequences of basalt lava, sediments of Lake Idaho, and stream deposits derived from the Idaho batholith to the north and the Owyhee Mountains to the south. The thick layers of unconsolidated sediments overlying Miocene-age volcanic rocks distinguish the western Snake River Plain from the eastern Snake River Plain. The western Snake River Plain contains coarse and fine-grained unconsolidated sediment up to 5,000 feet thick. Quaternary basalt is present up to 2,000 feet thick, mainly in the central and eastern parts of the Western Plain.

The geology of the region surrounding Glenns Ferry is illustrated in Figure 2-4. A Natural Resource Conservation Service (NRCS) soil survey map of Glenns Ferry is shown in Figure 2-5.



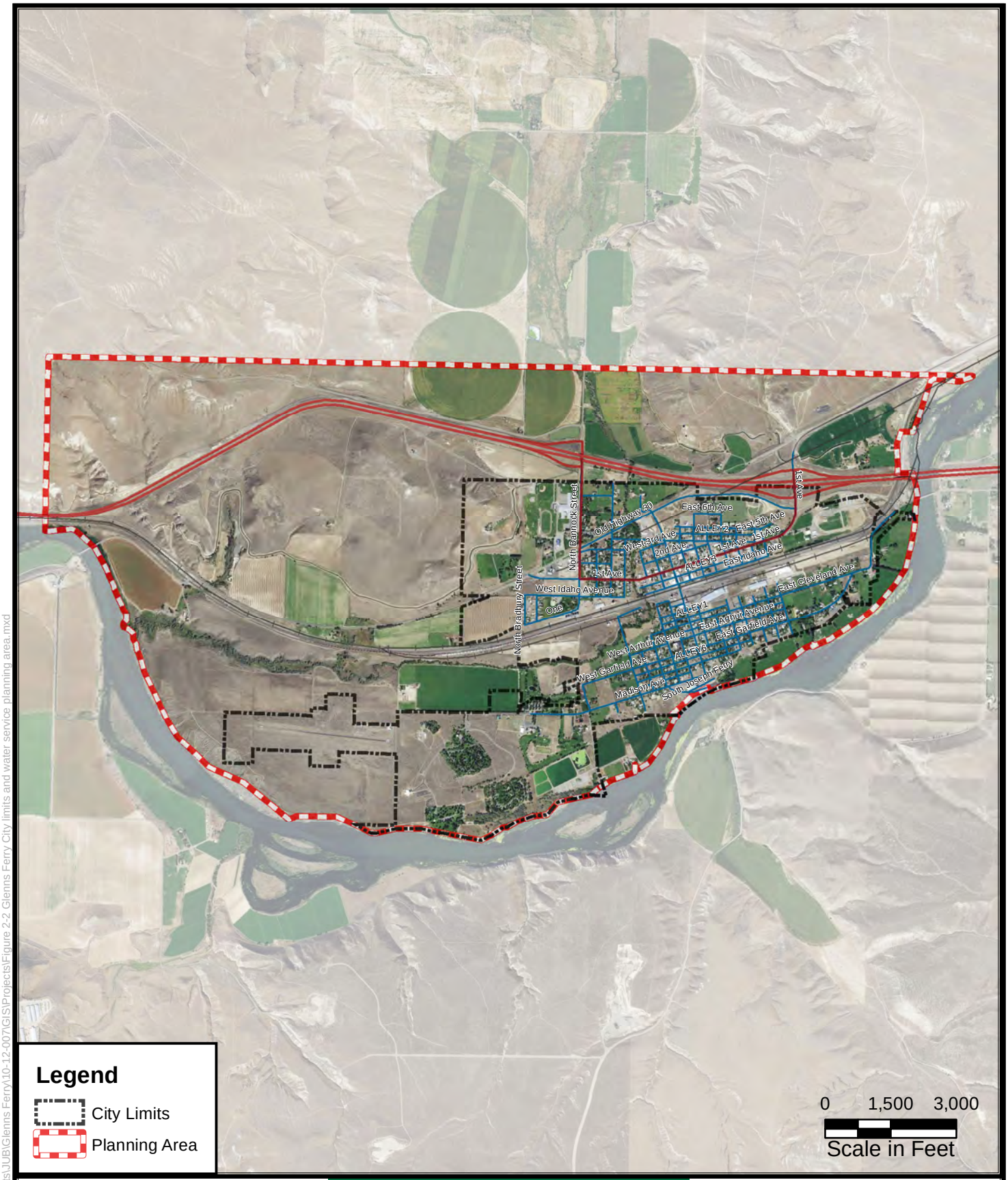
WATER SYSTEM FACILITIES PLAN

FIGURE 2-1

CITY OF GLENNS FERRY PLANNING AREA VICINITY

J-U-B ENGINEERS, INC.

8/25/2014 Path: F:\Projects\JUB\Glenns Ferry\10-12-007\GIS\Projects\Figure 2-1 Glenns Ferry Vicinity.mxd



CITY OF GLENNS FERRY

WATER SYSTEM FACILITIES PLAN

FIGURE 2-2

CITY LIMITS AND WATER SERVICE PLANNING AREA

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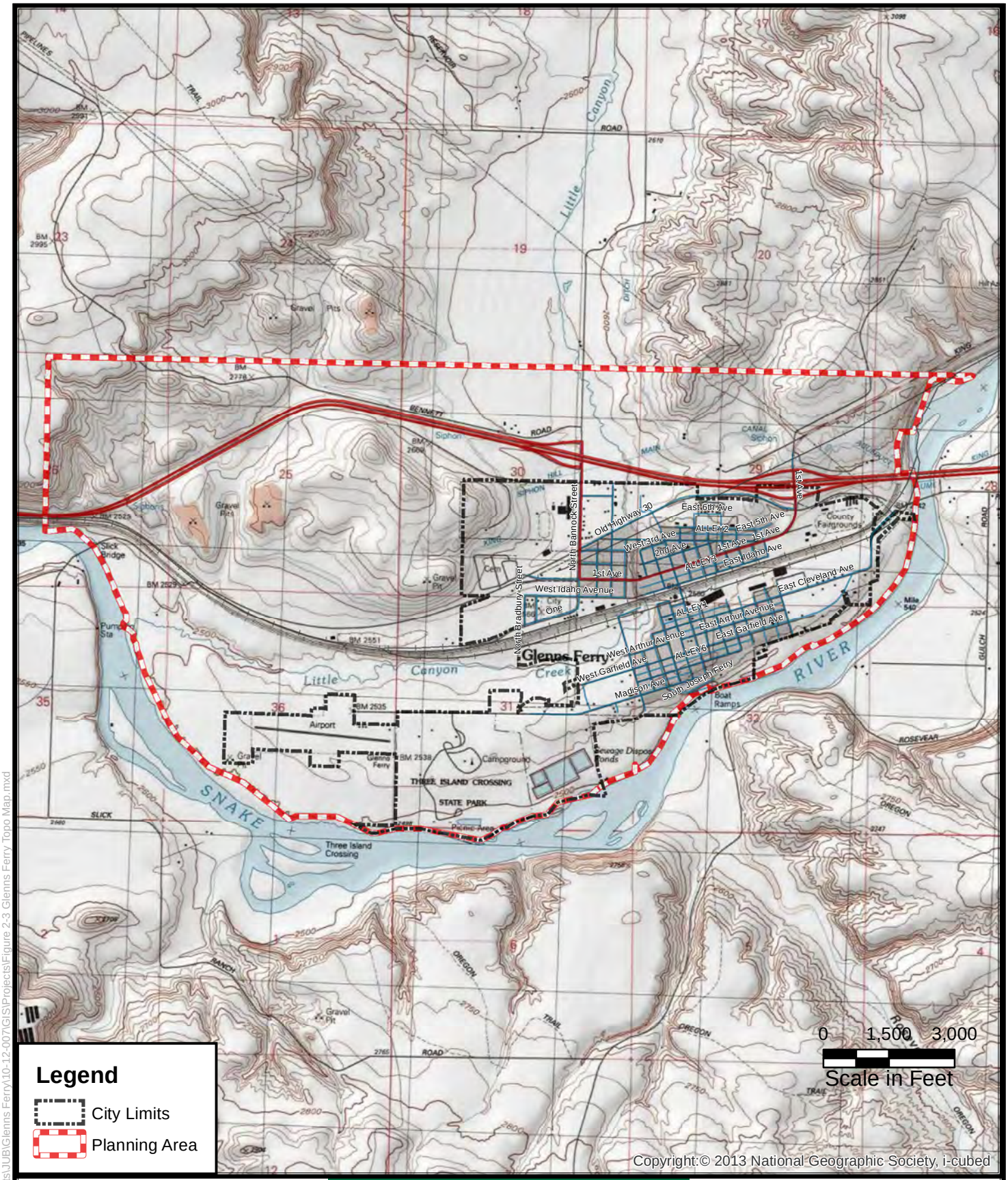
Path: F:\Projects\JUB\Glenns Ferry\10-12-007\GIS\Projects\Figure 2-2 Glenns Ferry City limits and water service planning area.mxd

8/25/2014



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WATER SYSTEM FACILITIES PLAN

FIGURE 2-3

USGS TOPOGRAPHIC MAP

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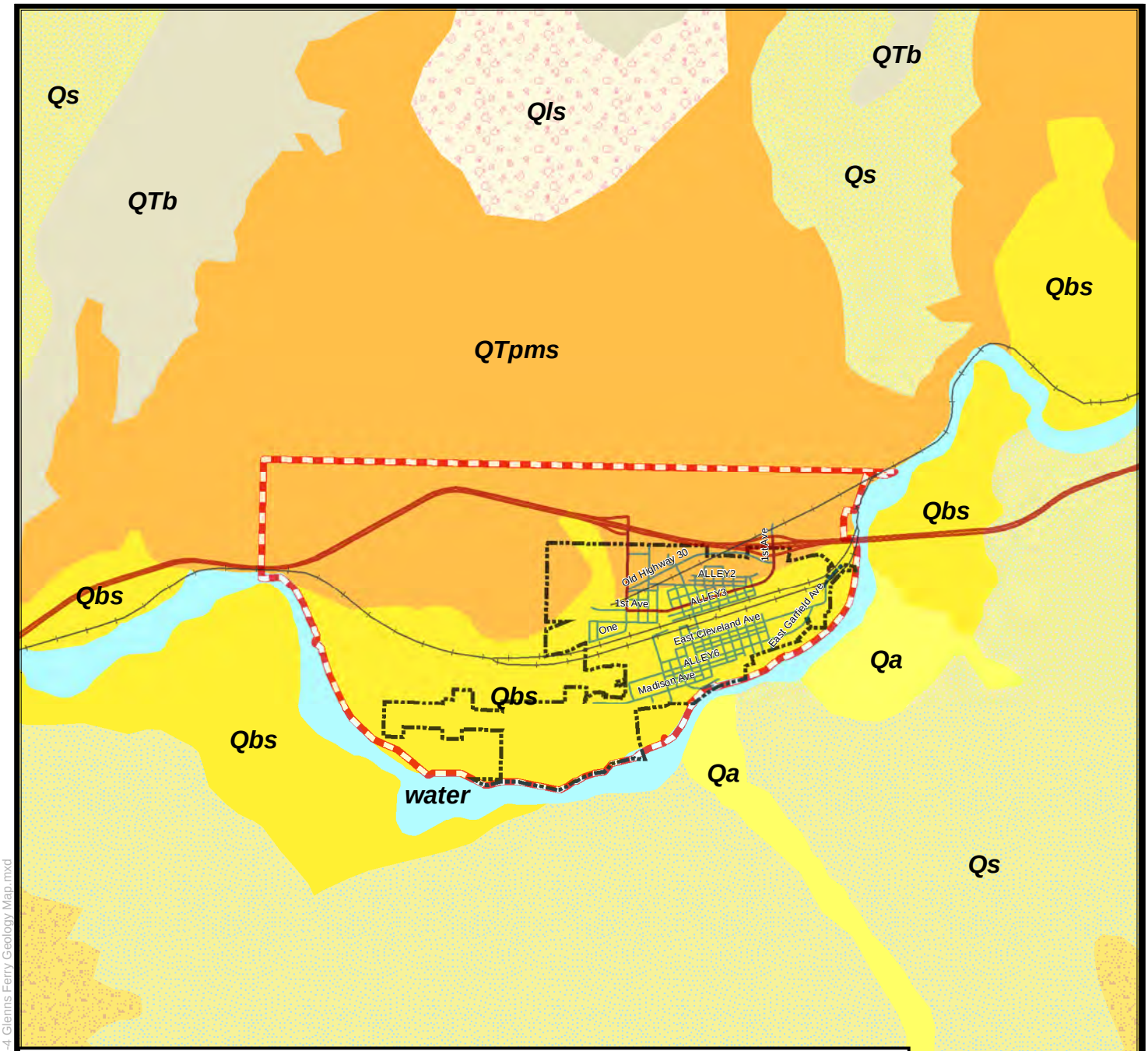
8/25/2014 Path: F:\Projects\JUB\Glenns Ferry\10-12-007\GIS\Projects\Figure 2-3 Glenns Ferry Topo Map.mxd



Geology Legend

- QTb - Basalt (Pleistocene and Pliocene)
- QTpms - Sedimentary rocks associated with Basin and Range extension (Quaternary, Pliocene, and Miocene)
- QTs - Sediments and sedimentary rocks (Pleistocene and Pliocene)
- Qa - Alluvial deposits (Quaternary)
- Qbs - Lake Bonneville deposits (Pleistocene)
- Qls - Landslide deposits (Quaternary)
- Qs - Fluvial and lake sediment (Quaternary)
- Water

Legend

- City Limits
- Planning Area

WATER SYSTEM FACILITIES PLAN

FIGURE 2-4

CITY OF GLENNS FERRY AREA GEOLOGY

J-U-B ENGINEERS, INC.

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Path: F:\Projects\JUB\Glenns Ferry\10-12-007\GIS\Projects\Figure 2-4 Glenns Ferry Geology Map.mxd

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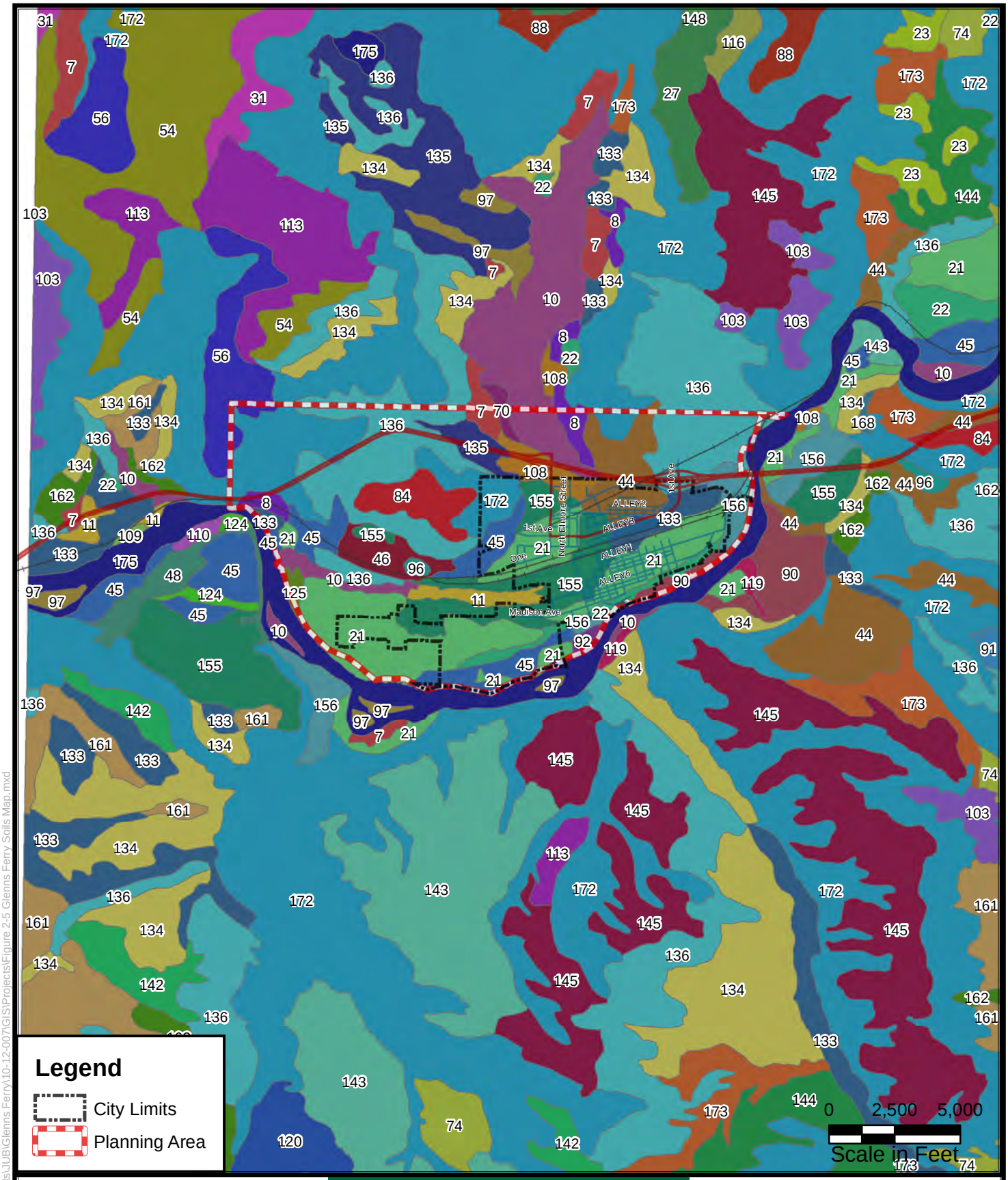


WATER SYSTEM FACILITIES PLAN

FIGURE 2-5

NRCS SOIL SURVEY MAP

J-U-B ENGINEERS, INC.

Path: F:\Projects\JUB\Glenns Ferry\10-12-007\GIS\Projects\Figure 2-5 Glenns Ferry Soils Map.mxd

8/25/2014

Table 2-1 summarizes various characteristics of the predominant soil types in the Planning Area.

TABLE 2-1. SOIL CHARACTERISTICS

Label	Soil Type	Slope	Drainage	Use
7	Bahem Silt Loam	0-4%	Well Drained	Irrigated Cropland
8	Bahem Silt Loam	4-8%	Well Drained	Irrigated Cropland
10	Baldock Loam	0-2%	Poorly Drained	Rangeland
11	Bram Silt Loam	0-2%	Somewhat Poorly Drained	Rangeland
21	Buko Fine Sandy Loam	1-4%	Well Drained	Irrigated Cropland
22	Buko Fine Sandy Loam	4-12%	Well Drained	Rangeland
44	Davey Loamy Sand	4-12%	Somewhat Excessively Drained	Irrigated Cropland
45	Davey Loamy Fine Sand	0-4%	Somewhat Excessively Drained	Irrigated Cropland
46	Davey-Buko Complex	1-12%	Somewhat Excessively Drained	Irrigated Cropland
48	Davey-Quincy Complex	1-12%	Somewhat Excessively Drained	Rangeland
56	Elijah-Purdam Silt Loams	0-8%	Well Drained	Irrigated Cropland
70	Grandview Loam	0-4%	Moderately Well Drained	Irrigated Cropland
84	Jacquith Loamy Sand	4-12%	Well Drained	Irrigated Cropland
90	Lankbush Sandy Loam	0-4%	Well Drained	Irrigated Cropland
92	Lankbush-Jenness Association	0-4%	Well Drained	Irrigated Cropland
96	Letha Loam	0-2%	Somewhat Poorly Drained	Rangeland
97	Letha-Baldock Loams	0-2%	Somewhat Poorly Drained	Rangeland
108	Monroe-Jenness Complex	0-2%	Well Drained	Irrigated Cropland
119	Power-Purdam Silt Loams	0-1%	Well Drained	Irrigated Cropland
124	Quincy Fine Sand	0-12%	Excessively Drained	Rangeland
125	Quincy Loamy Fine Sand	12-30%	Excessively Drained	Rangeland
133	Royal Fine Sandy Loam	0-4%	Well Drained	Irrigated Cropland
134	Royal Fine Sandy Loam	4-12%	Well Drained	Irrigated Cropland
135	Royal-Davey Complex	0-12%	Well Drained	Irrigated Cropland
136	Royal-Davey Complex	12-40%	Well Drained	Rangeland
155	Timmerman Sandy Loam	0-4%	Somewhat Excessively Drained	Irrigated Cropland
156	Timmerman Sandy Loam	4-12%	Somewhat Excessively Drained	Irrigated Cropland
172	Xeric Torriorthents and Xerollic Camborthids	8-20%	Well Drained	Rangeland

Sands and gravels prevail within the City boundaries along with some hard clays and silts. The gravelly soils provide good bearing capacity and drainage and are an ideal construction material. Conversely, black flowing sand is common in much of the city's southern area. Flowing black sand has a very poor angle of repose generally requiring two feet of width for each foot of depth. Trench shoring and other safeguards are necessary during construction in this area.

2.2.2 Surface and Ground Water Hydrology

Glenns Ferry rests along the Snake River above the Western Snake River Plain Aquifer. The Western Plain Aquifer is generally considered to begin slightly east of Glenns Ferry at King Hill. Groundwater in Glenns Ferry is limited, while surface water is plentiful. Outlying farms have wells which reportedly do not produce large quantities of water. Little Canyon Creek flows through town and effectively provides drainage of surface water runoff. Little Canyon Creek discharges to the Snake River. The Snake River flows south of the City.

The City's drinking water supply comes from a spring and the Snake River. The sources are combined in an infiltration gallery and subsequently pumped to the Water Treatment Plant (WTP). An in depth discussion of the water supply with an explanation of the decision to utilize

the Snake River for drinking water is contained in the 1993 and 1997 Preliminary Engineering Reports submitted to and accepted by IDEQ.

The WTP uses a membrane system to filter out contaminants. The membrane system is capable of treating 1 million gallons per day. The WTP was constructed so that a second bank of membranes could be installed that would double capacity when needed. The WTP's operation is carefully monitored and maintained in strict compliance with all applicable regulations.

2.2.3 Fauna, Flora, and Natural Communities

The City of Glenns Ferry has been continuously utilized for farming, cattle grazing, and railroad activities for more than 100 years. Most prevailing plants such as Russian Thistle, Russian Olive, Locust Trees, and cheat grass arrived with immigrating pioneers. Indigenous species such as bunch grasses and other native plants are not common within the City limits or in the Planning Area.

Animals commonly found in the vicinity of the City include squirrels, rock chuck, fox, skunks and coyote. Deer are also sighted in the area. Fish common in the Snake River include bass, carp, trout, sturgeon, and other fish species. Migratory wildlife, many of which are avian species, use the area seasonally. Common game birds in and around the Planning Area include pheasants, partridge, quail and sage grouse. Waterfowl such as geese and ducks are often found concentrated along the Snake River and other drainage ways. Raptors such as hawks, eagles, and owls are also found in the area.

Endangered, threatened, proposed, and candidate species listed by the U.S. Fish and Wildlife Service for Elmore County are shown below in Table 2-2. It should be noted that Elmore County is very large and extends all the way to the Sawtooth Mountains. Some of the species listed below may not be able to survive in the desert climate of Glenns Ferry.

2.2.4 Land Use and Development

Land use within the Planning Area is mostly residential and agricultural, with some areas of commercial and industrial development. Land use and development is regulated by the city through subdivision ordinances and the comprehensive plan. Figure 2-6 shows a current zoning map of the City and the Area of Impact depicting the generalized land use designations.

Residential housing in the city consists primarily of single family homes. There are also trailer parks, a multifamily housing complex, a government subsidized apartment complex, and two motels.

Industrial development has decreased in recent years. The Idahoan potato dehydration and flake processing plant operated in Glenns Ferry for many years until its closure in 2008 resulted in the loss of 130 jobs. Glenns Ferry used to be a hub for the Union Pacific Railroad until the early 1970's when the railroad closed operations in the city.

TABLE 2-2. ENDANGERED, THREATENED, PROPOSED, AND CANDIDATE SPECIES

Group	Name	Status
Birds	Greater Sage-Grouse *(Centrocercus urophasianus)*	Candidate
Birds	Yellow-Billed Cuckoo *(Coccyzus americanus)*	Proposed
Mammals	Canada Lynx (*Lynx Canadensis*)	Threatened
Mammals	North American Wolverine (*Gulo gulo luscus*)	Proposed
Fish	Bull Trout (*Salvelinus confluentus*)	Threatened – Designated Critical Habitat
Mullosks	Bliss Rapids Snail *(Taylorconcha serpenticola)*	Threatened
Mullosks	Snake River Physa Snail *(Haitia (Physa) natricina)*	Endangered
Plants	Slickspot Peppergrass (*Lepidium papilliferum*)	Proposed Critical Habitat
Plants	Whitebark Pine (*Pinus albicaulis*)	Candidate

Existing commercial development includes Carmela Vineyards, some restaurants, and a golf course. Additionally, the Academy of Equine Dentistry resides in Glenns Ferry. The Academy provides educational opportunities leading to certification in equine dentistry.

The areas surrounding Glenns Ferry are predominantly used for agricultural purposes.

2.2.5 Cultural Resources

Glenns Ferry has a rich history as one of the most famous river crossings on the Oregon Trail. Three Island State Park is home to the Oregon Trail History and Education Center, where visitors can learn about pioneer immigrants and Native American history.

The Oregon Trail crossed the Snake River at Glenns Ferry because this portion of the river is relatively shallow. Eventually a ferry system was implemented that allowed travelers to cross all year. This mostly permanent arrangement allowed opportunities for other businesses and provided the base for the City's economic development as it appears today.

By the 1880's, Glenns Ferry had become a railroad hub for the Union Pacific Railroad. This endeavor functioned until the early 1970's when the railroad closed its Glenns Ferry operations.

The Three Island State Park Visitor Center houses a cultural center that displays Native American and Oregon Trail artifacts. Glenns Ferry also supports a historical museum and hosts the annual Elmore County Fair and Rodeo. Glenns Ferry is the home of several buildings which are listed in the National Register of Historic Places in Idaho, namely:

- Amustutz Apartments
- Glenns Ferry School, which houses the Glenns Ferry Museum
- Our Lady of Limerick Catholic Church
- O'Neill Brothers Building
- McGinnis, J.S., Building

- Gorby Opera Theater

2.2.6 Public Utilities and Services

The City is serviced by a full complement of public utilities and services. These services are intended for the permanent and seasonal residents of Glenns Ferry as well as the immediate surrounding county residents. Some of the public utilities and services offered within the area include:

TABLE 2-3. PUBLIC UTILITIES AND SERVICES

Provider	Service
City of Glenns Ferry	Water, sewer, irrigation, police protection, fire protection
Idaho Power	Electricity
King Hill Irrigation	Irrigation
RTI Rural Telecom, RTC Wireless, Comcast, Wildblue, Centurylink	Phone, Internet, Television Service
Glenns Ferry Health Center	Ambulance / Life Flight
Intermountain Gas	Natural Gas

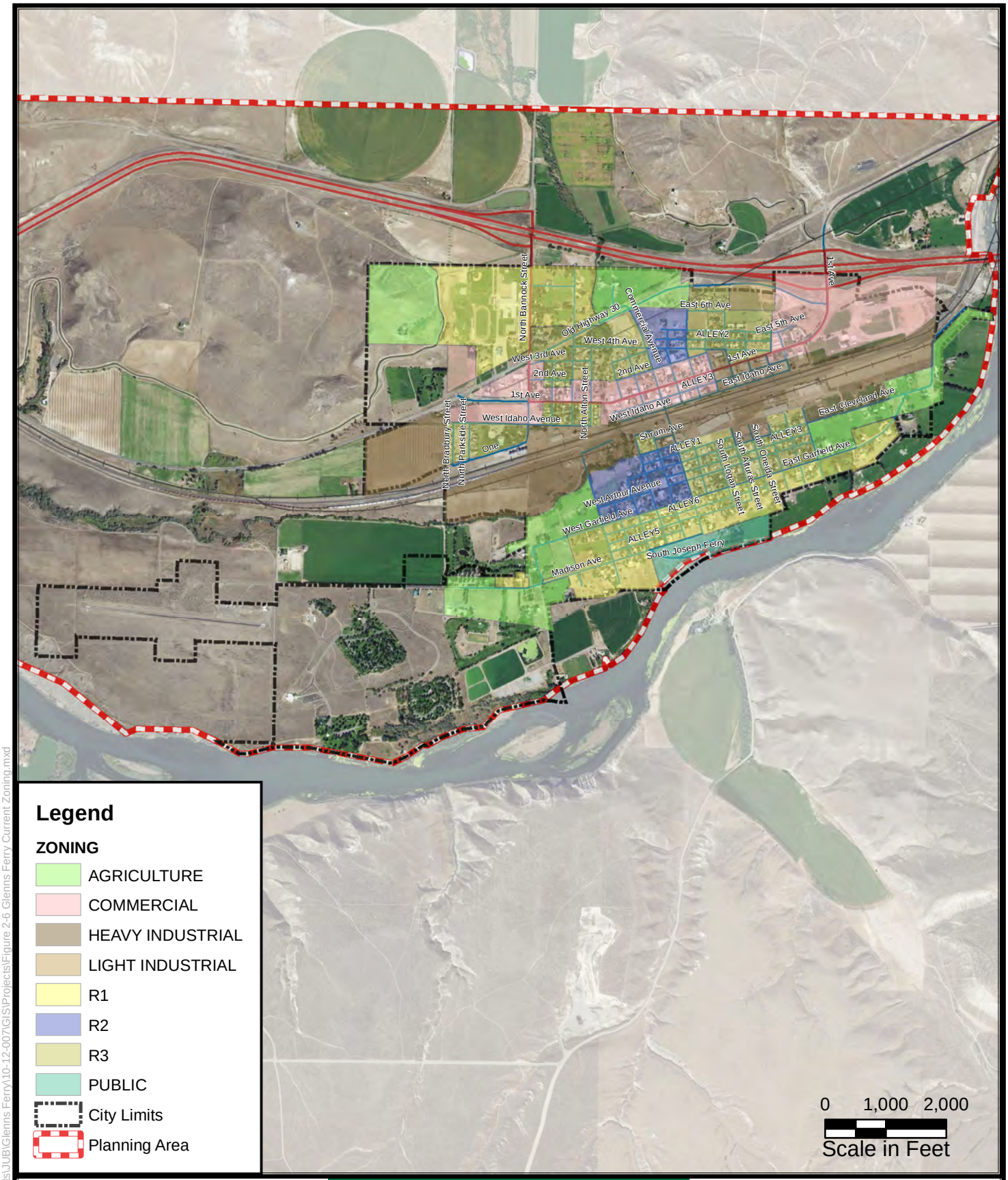
2.2.7 Floodplains and Wetlands

The Federal Emergency Management Agency (FEMA) web site provides ratings on flood risk within the City limits of Glenns Ferry. Flood Insurance Rate Map (FIRM) Community Panel Number 160057 0001 B addresses Glenns Ferry. The FIRM shows three flood designations:

- Zone AE - 100 year flood with base flood elevations shown on map
- Zone A - 100 year flood with no base flood elevations determined
- Zone X - outside 500-year flood plain

The FEMA map does not address the 25 and 50 year flood plains. Most of the City is designated Zone X. Zone AE parallels Little Canyon Creek, which can occasionally flash flood. The extent of flooding depends on snow melt, snow pack, and the storm event intensity and duration. The width of potential flooding varies up to 500 feet. Zone A is a small strip roughly reflecting the boat dock area. The FEMA map for Glenns Ferry is shown in Figure 2-7.

The U.S. Fish and Wildlife Service's National Wetlands Inventory provides mapping of wetlands across the United States. The basic criteria that define wetland types are water depth and permanence, water chemistry, life form of vegetation, and dominant plant species. Wetlands are categorized in a hierarchical structure, progressing from systems and subsystems at the most general levels, to classes, subclasses, and dominance types. Special modifiers describe wetlands that have been either created or highly modified by man or beavers. There are five defined systems used by the Fish and Wildlife Service: marine, estuarine, riverine, lacustrine, and palustrine.



Legend

ZONING

- AGRICULTURE
- COMMERCIAL
- HEAVY INDUSTRIAL
- LIGHT INDUSTRIAL
- R1
- R2
- R3
- PUBLIC
- City Limits
- Planning Area

WATER SYSTEM FACILITIES PLAN

FIGURE 2-6

CITY OF GLENNS FERRY CURRENT ZONING

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Path: F:\Projects\JUB\Glenns Ferry\10-12-007\GIS\Projects\Figure 2-6 Glenns Ferry Current Zoning.mxd

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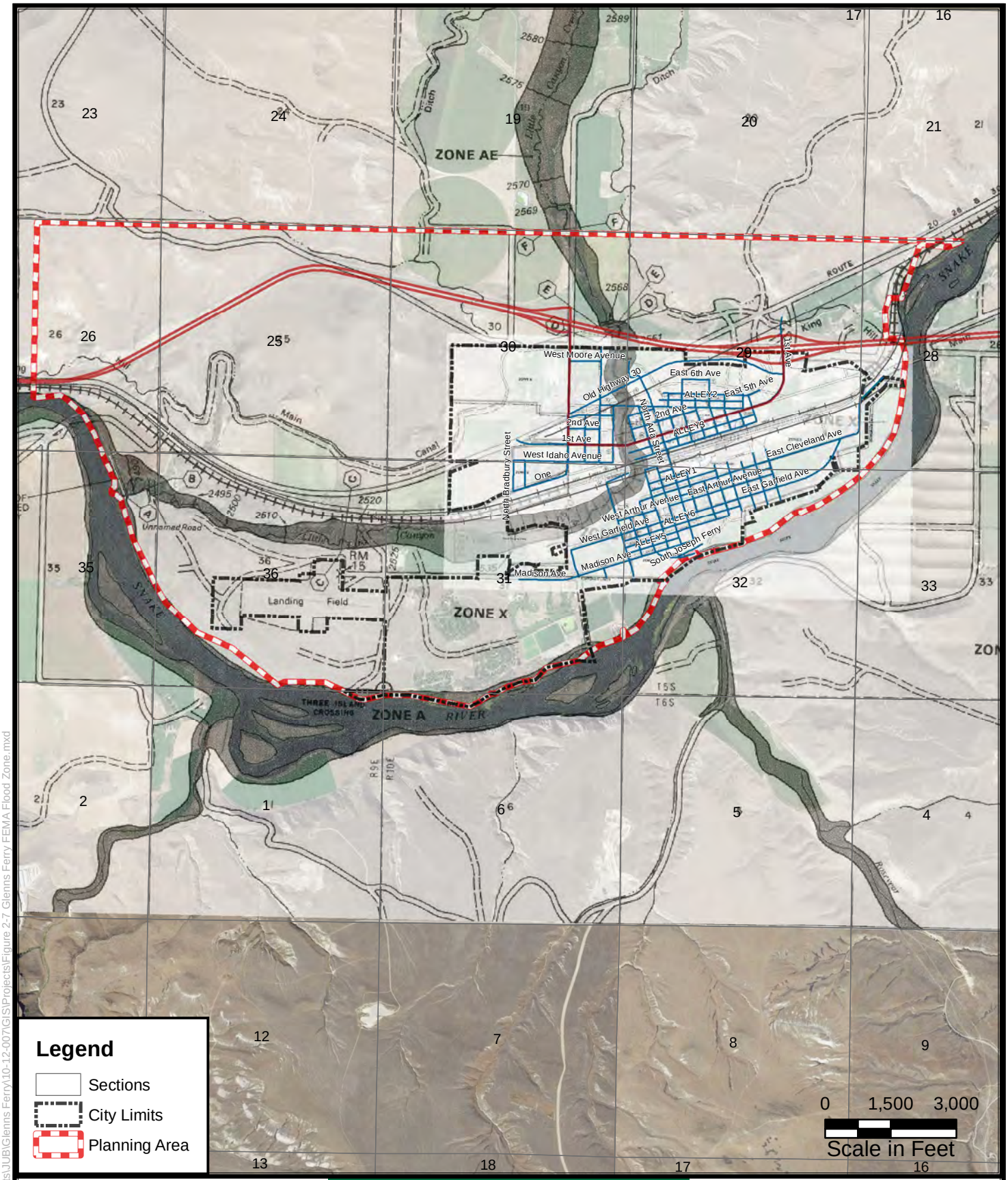


WATER SYSTEM FACILITIES PLAN

FIGURE 2-7

FEMA FLOOD ZONE MAP

J-U-B ENGINEERS, INC.

8/25/2014 Path: F:\Projects\JUB\Glenns Ferry\10-12-007\GIS\Projects\Figure 2-7 Glenns Ferry FEMA Flood Zone.mxd

According to the U.S. Fish and Wildlife Services (USFWS) National Wetlands Inventory Map, there are some wetlands located within the Planning Area. These are described below in Table 2-4.

TABLE 2-4. WETLAND AREAS LOCATED WITHIN THE PLANNING AREA

Label	Location	Description
PUBKx	Wastewater lagoons	Palustrine system with an unconsolidated bottom, artificially flooded, and excavated through artificial means
PEMC	Isolated areas near lagoons	Palustrine system with emergent vegetation, seasonally flooded
PFOC	Three Island State Park	Palustrine system with forested vegetation, seasonally flooded
PABH	Three Island State Park	Palustrine system with aquatic bed, permanently flooded

Figure 2-8 shows the wetland areas that have been delineated by USFWS.

2.2.8 Wild and Scenic Rivers

The Wild and Scenic Rivers Act, as promulgated by Congress on October 2, 1968, states that "…certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreation, geologic, fish and wildlife, historic, cultural, or other similar values, shall be protected for the benefit and enjoyment of present and future generations."

The Snake River and Little Canyon Creek flow past and through Glenns Ferry, respectively. Neither water body has been designated as wild and scenic (the Snake River has been designated as wild and scenic in a different area of the state where it passes through Hells Canyon). At present, there are no plans for classification of any surface water systems within the Glenns Ferry Planning Area.

2.2.9 Public Health and Water Quality Considerations

2.2.9.1 Public Health Considerations

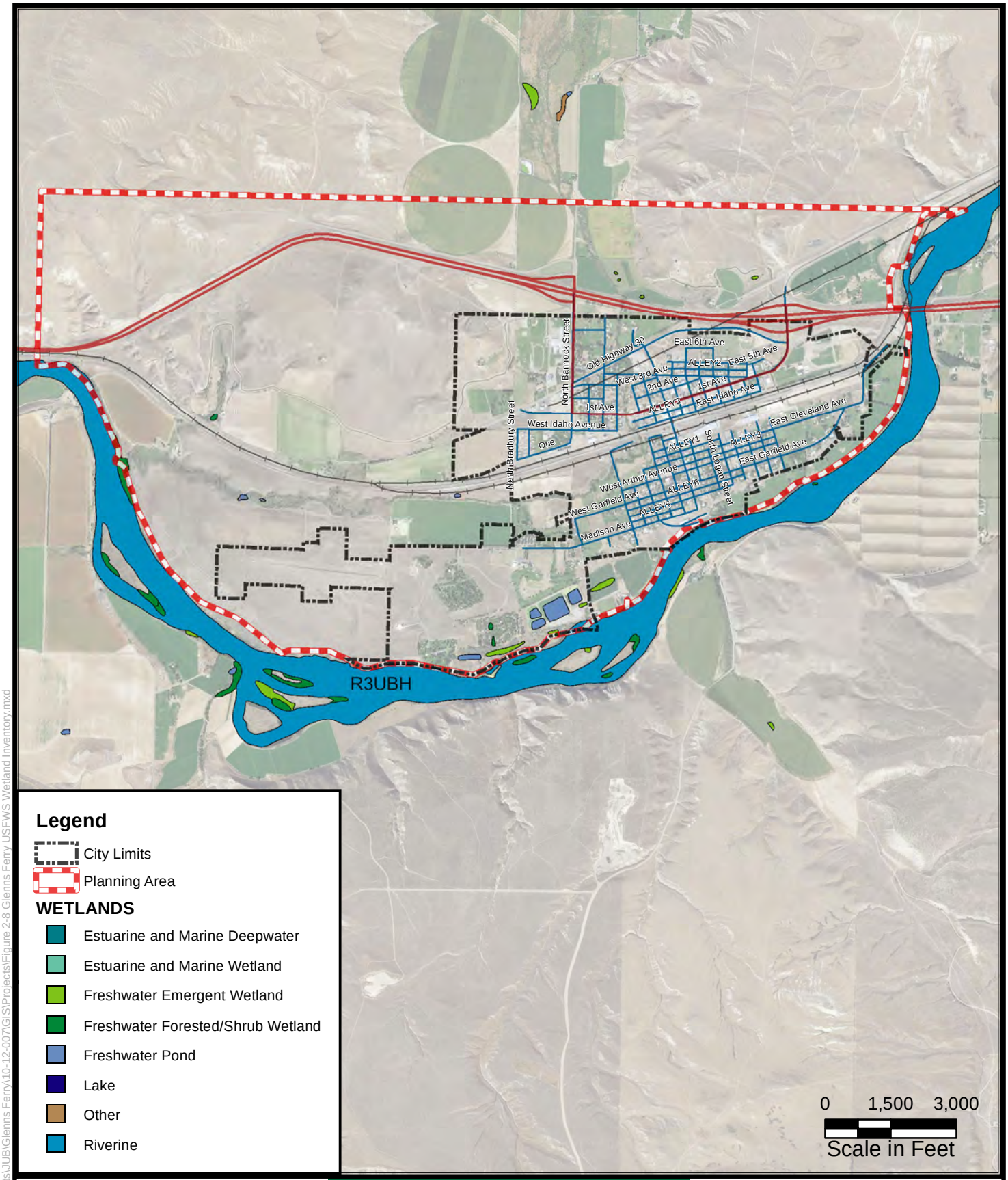
The Glenns Ferry Planning Area has minimal public health problems.

If a construction project results from this master plan, a storm water pollution prevention plan (SWPPP) will be prepared prior to the construction. The SWPPP will be tailored specifically to the proposed project and serve to minimize soil erosion, contain sediment, and protect surface water quality during the construction activities.

2.2.9.2 Water Systems in Proposed Project Area

2.2.9.2.1 Drinking Water

The City's water supply comes from a spring and the Snake River. An in depth discussion of the water supply with an explanation of the decision process to utilize the Snake River for drinking water supplies is contained in the 1993 and 1997 Preliminary Engineering reports submitted to



Legend

- City Limits
- Planning Area

WETLANDS

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

CITY OF GLENNS FERRY

WATER SYSTEM FACILITIES PLAN

FIGURE 2-8

U.S. FWS WETLANDS INVENTORY MAP

J-U-B ENGINEERS, INC.

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Path: F:\Projects\JUB\Glenns Ferry\10-12-007\GIS\Projects\Figure 2-8 Glenns Ferry USFWS Wetland Inventory.mxd

8/25/2014

and accepted by IDEQ. The sources are combined in an infiltration gallery and subsequently pumped to the membrane water treatment plant.

The drinking water system is described in detail in this report. Figure 3-1, in the following chapter, shows the drinking water system in the community.

2.2.9.2.2 Wastewater

The City's wastewater collection system currently serves the majority of properties within the city limits. Two different trunk lines convey sewage to the wastewater treatment lagoons. There is one lift station that serves lower lying areas in the City. There are still some areas within the City limits that use septic systems; sewage from these properties is not treated at the lagoons.

The treatment lagoons consist of one aerated pond, three facultative/polishing ponds, and five rapid infiltration basins. Effluent from the lagoons is discharged into the Snake River.

The wastewater system is described in detail in the 2014 Wastewater Facilities Master Plan. A map showing the wastewater system in the community is included in Figure 2-9.

2.2.9.2.3 Irrigation

Portions of the City are served by a secondary irrigation system maintained by King Hill Irrigation District. A map showing the secondary irrigation system in the community is included in Figure 2-10.

2.2.10 Important Farmland Protections

Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is available for these uses, as defined by the U.S. Environmental Protection Agency (EPA) Policy to Protect Environmentally Significant Agricultural Lands of 1978. Much of the land area located adjacent to the City is used for agriculture.

The following soil types in the vicinity of the Planning Area have been designated as "prime" farmland if irrigated (see Figure 2-5): Bahem Silt Loam, Buko Fine Sandy Loam, Davey Loamy Sand, Elijah-Purdam Silt Loams, Grandview Loam (if reclaimed of excess salts and sodium), Jacquith Loamy Sand, Lankbush Sandy Loam, Lankbush-Jenness Association, Monroe-Jenness Complex, Power-Purdam Silt Loams, and Timmerman Sandy Loam

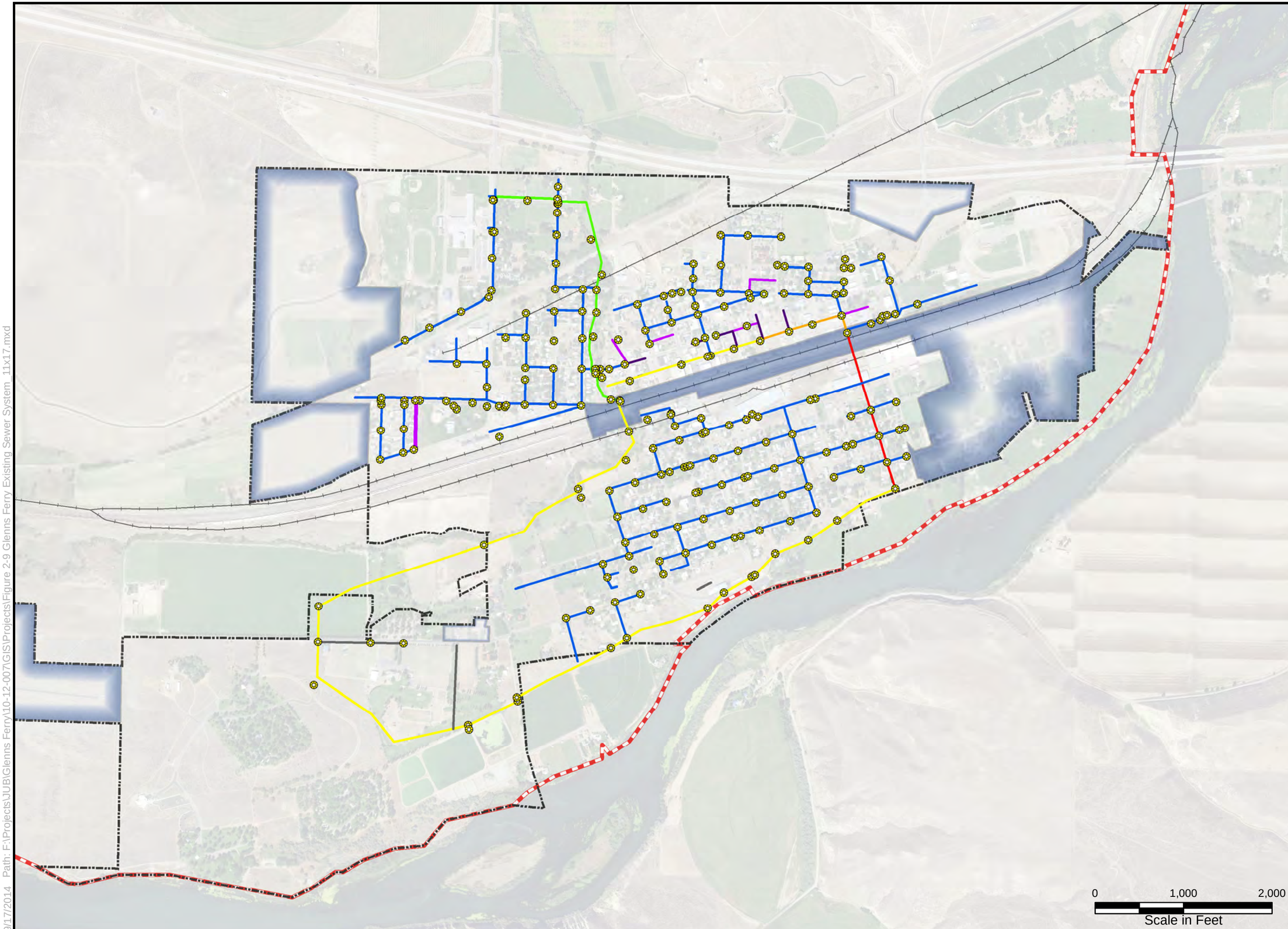

FIGURE 2-9

CITY OF GLENNS FERRY SEWER SYSTEM

WATER SYSTEM FACILITIES PLAN

Legend

- Sewer Manholes

Sewer Line by Pipe Size

- 4
- 6
- 8
- 10
- 12
- 18
- 24
- Unknown Size
- Areas on Septic Systems
- City Limits
- Planning Area

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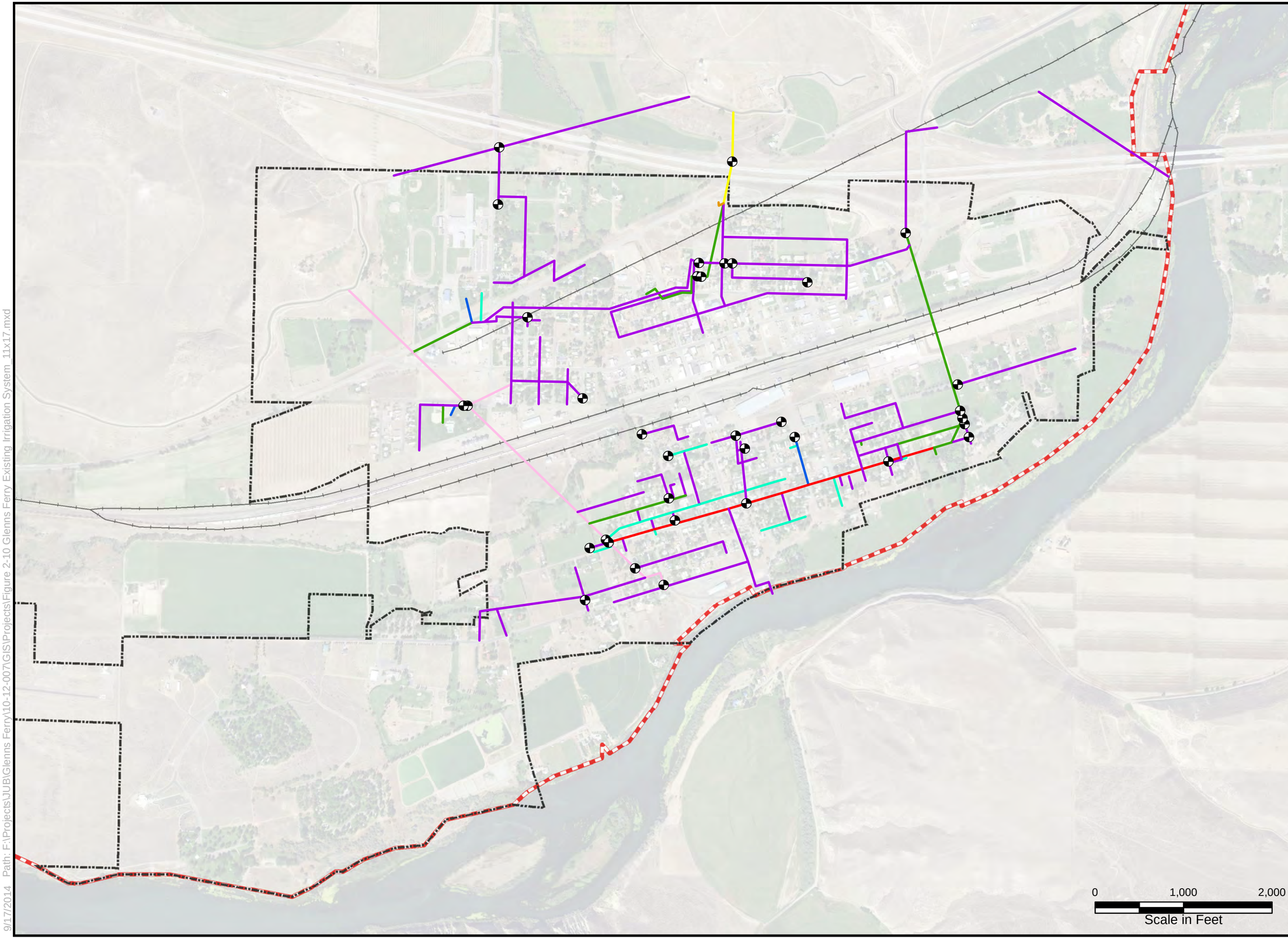
9/17/2014 Path: F:\Projects\JUB\Glenns Ferry\10-12-007\GIS\Projects\Figure 2-9 Glenns Ferry Existing Sewer System_11x17.mxd

FIGURE 2-10

CITY OF GLENNS FERRY IRRIGATION SYSTEM

WATER SYSTEM FACILITIES PLAN



Legend

- Irrigation Valves

Irrigation Pipe by Diameter

- 2"
- 4"
- 5"
- 6"
- 8"
- 10"
- 18"
- Unknown Size
- City Limits
- Planning Area

J-U-B ENGINEERS, INC.

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9/17/2014 Path: F:\Projects\JUB\Glenns Ferry\10-12-007\GIS\Projects\Figure 2-10 Glenns Ferry Existing Irrigation System_11x17.mxd

2.2.11 Proximity to Sole Source Aquifer

The Sole Source Aquifer (SSA) program was established under Section 1424(e) of the Safe Drinking Water Act (SDWA) of 1974. The program allows individuals and organizations to petition the EPA to designate aquifers as the "sole or principal" source of drinking water for an area. To meet the criteria for designation, a sole source aquifer must supply at least 50 percent of the drinking water consumed in the area overlying the aquifer. The EPA guidelines also stipulate that these areas can have no alternative drinking water source(s) which could physically, legally, and economically supply all those who depend upon the aquifer for drinking water.

The Environmental Protection Agency has published a map titled “Designated Sole Source Aquifers in EPA Region X Idaho, Oregon, Washington”. The Eastern Snake River Plain Aquifer is designated as a Sole Source Aquifer. However, this aquifer terminates slightly east of Glenns Ferry in the vicinity of King Hill. Glenns Ferry is located above the Western Snake River Plain Aquifer which is not designated as a sole source aquifer.

2.2.12 Air Quality and Noise

Glenns Ferry generally has excellent air quality. Due to the gorge effect, air is constantly exchanged and renewed. Glenns Ferry is well removed from urbanized areas and the City is not located in an air quality “non-attainment area”. There are no significant sources of air pollution in the immediate vicinity. Higher levels of particulate matter may be experienced during significant wind events or during certain times of the agricultural season due to farming practices.

Noise from sources other than background sources are minimal with the notable exception of the Union Pacific Railroad, which requires locomotives to provide warning whistles when crossing roads. The locomotives themselves are also a noise source. In both cases the noise level is elevated for a short duration of time.

2.2.13 Precipitation, Temperature, and Prevailing Winds

Glenns Ferry is located in a desert climate as defined by averaging less than 10 inches of precipitation per year. The temperatures are considered to be relatively mild, typically ranging between 60 and 100 degrees during the summer, and 10 to 50 degrees during the winter. Sunshine prevails with 290 days of clear blue sky each year.
Table 2-3 summarizes historical temperature, precipitation, snowfall, and evaporation data for the Planning Area. Winter weather is characterized by alternating high and low pressure systems that bring associated inclement or clear conditions. January is historically the coldest month with an average temperature of approximately 29.7°F. Most of the annual precipitation falls as snow during the winter months. Summer weather is normally dry with warm to hot temperatures. July is historically the warmest month with an average temperature of approximately 76.7°F. The warm summer temperatures combined with low relative humidity produce an annual evaporation rate of approximately 45 inches.

Prevailing winds travel from west to east in the Snake River Gorge area. The average wind speed is approximately 8 mph with occasional higher wind gusts.

TABLE 2-5. MONTHLY CLIMATIC DATA

Month	Mean Temperature[1] (°F)	Mean Precipitation[1] (in)	Mean Snowfall[1] (in)	Mean Evaporation[2] (in)
January	29.7	1.28	5.2	0.23
February	36.0	0.95	2.7	0.68
March	43.5	0.83	0.7	1.80
April	51.2	0.72	0.2	3.60
May	59.7	0.84	0.0	6.30
June	68.1	0.66	0.0	6.75
July	76.7	0.23	0.0	7.65
August	73.6	0.20	0.0	7.20
September	63.1	0.35	0.0	4.50
October	51.4	0.62	0.0	2.70
November	39.8	1.22	1.0	2.25
December	31.3	1.19	3.6	1.34
Annual	**52.0**	**9.08**	**13.4**	**45.0**

1. Monthly averages for Glenns Ferry from the Western Regional Climatic Center (1905-2012). (www.wrcc.dri.edu/summary/Climsmsid.html).
2. From "Monthly Shallow Pond Evaporation in Idaho", Molnau, Kpordze and Craine, 1992, ASAE Paper PNW 92-111 (Region 3).

2.2.14 Energy Production and Consumption

A majority of the population in the Planning Area consumes energy in the form of electricity, natural gas, propane, and/or fuel oil. However, the City of Glenns Ferry does not actively participate in energy production. Nearly all of the State of Idaho's power demand is supplied by hydroelectric power, which is a renewable energy source.

The city is conscious of energy consumption and proactively retrofitted City Hall with a rigid insulation roof package covered with a white elastomeric membrane system. Additionally, the building has been updated with insulated windows and the exterior has been insulated and covered with stucco.

The City constantly looks for energy saving opportunities when replacing equipment and updating buildings.

2.2.15 Economic and Social Profile

Glenns Ferry has one school that serves all grades, city residents, and adjacent areas. The school is relatively new and up to date.

There is a health clinic for day to day wellness needs. Life Flight is available at the clinic's heliport. Fixed wing flights can utilize the 3,000 foot airport runway.

According to the 2008-2012 American Community Survey 5-Year Estimates for the U.S. Census Bureau, the median household income is $30,429 and the per capita income is $18,168. 14.6 percent of families in Glenns Ferry live at or below the U.S. Health and Human Services poverty level. The unemployment rate is 8.9%.

Data from the U.S. Census Bureau was summarized to obtain social profiles for the City of Glenns Ferry. A summary of information from the 2010 Census is shown below in Table 2-4.

TABLE 2-6. SOCIAL PROFILE

Parameter		Value
Sex		
	Total Population	1,319
	Male	49.1%
	Female	50.9%
Age		
	Under 18 Years	25.6%
	18 to 24 Years	6.4%
	25 to 44 Years	20.3%
	45 to 64 Years	24.8%
	65 Years and Over	23.0%
Race and Ethnicity		
	White	82.2%
	African American	0.2%
	Native American	2.0%
	Asian	0.4%
	Pacific Islander	0.0%
	Multi-Race	3.4%
	Other	11.8%
	Hispanic or Latino	24.6%
Education for Population 25+		
	High School or Higher	79.6%
	Bachelor's Degree or Higher	11.2%
	Graduate Degree	2.3%
Housing		
	Total Housing Units	684
	Average Household Size	2.36
	Vacant Housing Units	18.3%
	Owner-Occupied Housing Units	66.4%
	Renter-Occupied Housing Units	33.6%

1. Data from 2010 Census – U.S Census Bureau

This water system facilities plan provides a roadmap to improve the quality and capacity of drinking water services in the City. The intent is to recommend a cost effective solution uniquely suited for a developing rural community while incorporating the environmental safeguards necessary for public welfare.

It appears that no disadvantaged group will be adversely affected by a project to improve the existing water facilities. However, the community in general will collectively benefit from improving the water facilities.

Chapter 3

Existing Water System

3.0 EXISTING WATER SYSTEM

The City of Glenns Ferry's current water system consists of one surface water source, one spring source, one storage tank, a microfiltration treatment plant, a distribution network, and a control system. A map of the drinking water system is shown in Figure 3-1. According to City personnel, there are approximately 660 water connections, of which about 30 are not in use; commercial connections are estimated at about 45.

3.1 WATER SOURCE, LOCATION AND PUMPING FACILITIES

The City of Glenns Ferry draws water from the Snake River via a screened river intake, as well as a spring fed infiltration gallery located nearby. The water from both sources is blended at the infiltration gallery intake structure before being pumped to the City's water treatment plant (WTP), then on to distribution.

3.1.1. Spring Fed Infiltration Gallery

The spring box intake gallery consists of a 12 foot x 12 foot x 200 foot mortarless brick chamber and a 600 foot long pipe laid in gravel. Every other pipe length is perforated to facilitate water collection and conveyance. Four access hatches, approximately 4 feet square, provide admittance to the facility. The spring system is screened via two wye-strainers on the discharge of the spring box pump station. The spring pump station consists of two parallel vertical turbine pumps, each rated at 750 gpm at 63 feet of total dynamic head utilizing 15 horsepower (hp) motors. The static water level of the spring is above the river surface, but previous studies show that the spring water is influenced by surface water. Water is pumped from the raw water pump station sump to the WTP building.

The infiltration gallery supplied the original system with water until the early 2000's, when the City constructed its current microfiltration water treatment plant. The facility has the ability to blend water from both sources, or pull water from each source independently. The City still uses the infiltration gallery and blends water from the river and spring source at roughly a 50-50 blend. The long term firm capacity of the spring is not exactly known as the City has had access to river water for the past decade. The City estimates the sustained capacity of the spring at 500 to 1,000 gpm.

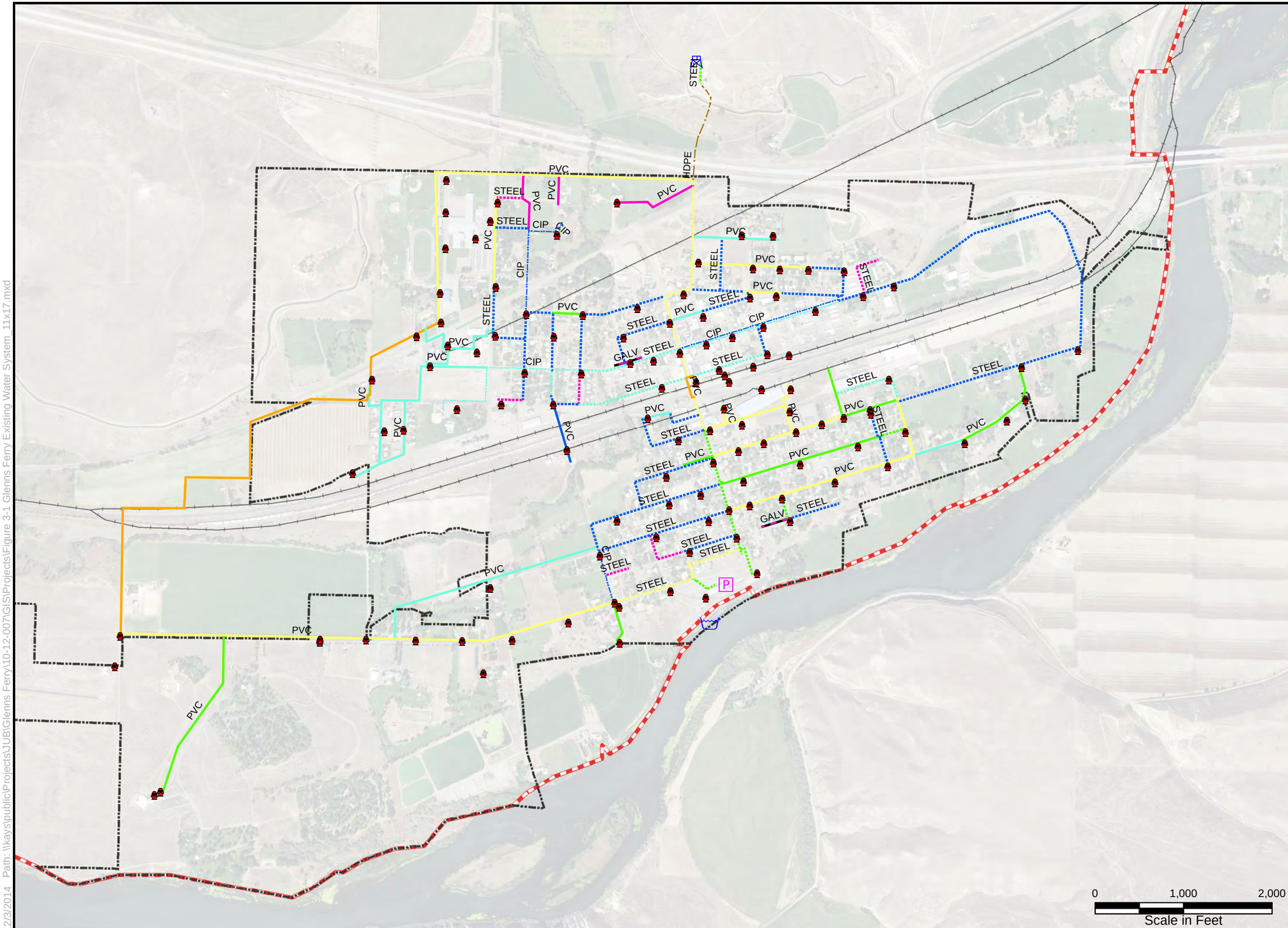
3.1.2. Surface Water

The river intake consists of a pipeline with screened opening. The river intake end contains a 1/8 inch intake coarse screen that is automatically cleaned by a 7.5 hp air scour system. The air scour system is supplied by four $1^1/_2$ inch diameter lines routed from a compressor in the raw water pump station to the river intake screen. Further screening is performed in the intake pump station in a two-step process through a large 1/16 inch mesh traveling screen, followed by an 800 micron internally fed basket style strainer. This strainer is automatically flushed using an inlet and outlet solenoid control valve with pressurized plant water. The traveling screen and basket strainer are shown in Figure 3-2 and Figure 3-3, respectively. Pumping from the river intake system consists of two parallel vertical turbine pumps, each rated at 750 gpm at 69 feet total dynamic head with 20 hp motors. The surface water intake system has been designed with a capacity of approximately 750 gpm (1.08 mgd).

FIGURE 3-1

CITY OF GLENNS FERRY EXISTING WATER SYSTEM

WATER SYSTEM FACILITIES PLAN



Legend

- Water Tank
- Snake River Intake/ Spring Infiltration Gallery
- Pump/Treatment Plant
- Fire Hydrants

Waterlines By Type and Size

CIP
- 4, CIP
- 6, CIP
- 8, CIP

GALV
- 2, GALV

HDPE
- 14, HDPE

PVC
- 2, PVC
- 4, PVC
- 6, PVC
- 8, PVC
- 10, PVC
- 12, PVC

STEEL
- 2, STEEL
- 4, STEEL
- 6, STEEL
- 8, STEEL
- 10, STEEL
- 12, STEEL
- City Limits
- Planning

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12/3/2014 Path: \\kaysPublic\Projects\JUB\Glenns Ferry\10-12-007\GIS\Projects\Figure 3-1 Glenns Ferry Existing Water System_11x17.mxd

FIGURE 3-2. RIVER INTAKE TRAVELING SCREEN STRAINER

FIGURE 3-3. RIVER INTAKE BASKET STRAINER

3.2 WATER TREATMENT FACILITIES AND OPERATIONS

The City of Glenns Ferry owns and operates a 1.08 mgd (peak capacity) microfiltration water treatment plant. The plant was constructed and began operation in 2002-2004. Water from the City's two sources pass through the treatment plant before distribution to the public.

The water filtration facility utilizes a coagulant to improve filtration effectiveness. Coagulated and flocculated raw water then passes to the microfiltration filter tanks. The hollow-fiber GE/Zenon ZeeWeed 500C microfiltration system then filters the water and pumps permeate to the plant chlorine contact chamber. As water passes to the chlorine contact chamber, sodium hypochlorite is injected for disinfection. The chlorinated water then passes through the contact chamber and back to a clear well where it is pumped to distribution. Figure 3-4 shows an overview of the WTP facility. Figure 3-5 shows a schematic of the treatment process.

FIGURE 3-4. WATER TREATMENT PLANT OVERVIEW

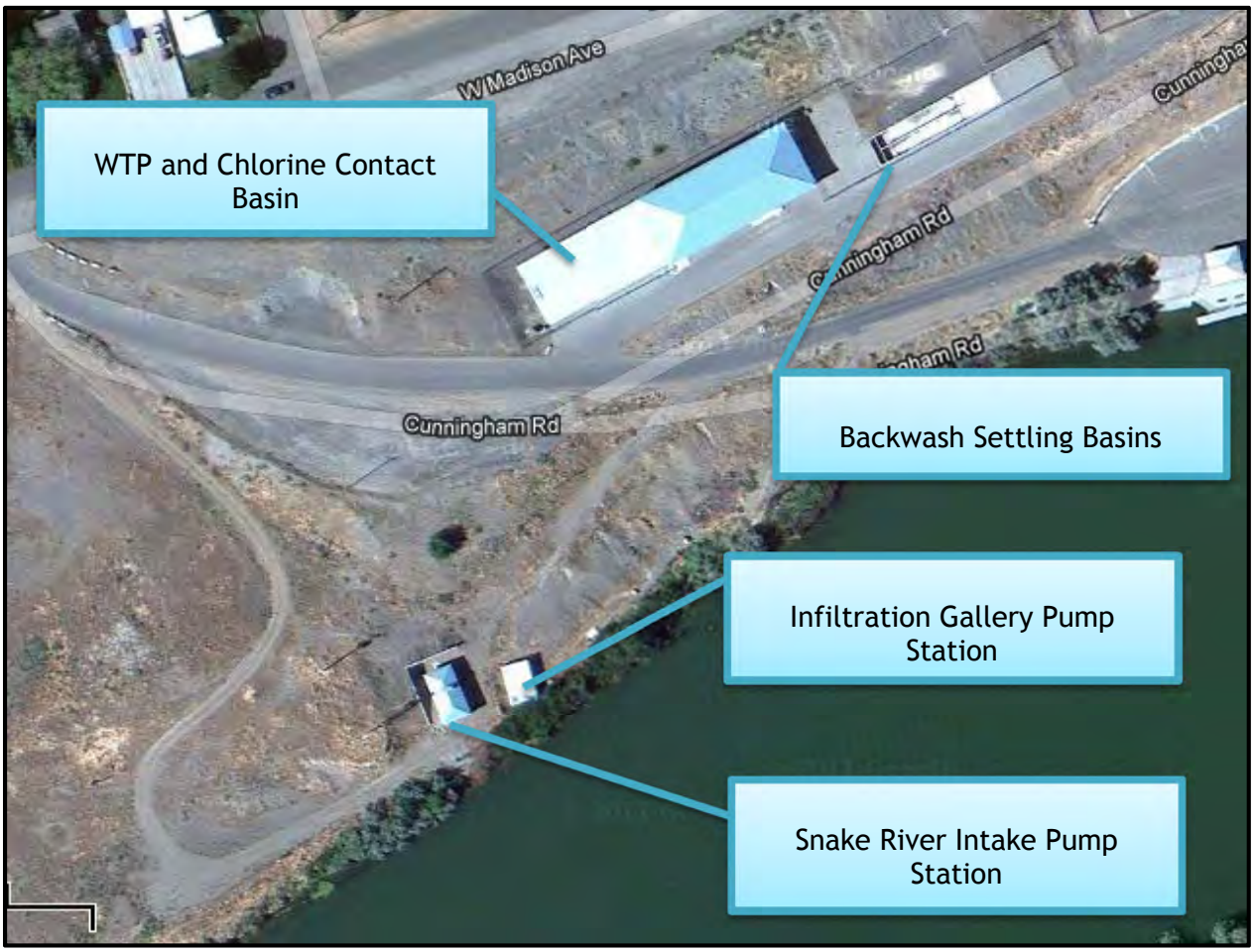
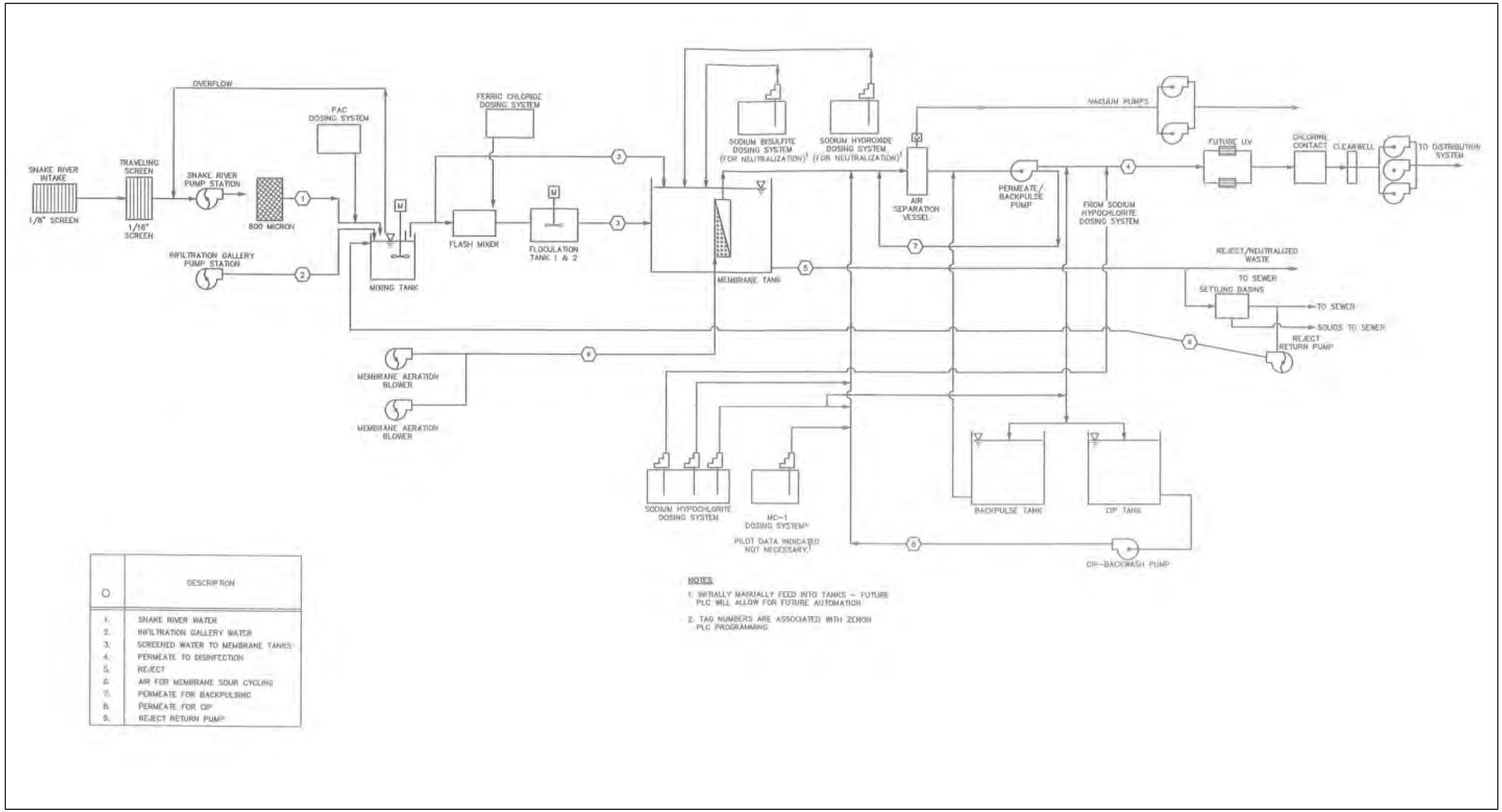


FIGURE 3-5. WATER TREATMENT PLANT PROCESS SCHEMATIC



O	DESCRIPTION
1.	SNAKE RIVER WATER
2.	INFILTRATION GALLERY WATER
3.	SCREENED WATER TO MEMBRANE TANKS
4.	PERMEATE TO DISINFECTION
5.	REJECT
6.	AIR FOR MEMBRANE SOUR CYCLING
7.	PERMEATE FOR BACKPULSING
8.	PERMEATE FOR CIP
9.	REJECT RETURN PUMP

3.2.1 Pretreatment

3.2.1.1 Chemical Feed Systems

The Glenns Ferry water treatment plant has several chemical feed systems. The primary systems dedicated to treatment include the powder activated carbon (PAC) system and the ferric chloride feed system.

3.2.1.1.1 PAC

Powder activated carbon is used to remove taste and color issues related to trace organics present in the raw water. Since the facilities construction, the PAC feed system has not been used. Subsequent filtration alone has been able to remove organics to levels low enough that taste and color in the finished water has not been a problem. Operators indicate that they have not had any complaints related to taste, color, and/or odor in the system. The PAC system is still fully operational, but has not been needed to date. The PAC feed system is shown in Figure 3-6.

FIGURE 3-6. PAC FEED SYSTEM

3.2.1.1.2 Ferric Chloride

Ferric chloride is used as a coagulant fed upstream of the filtration system. The coagulant is injected into the raw water stream and passes immediately through a flash mixer. The 3/4 hp, 3-blade flash mixer creates a 2,500 sec velocity gradient at 1,150 rpm. The blended stream then passes into one of two flocculation tanks where a controlled energy environment allows material to coagulate and develop floc that are more easily filtered from the water.

The ferric chloride feed system consists of liquid bulk barrels, and a pair of Watson-Marlow peristaltic feed pumps. The ferric feed system and injection mixer are shown in Figure 3-7 and Figure 3-8 below.

FIGURE 3-7. FERRIC CHLORIDE FEED SYSTEM

FIGURE 3-8. INJECTION MIXER

3.2.1.2 Mixing and Flocculation

Flocculation occurs in one of two raw water flocculation tanks. Each tank is approximately 11,000 gallons and is constructed out of concrete. The flocculator uses an axial mixer, 45 inches in diameter, 25 rpm with 5.0 feet/sec tip speed and 64 inches of submergence. The ferric flocculation mixer is shown in Figure 3-9.

FIGURE 3-9. FERRIC CHLORIDE FLOCCULATION MIXER

3.2.2. Filtration

Filtration at the Glenns Ferry WTP occurs via a hollow-fiber low pressure membrane system. In this configuration, the membrane filters sit inside of tanks filled with raw water. A negative pressure is applied by the permeate pumping system and raw water is pulled from the outside of the hollow-fiber membranes to the interior of the fibers. This action leaves the filtered material to build-up on the exterior of the filter fibers. As the filtered material accumulates, the required pressure to pull the water through the fibers increases. This pressure is called the transmembrane pressure (TMP) and is indicative of the fouling that is occurring on the fibers. Once the TMP climbs too high, the filters are flushed in reverse (backpulsed) to dislodge the accumulated material. At the same time it is flushed, air is scoured from the bottom of the fibers to induce agitation to help break up the material. Once the scour and backpulse is complete, the tank and backwash water is drained from the membrane tanks. Once drained, the tank is re-filled with raw-water and filtration can recommence. This process is a filtration cycle. Filters are operated in “dead-end” filtration mode. The membrane filter piping and filter bays (southern train) are shown in Figure 3-10.

FIGURE 3-10. MEMBRANE FILTER PIPING AND FILTER BAYS

3.2.2.1 Filters

The filtration system is comprised of two filter trains, each with two sub-trains. Each sub-train contains four filter ZeeWeed 500C cassettes. Design criteria from when the facility was constructed are included in Table 3-1.

During normal operation, membrane production is achieved by providing enough driving pressure to overcome flow resistance through the cake and membrane layers. The amount of pressure required (TMP) is a function of membrane permeability and the permeability of the cake layer. Generally, clean membrane permeability remains fairly stable or decreases slightly over time. The permeability of the cake layer will generally decrease as solids accumulate in the cake layer. As the layer grows, more pressure is required to force the water through the cake.

Because hydraulic resistance is a function of the viscosity of water, it will also be affected by changes in operating temperature. Permeability data is commonly normalized in order to compare it at different temperatures. Temperature normalization calculations can be complex and differ among membrane system manufacturers. For reference, the data normalization equations can be found in the GE/Zenon Operation and Maintenance manual.

3.2.2.2 Permeate and Backpulse Pumping System

Permeate pumps pull water through the filter membrane fiber by generating TMP. The same pumps are utilized for the purpose of backpulsing the membranes. To operate in backpulse mode, the valves on the suction side are closed, a valve on the permeate header is opened such that the pump pulls permeate and forces it in reverse through the membrane train that is being backpulsed. Backpulse sequences operate every fifteen minutes at a flow rate of 966 gpm for fifteen seconds. Permeate pumps and piping are shown in Figure 3-11.

TABLE 3-1. WTP DESIGN CRITERIA

Item	Size/Number/Capacity
Number of Trains	2
Cassettes per Train	4
Total Number of Cassettes	8
Normal Production Flux	27 gfd
Peak Production Flux	34 gfd
Peak Production (2 trains, all cassettes, peak flux)	952 gpm
Peak Firm Capacity (7 cassettes, peak flux)	833 gpm
Normal Production (all units at normal flux)	750 gpm
Permeate Pump Production (each pump; there are 2 duty and 1 standby pumps)	405 – 520 gpm
Design Recovery	92%
Backpulse Duration	15 sec
Backpulse Frequency	15 min
Backpulse NAOCl Concentration	1000 ppm
Air Scour Blowers	608 SCFM, 20 hp
Air Scour Cycle	10 sec on, 10 sec off
Tank Drain	Daily
Chemical CIP Cleaning Interval (NaOCl)	1 to 2 times per year
Backpulse Tank	5,200 gallons
CIP Tank	940 gallons

FIGURE 3-11. PERMEATE PUMPS AND PIPING

3.2.2.3 Vacuum Pumps and De-Aeration System

Vacuum pumps are connected to the discharge permeate suction header on each membrane train. These vacuum pumps apply a negative pressure on the suction header, removing air from the header and maintaining prime on the pumps. The de-aeration tanks also contain a water accumulator prior to the vacuum pumps. This system originally was inadequately sized and excess water was pulled into the vacuum pumps damaging them. GE/Zenon subsequently retrofitted the system with larger water accumulation tanks to mitigate the problems that had been occurring. The vacuum pumps and de-aeration tanks/vessels are shown in Figure 3-12.

FIGURE 3-12. VACUUM PUMPS AND DE-AERATION TANKS

3.2.2.4 Chemical Clean-in-Place (CIP) and Backwash Sequences

Chemical clean-in-place sequences are not typically performed at the facility. Instead, chemically enhanced backwash sequences are used to regularly clean organic fouling from the membranes. Chemically enhanced backwashes are performed in the same manner as normal backpulse sequences, however, during backpulsing sodium hypochlorite is injected into the backpulse header. The sodium hypochlorite injection rate is intended to create a concentration in the chemically enhanced backwash of approximately 1,000 ppm, that when blended in the tank is approximately 250 ppm.

3.2.2.5 Air Scour System

During backpulse sequences, air is injected into the cassette frame via low pressure high volume blowers. Air scour is induced into the bottom of the membrane tanks to agitate and help abrade, lift, and remove fouling from the membrane fiber exteriors during the cleaning sequences. Air scour occurs in a 10-seconds on, 10-seconds off cycle during permeate sequences. Air scour blowers and discharge piping are shown in Figure 3-13.

FIGURE 3-13. AIR SCOUR SYSTEM

3.2.2.6 Membrane Integrity Testing

Membrane integrity is required to be monitored via two methods, including indirect and direct methods. Indirect methods include particle counters and/or turbidimeters. These measurements are used as a surrogate as verification that filtration is being accomplished at least quarterly. The Glenns Ferry WTP uses both methods, but primarily monitors permeate turbidity as particle counters are prone to fouling due to air bubble entrainment. The plant is configured such that each train is monitored individually. To ensure that public health is protected and the membranes remain undamaged, direct integrity testing is conducted daily on each membrane.

Direct integrity testing measures the amount of air leakage to identify membrane damage. During the integrity test, high pressure air is fed to the inside of the membrane fibers (also referred to as the lumen side or the filtrate side). Visual air leakage can be used to identify specific damaged areas, while the rate of air pressure loss can be used to measure the overall amount of damage to the membrane system. The leak rate, commonly referred to as pressure decay rate, correlates well with the theoretical log removal value. Greater air loss is indicative of more or larger holes in the membranes, which could allow more virus and bacteria particles to pass through the membranes. A passing or failing test is indicated on the SCADA reporting system.

3.2.3 Disinfection

Free chlorine is used to achieve the additional 1-log giardia inactivation required for disinfection, following the membrane filtration (MF) system. The system is designed for a minimum water temperature of 1° C, pH of 9.0 max, with 0.4 ppm free chlorine residual. An onsite generation sodium hypochlorite solution is used in place of chlorine gas due in part to the large quantities of onsite gas storage that would be required at the treatment plant, and the safety concerns associated with gaseous chlorine.

Chlorine is fed into the filtered water as it enters the chlorine contact basin. The 48,000 gallon basin is sized to provide a minimum of 480 minutes of contact time, with an effective time of 70 percent, or 335 minutes. The CT (the concentration of disinfectant multiplied by residence time in the basin) is designed for the maximum day flow in order to provide adequate disinfection.

Sodium hypochlorite is dosed into the MF permeate pipeline via a static mixer before entering the chlorine contact tank. The inflow to the chlorine contact basin is baffled to create turbulence and more thorough mixing. Once in the basin, the flow will follow a serpentine path in order to meet the required residence time. The outlet has a fixed weir to maintain a constant water volume. The basin is not partitioned and must be completely taken off-line for maintenance.

Sodium hypochlorite is generated onsite using a Clor-Tec onsite generation system. The system generates a 0.8% solution strength that is then stored in a bulk HDPE tank.

The chemical feed system utilizes Watson-Marlow peristaltic pumps to inject chlorine into the filter permeate. A second pump is used to inject sodium hypochlorite into the filter system during chemically enhanced backwash sequences. The sodium hypochlorite feed system is shown in Figure 3-14. Table 3-2 summarizes the sodium hypochlorite disinfection equipment used by the Glenns Ferry WTP.

FIGURE 3-14. SODIUM HYPOCHLORITE ONSITE GENERATION SYSTEM

TABLE 3-2. SODIUM HYPOCHLORITE SYSTEM SIZING

Design Parameter	Value
Number of Chlorine Contact Basins	1
Chlorine Contact Basin Size	48,000 gallons
Number of Hypochlorite Disinfection Feed Pumps	2 (1 duty, 1 standby)
Design Chlorine Dose	0.4 to 1 mg/L
Sodium Hypochlorite Storage Tank	550 gallons
Sodium Hypochlorite Solution Strength	0.8% (nominal)

3.2.4 Finished Water Pumping

The finished water pump station is located downstream of the chlorine contact chamber in a finished water clearwell. The level of the clearwell is allowed to fluctuate, depending on WTP feed rate and finished water pumping rate. The pumps are vertical turbine pumps housed in the northwest corner of the WTP. The finished water pumps discharge through a plant flow meter. Finished water analyzers monitor pH and residual chlorine from a sample line on the finished water pump discharge manifold and are monitored by the SCADA system. Plant operators monitor chlorine residual every four hours to verify adequate disinfection is occurring.

The pumping station consists of a single duty pump with a second standby pump as shown in Figure 3-15. The design criteria for both of the pumps are identical with a motor nameplate horsepower of 60, operating capacity of 750 gpm, and design Total Dynamic Head of 232 feet. Nominal (firm) operating capacity of the pump station is approximately 750 gpm (1.08 mgd) with one pump operating and the second on standby.

FIGURE 3-15. FINISHED WATER PUMP STATION

3.2.5 Compressed Air Support Systems

Multiple plant systems are operated pneumatically, including membrane integrity testing and process actuated control valves. The pneumatic air system is pressurized by two (one duty, one standby) rotary screw air compressors. Each compressor is rated at 36 SCFM at 100 psi. The compressors pass pressurized air through a series of oil and water filters as well as air dryers/conditioners before being distributed throughout the plant. The compressed air system is shown in Figure 3-16.

FIGURE 3-16. COMPRESSED AIR SYSTEM

3.2.6 Backwash and Residual Handling

The backwash treatment design includes several steps to minimize wastewater disposal and to capture plant residuals. The process is intended to operate as follows:

- The backwash settling basins use gravity sedimentation to settle out solids rejected by the membranes. Once settled, the "clarified" backwash flows back to the front of the plant and is blended with the raw river/spring water at the WTP fore bay.

- Periodically, the backwash settling basins will be drained and settled solids will be allowed to sufficiently dry, and can then be transferred to an off-site landfill.

The facility currently does not utilize the sedimentation basins due to vector concerns associated with the stagnant water. All backwash water is being sent to the sewer system.

3.2.7 Laboratory

The Glenns Ferry water treatment plant was designed with the expectation that the District will use the facility for daily water quality sampling, and will use a certified laboratory to

analyze samples for regulatory reporting. The laboratory is outfitted with a pH and conductivity meter, and a chlorine residual colorimeter. Additional cabinet space is provided for supplies including reagents for the colorimeter. The lab includes a mini refrigerator for sample chilling and some glassware.

3.2.8 Electrical and SCADA

3.2.8.1 Electrical and Power

Electrical panels are housed in the "Electrical Room" in the southeast corner of the facility. Power is distributed from the primary 480V service to 220V and 110V panels for lighting and convenience receptacle circuits. GE/Zenon I/O is routed from each of the membrane process trains to Train Panels 1 and 2. Common plant I/O (such as blowers, compressors, etc.) are passed to a third common I/O panel that houses the plant touch-screen control panel.

The City currently has no back-up power generators for its water system.

3.2.8.2 Control System

The membrane treatment system utilizes a control panel for control of the MF system and MF support systems. The membrane control panel includes a human machine interface (HMI) system. A separate plant control computer is used to manage the remaining plant automation. The plant control computer coordinates the automated processes in the facility with those provided by the membrane system.

All major unit operations send signals to the master SCADA system through the plant control computer. An overall summary of plant operations can be viewed on a PC-based SCADA system located in the laboratory office on the second floor of the treatment plant building. The operator interfaces with the computer using an HMI system.

3.2.9. Operations Staff and Managerial Responsibilities

The Glenns Ferry WTP has staff that oversees the maintenance and operations of the water treatment, distribution, and storage systems. Many processes at the treatment plant are automated to minimize operator involvement. The plant is staffed up to eight hours per day, seven days per week. An alarm system calls the operator if there is a problem at the plant.

The City currently has two operators, each with Class II licenses, and are IDEQ certified to operate the facility.

3.3 WATER DISTRIBUTION SYSTEM AND STORAGE

3.3.1. Distribution Piping

The City's water distribution system consists of about 94,540 feet of pipe ranging in size from 2 inches to 14 inches. The pipes within the system are made up of a variety of different materials, including PVC, steel, cast iron, ductile iron, galvanized steel, and HDPE. Much of the system is greater than 50 years old, and has exceeded its design life.

3.3.2. Pressure Zones

The distribution system consists of a single pressure zone. Pressurization comes from pumps at the WTP which pump water into the distribution system. Surplus water goes to the water storage tank (reservoir), which is located on an adjacent hill such that the system will remain above 20 psi during a power outage.

3.3.3. Storage Reservoir

The City of Glenns ferry added an A.O. Smith bolted epoxy coated steel water storage tank with Alumadome roof in 1999. The tank has a nominal diameter of 39 feet and contains approximately 500,000 gallons. The new tank replaced two tanks of approximately 250,000 gallons each. Figure 3-17 shows the new 500,000 gallon tank. The tank site is large enough to house additional storage tanks when needed.

The new tank is located north of the City, with a base elevation of approximately 2,678 feet above mean sea level, as shown on the 1999 project construction drawings. The tank's base elevation is about 90 feet above the center of town, providing system pressure during a power outage.

A 2007 water project involved the installation of a new 14 inch HDPE supply line to the storage tank. The new water supply line commences between old Hwy 30 and Interstate 84, then travels under the Interstate and up to the tank. This work was commissioned to assure fire flow to the city during a power outage or other catastrophic event.

FIGURE 3-17. 500,000 GALLON STORAGE TANK

3.4 WATER USER RATES

Table 3-3 summarizes the existing user rate schedule for the City of Glenns Ferry. These rates were established in February of 2013 (see Resolution in Appendix A). As shown, users are charged a variable monthly base rate based on the size of their meter. A constant rate of $1.90 is charged per 1,000 gallons of water used for each meter size, on top of the associated base rate.

TABLE 3-3. EXISTING USER CHARGE RATES

Meter Size (inches)	Multiplier	Base Rate	Rate per 1,000 Gallons
3/4 or Smaller	1	$36.00	$1.90
1	1.8	$64.80	$1.90
1 1/4	2.8	$100.80	$1.90
1 1/2	4	$144.00	$1.90
2	7	$252.00	$1.90
3	16	$576.00	$1.90
4	28	$1,008.00	$1.90

The water system budget for 2012-2013 is included in Appendix B. This includes operation and maintenance, personnel, and overhead expenses.

3.5 WATER QUALITY

Regulatory statutes require the City to routinely sample the water supply for various water quality parameters. These parameters include nitrates, inorganic constituents, lead, copper, radiological constituents, and disinfection byproducts, to name a few. A review of the data indicates that most of the constituents currently monitored are within the recommended State and Federal Drinking water standards. In addition, according to City personnel, there have been no persistent customer complaints regarding water quality. Table 3-4 below, summarizes the general water quality data for the system based on analyses of water samples from 2004-2013. The table shows Primary IOCs, Secondary IOCs, nitrate, and nitrite.

Table 3-5 summarizes the radiological results for the water system based on data collected from 2001-2014. The water supply meets the MCL for all of the radiological constituents.

Chlorination of drinking water supplies has the potential to introduce disinfection byproducts (DBP) into the system. Table 3-6, shown below, summarizes the DBP data for the years 2011-2014.

TABLE 3-4. WATER QUALITY: IOCs, NITRATE, AND NITRITE

Parameter		Units	Summary Statistics			MCL	Exceeds MCL?
			No. (N)	Average	Max		
Primary IOCs							
	Antimony	mg/L	9	ND	ND	0.006	No
	Arsenic	mg/L	10	0.0009	0.003	0.01	No
	Barium	mg/L	9	0.0189	0.03	2	No
	Beryllium	mg/L	9	0.0001	0.0013	0.004	No
	Cadmium	mg/L	9	ND	ND	0.005	No
	Chromium	mg/L	9	0.002	0.005	0.1	No
	Mercury	mg/L	9	ND	ND	0.002	No
	Nickel	mg/L	9	0.0131	0.103	-	No
	Selenium	mg/L	9	0.0003	0.0013	0.05	No
	Thallium	mg/L	9	ND	ND	0.002	No
	Fluoride	mg/L	10	0.402	0.53	4	No
Secondary IOCs							
	Chloride	mg/L	2	42.5	42.5	250	No
	Iron	mg/L	4	ND	ND	0.3	No
	Manganese	mg/L	4	ND	ND	0.05	No
	Dissolved Solids	mg/L	4	673	708	500	**Yes[1]**
	Hardness	mg/L	2	379	379	-	No
	Lead	mg/L	3	0.0022	0.0027	0.015	No
	Copper	mg/L	3	0.0374	0.0464	1.3	No
	Sulfate	mg/L	2	98.5	98.5	250	No
	Sodium	mg/L	9	48.3	56.8	-	No
Nitrate (as N)		mg/L	27	5.45	7.26	10	No
Nitrite (as N)		mg/L	5	ND	ND	1	No

1. National Secondary Drinking Water Regulations are non-enforceable guidelines regarding contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. EPA recommends secondary standards to water systems but does not require systems to comply.
2. ND = Non-Detect
3. Data from 2004-2013 (http://dww.deq.idaho.gov/)

Turbidity of the treated water is also tracked at the WTP. Turbidity of the treated water has continually been very low, as seen in Table 3-7 which summarizes turbidity readings for the years 2009-2013.

TABLE 3-5. WATER QUALITY: RADIOLOGICAL CONSTITUENTS

Contaminant Name	Units	Average of Result	Max of Result	# of Records	MCL
Beta/Photon Activity	pCi/L	8.1	11	4	4[1]
Gross Alpha Activity	pCi/L	6.55	8.1	4	15
Radium 226	pCi/L	0.625	1.4	3	5 combined
Radium 228	pCi/L	0	0	1	5 combined
Uranium, Combined	pCi/L	3.6	3.6	1	15

1. MCL reported in millirems/year and the result is in picoCuries/liter. The sample only needs to be analyzed further if the result is greater than 50 picoCuries/liter.
2. Data from 2001-2012 (http://dww.deq.idaho.gov/)

TABLE 3-6. WATER QUALITY: DISINFECTION BYPRODUCTS

Disinfection Byproduct Name	Units	Average of Result	Max of Result	# of Records	MCL
Haloacetic Acids (HAA5)	µg/L	11.8	31.4	39	60
Trihalomethanes (TTHM)	µg/L	39.0	80.5	39	80

1. Data from 2011-2014 (http://dww.deq.idaho.gov/)

TABLE 3-7. TREATED WATER TURBIDITY DATA

Year	Maximum Turbidity (NTU)
2009	0.048
2010	0.042
2011	0.037
2012	0.030
2013	0.041

3.6 SANITARY SURVEY

The Idaho Department of Environmental Quality (IDEQ) conducted a Sanitary Survey of the City's water system in June of 2011. The survey report found a few deficiencies and made several recommendations regarding leak control, water conservation, and cross connection control. A copy of the City's most recent IDEQ Sanitary Survey, including the IDEQ transmittal letter, can be found in Appendix C. The results of the Sanitary Survey indicate that the City's system will be in substantial compliance with the regulations for public drinking water systems when the significant deficiencies are corrected.

3.7 CONSUMER CONFIDENCE REPORT

A copy of the City's most recent Consumer Confidence Report can be found in Appendix D.

3.8 CROSS CONNECTION CONTROL

The City currently has a cross-connection control ordinance in place to protect the quality of its water supply (see Appendix E). As part of the cross-connection control program, backflow prevention devices are required on potential sources of contamination (i.e., service connections, irrigation lines). Personnel on the City staff have been trained in backflow prevention. The City has also developed a list of customers who have a potential for cross-connections or contamination of the water supply. This list is periodically evaluated and updated.

3.9 EXISTING WATER RIGHTS

The City has a total of seven water rights to supply municipal water, as summarized in Table 3-8. The total current water rights for municipal use is 17.57 cfs (7,886 gpm).

TABLE 3-8. WATER RIGHTS SUMMARY

Water Right Number	Priority Date	Basis	Source	Beneficial Use	Diversion Rate	
					(cfs)	(gpm)
37-8851	10/12/1995	Application	Bancroft Springs	Municipal	5.50	2,469
2-2209	2/25/1963	Statutory Claim	Snake River	Municipal	2.40	1,077
61-4141	1/1/1917	Statutory Claim	Springs	Municipal	2.54	1,140
61-7228	5/21/1975	Statutory Claim	Ground Water	Municipal	0.45	202
2-7470	3/30/1996	Permit	Snake River	Municipal	1.00	449
2-7471	12/9/1996	Permit	Snake River	Municipal	3.00	1,346
61-7679	12/10/1992	Permit	Ground Water	Municipal	2.68	1,203

Chapter 4

Future Conditions

4.0 FUTURE CONDITIONS

4.1 FUTURE LAND USE AND DEVELOPMENT

The Glenns Ferry Planning Area represents a geographical area and population that the City can be expected to serve within a 20-year design period from 2014 to 2034 for water supply and treatment, and a 40-year design period from 2014 to 2054 for distribution. Sufficient land was included in the Planning Area to accommodate forecasted residential, commercial, and industrial growth, in addition to allowing some flexibility for future unforeseen growth in the community.

The future land use map is shown on the following page in Figure 4-1.

A review of the City's Comprehensive Plan and zoning map indicates that much of the city is zoned residential, with significant areas of industrial and commercial land near the railroad tracks and in the center of town. The City's industrial corridor is currently mostly vacant due to the Union Pacific leaving town in the 1970s, and the Idahoan potato processing facility closing down in 2008. The Curry Grain Facility has also been abandoned. The City is actively trying to lure new industries to the area.

It is anticipated that growth within the Planning Area for the 40-year design period will consist primarily of residential development, including infill within vacant areas of the existing City limits. It is also anticipated that additional commercial and industrial development will occur as the economy improves.

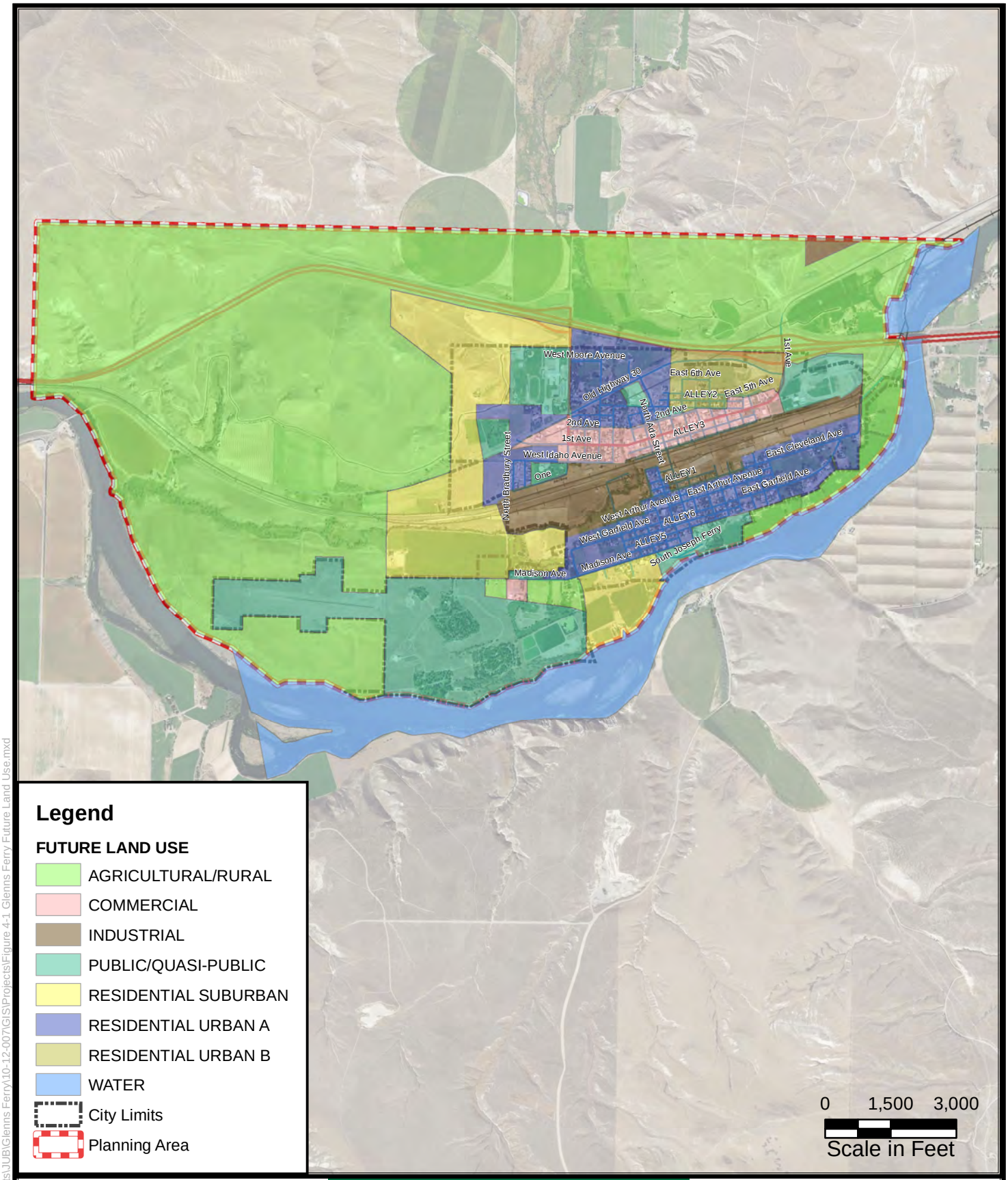
4.2 POPULATION PROJECTIONS

4.2.1 Historical Population Growth

Glenns Ferry's population has fluctuated relative to the available employment opportunities in the City. After the Union Pacific Railroad ceased their Glenns Ferry operations in the 1970s, more than 100 jobs were lost. In 2008 another 130 jobs were lost and many families were forced to relocate as a result of Idahoan potato plant closure.

Data from the U.S. Census Bureau indicates that Glenns Ferry had a larger population in 1930 than it does now. However, there was significant growth in the City from 1990 up until the economic collapse in 2008. In 2000, the City of Glenns Ferry had a population of 1,611 residents with a median age of 36 years. In 2010, the population was 1,319 with a median age of 43 years. As described above, there was an abrupt reduction in the City's population in 2008-2009 after the closure of the potato plant. The City's historical population is summarized in Table 4-1 below.

The population trend in Glenns Ferry has generally mirrored unincorporated Elmore County over the past 30 years. The notable exception in the region is Mountain Home, which has consistently enjoyed steady growth and has nearly doubled in population since 1980.



Legend

FUTURE LAND USE

- AGRICULTURAL/RURAL
- COMMERCIAL
- INDUSTRIAL
- PUBLIC/QUASI-PUBLIC
- RESIDENTIAL SUBURBAN
- RESIDENTIAL URBAN A
- RESIDENTIAL URBAN B
- WATER
- City Limits
- Planning Area

WATER SYSTEM FACILITIES PLAN

FIGURE 4-1

CITY OF GLENNS FERRY FUTURE LAND USE

J-U-B ENGINEERS, INC.

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8/25/2014

TABLE 4-1 – HISTORICAL POPULATION GROWTH

Year	Population [1]	Average Annual Percent Change
1920	1,243	
1930	1,414	1.38%
1940	1,290	-0.88%
1950	1,515	1.74%
1960	1,374	-0.93%
1970	1,386	0.09%
1980	1,374	-0.09%
1990	1,304	-0.51%
2000	1,611	2.35%
2010	1,319	-1.81%

1. Data from U.S. Census Bureau.

4.2.2 Seasonal Population Fluctuations

Although Glenns Ferry is located within an agricultural area, the Planning Area experiences little, if any, seasonal population fluctuations due to an influx of migrant or other workers. The Planning Area does not contain a migrant labor center, as do some other communities in southern Idaho. As a result, almost all migrant and/or seasonal workers are housed on the farms on which they are employed, most of which are located outside the Planning Area. Therefore, Glenns Ferry does not experience any significant seasonal population changes due to agricultural practices in the area.

4.2.3 Growth Forecast

Due to the area's desirable location and proximity to the growing cities of Boise, Mountain Home, and Twin Falls, it is reasonable to assume that population growth will occur. This hypothesis is supported by the population spike from the 1990s up until the 2008 economic crash. The question of when and how quickly growth will occur is difficult to predict. Factors that affect population growth and housing construction include regional economic conditions, mortgage interest rates, gasoline prices, taxes, demographics, and job availability. It is possible that a new agriculturally based industry could open in the coming years, potentially restoring the population to the 2000 Census levels or higher.

Glenns Ferry is actively pursuing economic development opportunities by focusing on the following attributes that are unique to the city:

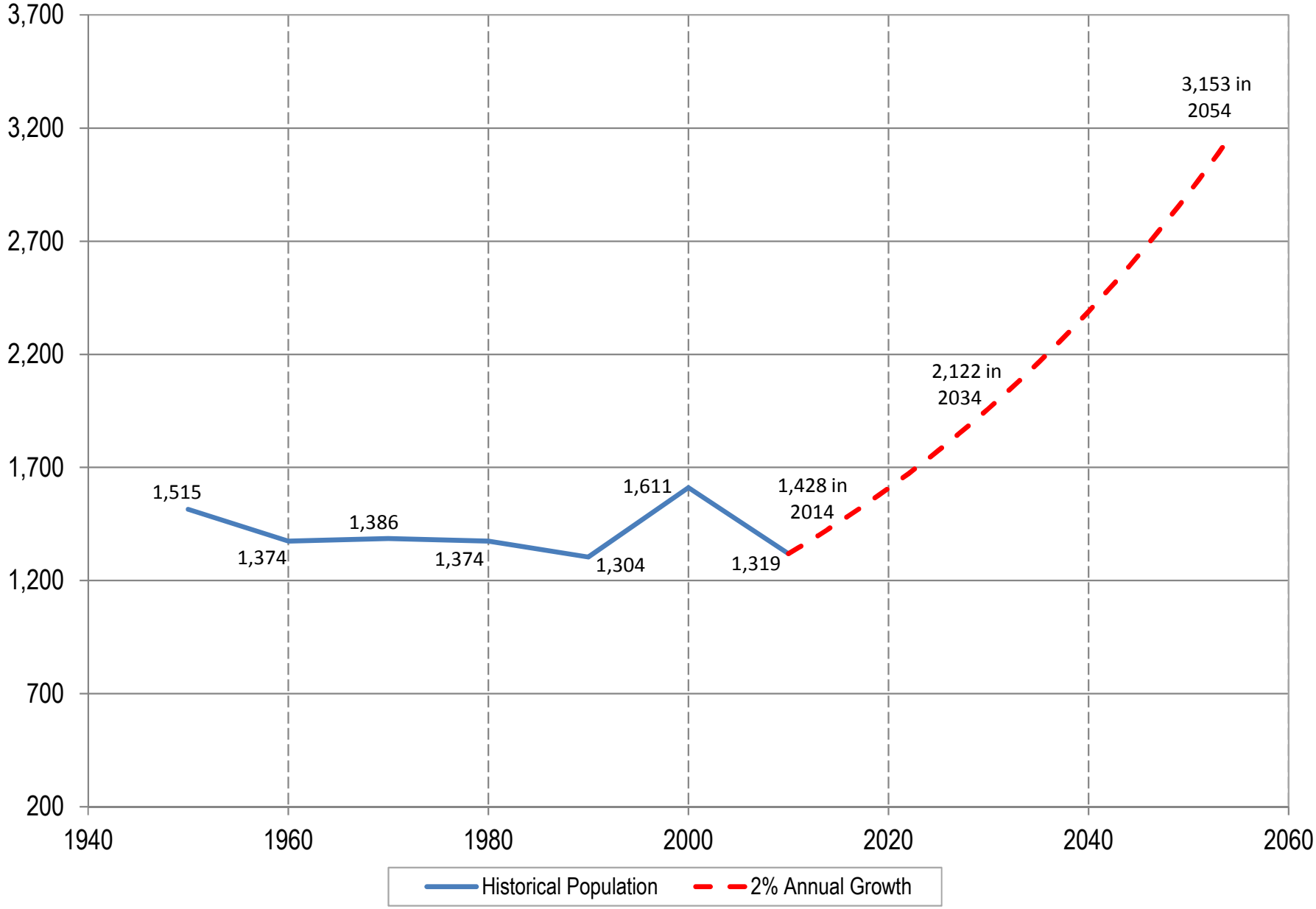
- Existing and proposed Industrial-zoned land with access to rail spurs
- Attractions such as the Carmela Winery and Golf Course
- Idaho-Oregon Snake River Water Trail plans
- Pedestrian Pathway Improvements
- Tourism
- Airport Improvements
- Corridor Enhancements, Signage, and Lighting
- Downtown Revitalization Efforts

- Convenient access to I-84
- Close to Mountain Home Air Force Base

Based on discussions with City personnel, it was determined that a 2 percent annual growth rate would be a reasonable assumption for the 20-year and 40-year planning periods. The 2% growth rate is also consistent with the City's current Transportation Master Plan and 2014 Wastewater Facilities Plan. Using this growth rate, it is projected that the City of Glenns Ferry will have 2,122 residents in the year 2034, and 3,153 residents in the year 2054. This represents an increase of 803 residents in 2034, or a population 61% greater than the 1,319 residents reported to be living in the city by the 2010 U.S. Census.

Figure 4-2 summarizes the historical population data in Glenns Ferry, and also shows the projected growth trend into the future. This population projection provides the basis for future water demands, which are then used to evaluate water system infrastructure needs.

FIGURE 4-2. GLENNS FERRY HISTORICAL POPULATION AND PROJECTED GROWTH



Chapter 5

Water Demand Analysis

5.0 WATER DEMAND ANALYSIS

5.1 NON-REVENUE WATER

As is typical of water distribution systems, Glenns Ferry has observed various amounts of non-revenue water. Non-revenue water is the difference between the water produced at the source and what is metered at the point of use. Non-revenue water can be attributed to un-metered connections or un-metered use, tank overflows, meter inaccuracies, accounting procedures, and leaks. Table 5-1 summarizes this non-revenue water over the past five years. The City has recently installed water meters on connections that were previously unmetered. This will help continue to reduce the amount of non-revenue water.

TABLE 5-1. NON-REVENUE WATER

Year	Metered Water (gallons)[1]	Water Pumped from WTP (gallons)[2]	Non-Revenue Water (gallons)	Percent Loss
2009	51,628,778	111,458,089	59,829,311	54%
2010	54,034,840	102,472,922	48,438,082	47%
2011	65,448,552	107,121,617	41,673,065	39%
2012	78,844,000	115,087,122	36,243,122	31%
2013	79,875,000	110,294,239	30,419,239	28%

1. As analyzed from the City's billing data where the City has accounts.
2. As analyzed from the WTP meter at the finished water pump station.

As can be seen from the data, the percentage of loss has gone down considerably each year over the past five years. This may be due to conservation efforts, elimination of leaks in the system as water lines are replaced and upgraded, and installation of upgraded or more modern equipment.

For the purpose of modeling the existing water system and projecting demands into the future, the amount of water pumped to distribution was assumed to be the system demand in order to be conservative. The City is encouraged to continue efforts to reduce non-revenue water to as low as possible through diligence in metering and repair of old infrastructure.

5.2 WATER DEMAND ANALYSIS

5.2.1 Equivalent Dwelling Units

As discussed at the beginning of Chapter 3, the City's existing water system serves a total of 585 active residential connections, 30 connections the City termed as 'inactive', and about 45 non-residential connections. Non-residential water use is normalized to residential water use by giving it an Equivalent Dwelling Unit (EDU). In Glenns Ferry, EDUs are assigned based on the size of the water meter for each connection, as set by the User Rate Resolution in Appendix A. The EDU value for each connection size can be seen in the "Multiplier" column of Table 3-3.

The table in Appendix F shows the size and number of EDUs for each connection larger than the standard 3/4 inch residential connection. From this, the total number of EDUs served by the City's water system is estimated to be approximately 748 EDUs (585 active residential EDUs and 163 non-residential EDUs).

5.2.2 Existing Demand

Daily water production data from the City's water treatment plant (WTP) was provided by the City for the period of January 2009 through August 2014. This production data was used to establish a basis for analyzing existing conditions and projecting future demands on the system.

Figure 5-1 shows the total volume of water produced by the WTP on a monthly basis over a period of several years. As shown in the figure, there are seasonal variations in the water demand over the course of a typical year. Demands are considerably higher in the summer due to landscape irrigation and higher in-house water uses during warm weather conditions (e.g., washing clothes, additional bathing, etc.). Further analysis indicates that the total water demand has been fairly stable since 2009, with a slight decrease from 2012 to 2013. This decrease in overall demand is likely attributed to a decreasing population of the City, loss of industrial water users, and possibly also due to conservation efforts and the growing implementation of secondary water systems for irrigation purposes.

Based on historical water meter data provided by the City, the highest annual water users within the City include the Syringa Court public housing, Three Island State Park, Poplar Grove Assisted Living, Glenns Ferry School #192, and Carmela Vineyards. The average daily water use based on the meter data is presented in Table 5-2.

TABLE 5-2. LARGE WATER USERS

Name	Demand (gpd)
Syringa Court Public Housing	9,000
Three Island State Park	3,400
Poplar Grove Assisted Living	2,450
Glenns Ferry School District #192	2,300
Carmela Vineyards	1,900

In a community the size of Glenns Ferry, water consumption over the course of a typical day may vary dramatically. Variations are generally most noticeable in residential flows, which increase or decrease in response to the community's daily routine. The curves showing the magnitude of the variations over time are generally diurnal in shape, peaking in the late morning and during the evening. Large commercial and industrial water demands could skew the diurnal curves. However, Glenns Ferry is mostly a residential community and it is expected that the water demand throughout the day would show the diurnal curves typical for bedroom communities. In order to account for daily variations in water demand, maximum day and peak hourly peaking factors must be applied to the average day demand.

Historical water production data from 2009-2013 was used to determine the average day demand, maximum day demand and peaking factors for the Glenns Ferry system. The current demand data for average day conditions were then extrapolated to the years 2034 and 2054 with the existing peaking factors re-applied to the projected future average demand.

The demands used to analyze the existing system of Glenns Ferry, and to plan for the future infrastructure sizing, include the max day demand and peak hour demand. The maximum day demand is typically used to evaluate the amount of sustainable water supply required from the City's sources. The peak hour demand is used in calculating water storage requirements, booster pump station capacity, and distribution line sizing. Since the flow data is based on a single daily water meter reading at the treatment plant, the peaking factors required for these analyses (i.e., maximum day demand and peak hour demand) were not readily apparent and had to be estimated using the average day demand.

5.2.2.1 Average Day Demand

In order to determine the average day demand, the daily flow data from the WTP from 2009 to 2013 was reviewed and averaged. This process resulted in an average day demand of approximately 310,790 gallons per day (216 gpm).

5.2.2.2 Maximum Day Demand

Similar to the process used to determine the average day demand, the maximum day demand was determined from the past five years worth of WTP production data. This process involved locating the single largest production in a single day, which was found to be 612,396 gallons per day (453 gpm). The actual peaking factor for average day demand to maximum day demand was then calculated by dividing the maximum day value by the average day value determined previously, which resulted in a peaking factor of 2.09. This peaking factor is similar to other communities in Southern Idaho. Recent analyses of the Filer, Jerome, and Twin Falls water systems yielded maximum day peaking factors of 2.51, 2.4, and 2.3, respectively. For the purposes of projecting maximum day flow demands into the future, an average day to maximum day peaking factor of 2.1 was assumed.

5.2.2.3 Peak Hour Demand

The City of Glenns Ferry does not currently track hourly production at the water treatment plant. Therefore, a peak hour demand could not be pulled directly from production data, but had to be assumed. It was assumed that the peak hour flows are twice the max day demand, resulting in a maximum day to peak hour peaking factor of 2. This assumption is a conservative estimate based on other similarly sized systems in the area. Applying this peaking factor resulted in a peak hour demand of 906 gpm, which is larger than the plant capacity (750 gpm or 1.08 mgd). Dividing this demand by the average day demand resulted in an average day to peak hour peaking factor of 4.2.

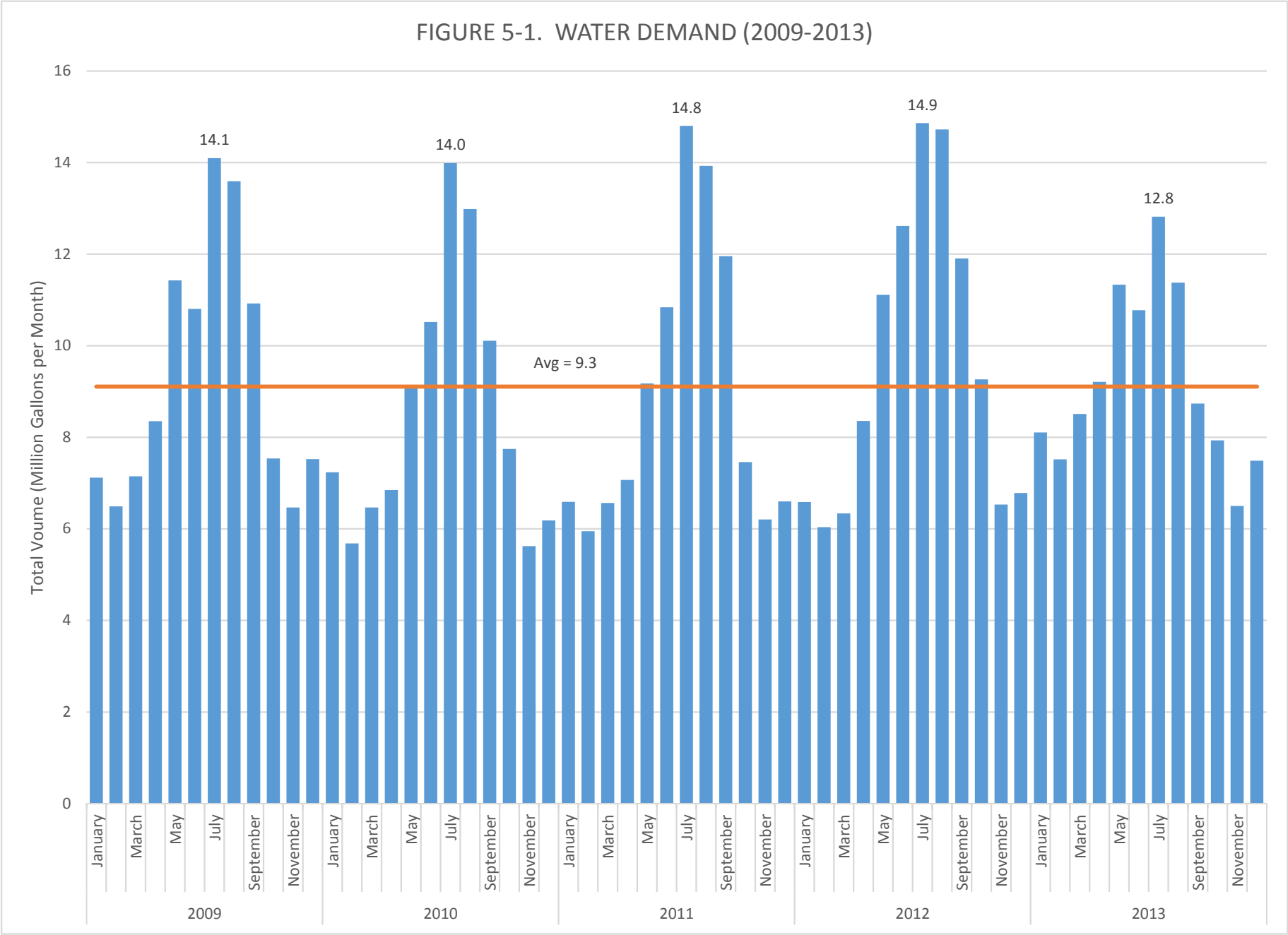


FIGURE 5-1. WATER DEMAND (2009-2013)
Total Voume (Million Gallons per Month)
16
14
12
10
8
6
4
2
0
14.1
14.0
14.8
14.9
12.8
Avg = 9.3
January
March
May
July
September
November
2009
2010
2011
2012
2013

5.2.2.4 Summary of Existing Demands

Table 5-3 summarizes the water demands from the City's water system for 2009-2013.

TABLE 5-3. HISTORICAL WATER DEMAND

Year	Flow (gallons/year)	Flow (gallons/day)	Flow (gpm)
2009	111,458,089	305,365	212
2010	102,472,922	280,748	195
2011	107,121,617	293,484	204
2012	115,087,122	314,446	218
2013	110,294,239	302,176	210

As mentioned previously, since the last five years have been relatively consistent in terms of water use, an average of the 2009-2013 data was used to estimate the existing water demand in the City. Table 5-4 summarizes the existing water demand.

Based on data from several other communities in southern Idaho, the average day per capita demand is typically 300 gallons per person per day or greater. As such, Glenns Ferry's per capita demand of 218 gallons per person per day is lower than typically observed in southern Idaho. This is most likely due to a comparatively small industrial and commercial base served by the system, as well as a pressure secondary irrigation system that serves parts of the town.

TABLE 5-4. EXISTING WATER DEMAND

Parameter	Units	Water Demand
Average Day Demand	gpm	216
Average Day per-Capita[1]	gpcd	218
Average Day to Maximum Day Peaking Factor		2.10
Maximum Day Demand	gpm	453
Average Day to Peak Hour Peaking Factor		4.2 (2 times max day)
Peak Hour Demand	gpm	906
Total Annual Volume	Mgal	113

1. The per capita value reflects all water demands (residential, commercial, industrial, etc.)

5.2.2.5 Irrigation Demand

In addition to daily variations, there are also seasonal fluctuations in water use. These fluctuations occur primarily in response to irrigation practices within the community since the City supplies both domestic and irrigation water through its drinking water system. Converting landscape irrigation to secondary water supplies can reduce demand on the drinking water system during the months of highest water use.

Typically, potable water demand in the City is highest during the summer when irrigation occurs more frequently, and lowest during the winter when irrigation is minimal. Figure 5-2 illustrates the annual fluctuation in water demand in terms of total volume (million gallons) for the 6-month irrigation season (May through October) as compared to the non-irrigation season (November through April).

Table 5-5 reiterates that the average day demand during the irrigation season is significantly greater than the non-irrigation season demand.

TABLE 5-5. IRRIGATION FLOWS (2009-2013)

Season	Average Day Demand (gpm)
Irrigation Season (April - October)	245
Non-Irrigation Season (November - March)	154

The City is working to increase the expansion and utilization of the secondary water system for landscape irrigation. This would help the culinary water system by lessening the demand on the system during the typically high demand summer months, therefore freeing up capacity for other uses such as industrial. Storage and distribution line sizes would be unchanged by this decrease in summer month culinary water usage because they are primarily driven by fire flow demands.

Figure 5-3 shows water demand by month from 2009-2013. It also shows the average day demand based on the 2009-3013 data for comparison.

5.2.2.6 Fire Flow Demand

The Idaho Survey and Ratings Bureau (ISRB) recommends "needed fire flows" based on guideline values established by the Insurance Services Office, Inc. (ISO). ISO sets the "needed fire flow" guideline values for various structures within a community based on the type of building construction, size of building, occupancy factors, and proximity of buildings. These values are used primarily for insurance purposes, and are not enforceable requirements. Most communities strive to provide the guideline fire flows to reduce insurance costs to the individual rate payers. Based on recent discussions with the ISRB, Table 5-6 summarizes the recommended "needed fire flows" for the structures within the City requiring the greatest fire flow protection. The full ISRB requirement list is provided in Appendix G. Figure 5-4 shows the locations of several of the highest ISRB fire flows.

In addition to the ISRB recommended fire flows, the Uniform Fire Code requires a basic fire flow of 1,000 gpm for a two hour duration for basic residential structures of less than 3,600 square feet.

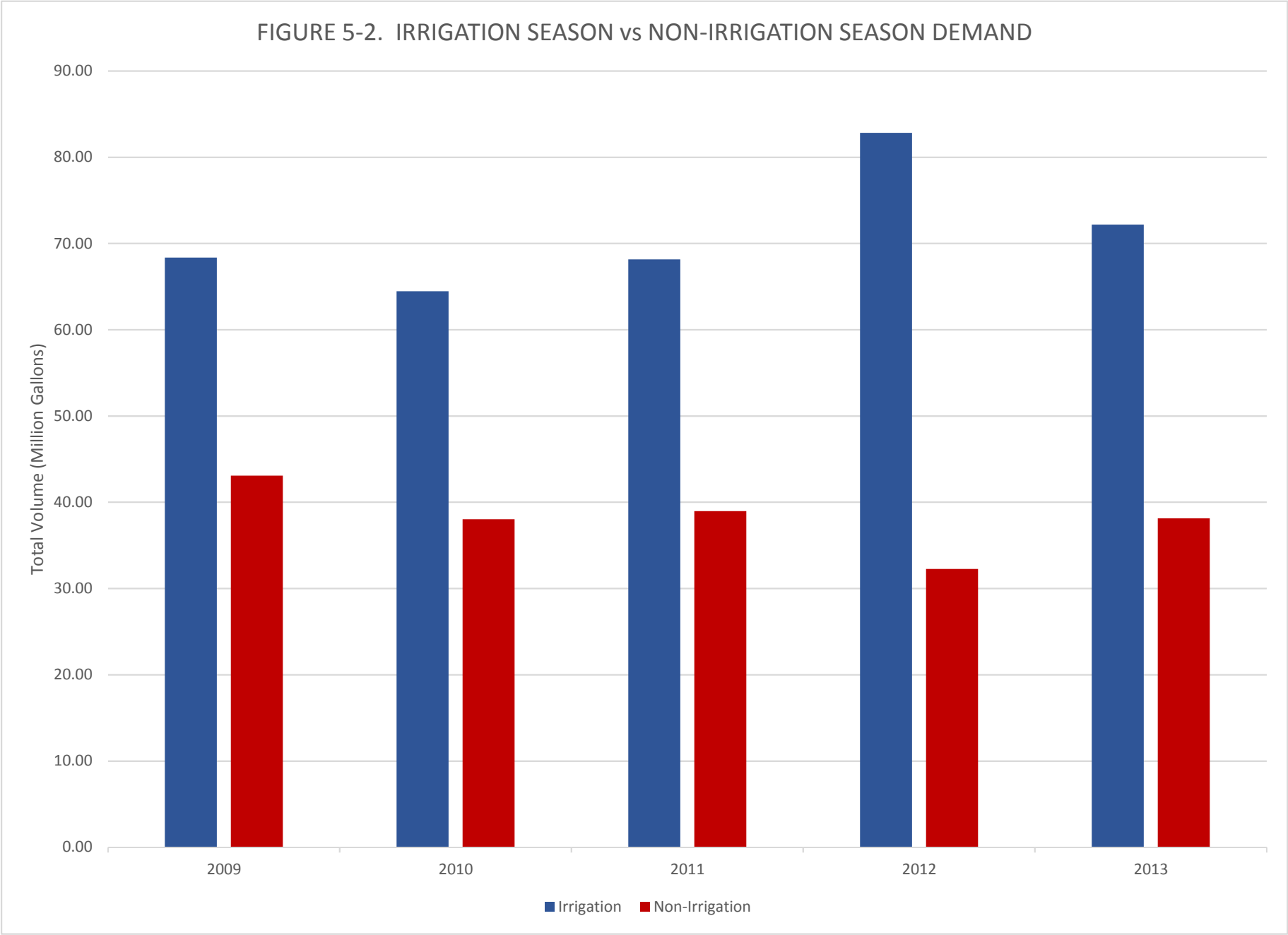


FIGURE 5-2. IRRIGATION SEASON vs NON-IRRIGATION SEASON DEMAND
Total Volume (Million Gallons)
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
2009
2010
2011
2012
2013
Irrigation
Non-Irrigation

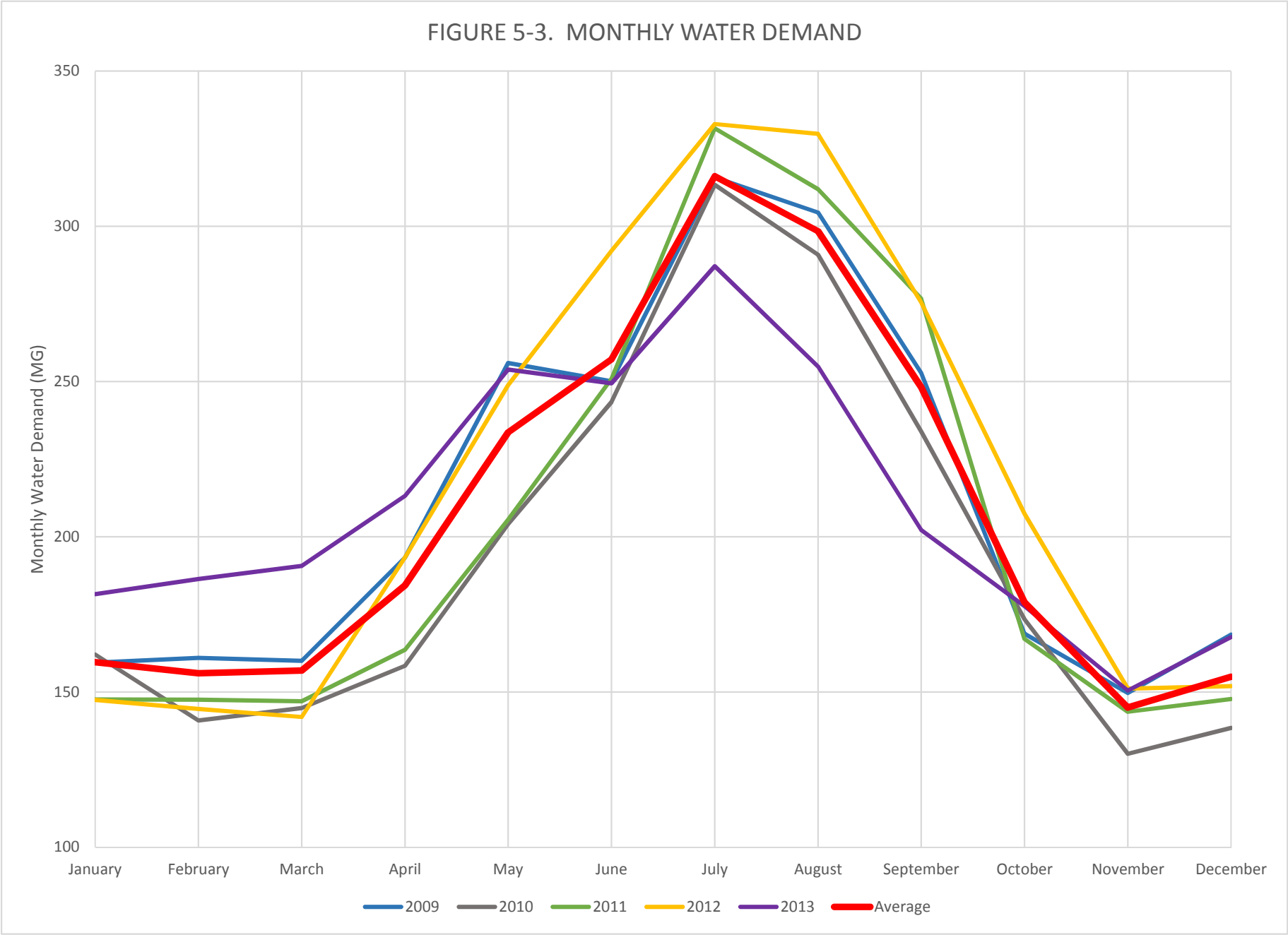


FIGURE 5-3. MONTHLY WATER DEMAND
Monthly Water Demand (MG)
350
300
250
200
150
100
January
February
March
April
May
June
July
August
September
October
November
December
2009
2010
2011
2012
2013
Average

TABLE 5-6. ISRB RECOMMENDED FIRE FLOWS

Location	Address	Fire Flow Requirement (gpm)	Duration (hours)
Idahoan Foods Inc.[1]	600 E. Harrison Ave.	5500	4
Carmela Winery (NJOY LLC)	1299 W. Madison Ave.	3000	3
Worldwide Equine, Inc.	415 E. 4th St.	2000	2
City of Glenns Ferry[2]	211 W. Arthur St.	2000	2
Glenns Ferry Veterans Hall	132 E. 5th Ave.	1750	2
Glenns Ferry School (School District No. 192)[3]	639 Bannock Ave.	1500	2
Three Island Senior Citizen Center	492 E. Cleveland Ave.	1500	2
Stew's Place (Tracy Stewart)	28 E. Idaho Ave.	1250	2
Hanson's Café	102 E. 1st Ave.	1250	2

1. The Idahoan Foods Inc. potato processing plant is not in active operation at the time of this publication.
2. This refers to the old Glenns Ferry School that is no longer in use.
3. This is the City's combined elementary, junior high, and high school.

5.2.2.7 Comparison of Calculated Water Demand to IDAPA Requirements

IDAPA regulations (58.01.08 Part 552.01) state that "the capacity of a public drinking water system shall be at least 800 gallons/day/residence and that this shall be the design maximum day demand rate exclusive of irrigation and fire flow requirements".

Using an estimated 585 residences (see Chapter 3) and the 800 gallons/day/residence required by IDAPA results in a maximum day water demand of 468,000 gallons/day, or 325 gpm. This is significantly less than the calculated maximum day demand of 453 gpm currently placed on the system. The 128 gpm difference is available to accommodate the City's irrigation needs. Fire flow demands are addressed using the City's water storage tank. Therefore, the calculated water demands using actual data resulted in a more conservative assessment than what is required by IDAPA regulations. As a result, the projected flow rates into the future were estimated using actual data rather than IDAPA design recommendations.

5.2.3 Future Water Demand

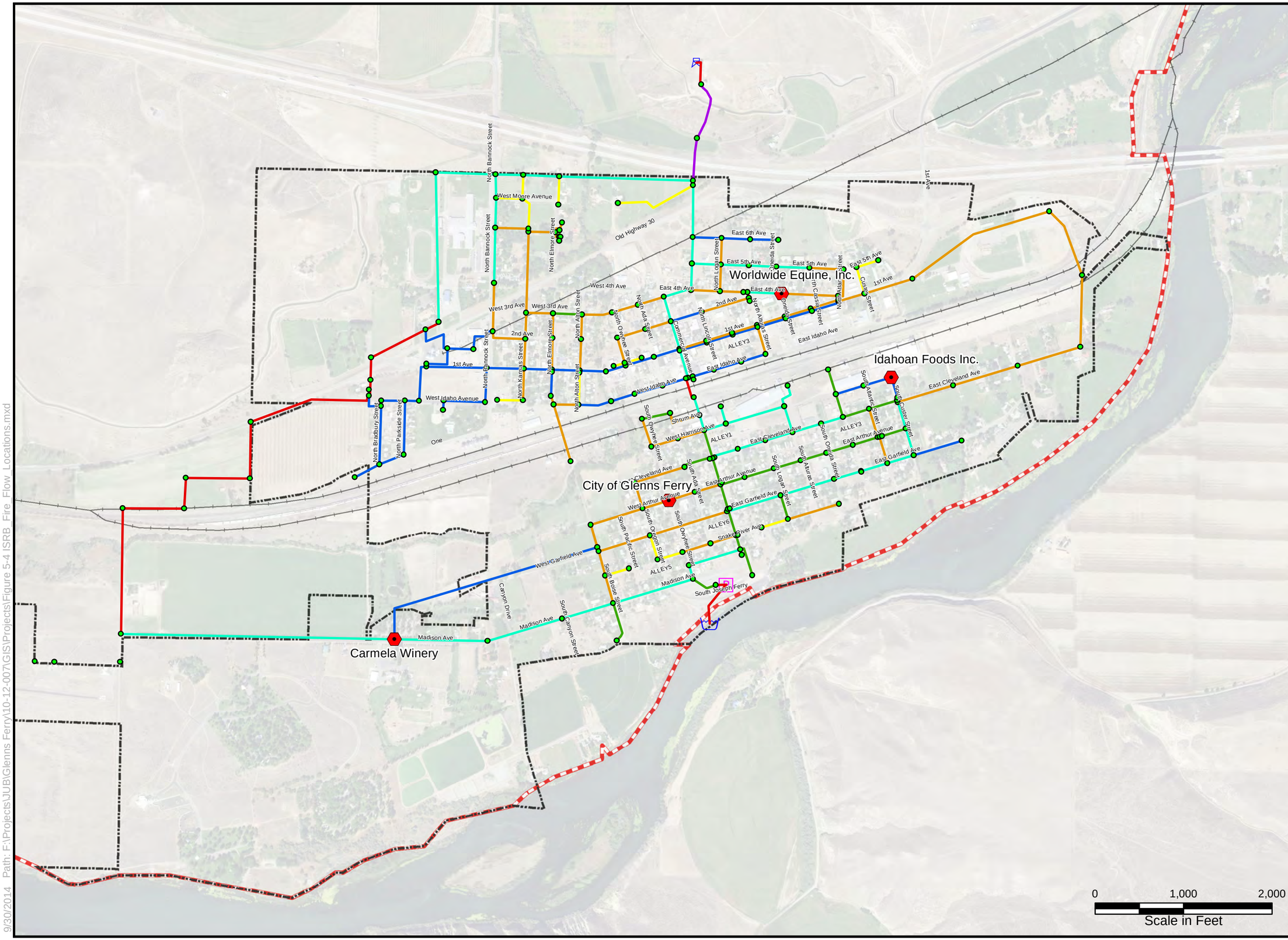
5.2.3.1 Future Water Demand Projection

Water demand was projected 20 years into the future to analyze system sources, treatment, and storage; and 40 years into the future to analyze the distribution system piping. This was done by multiplying the existing per-capita flow (218 gpcd) by the projected population in 2034 (20 years) and 2054 (40 years). It was assumed that the peaking factors for maximum day demand (2.1) and peak hourly demand (4.2) would remain the same throughout the 40-year planning period. Table 5-7 summarizes the year-by-year flow projections.

FIGURE 5-4

CITY OF GLENNS FERRY ISRB HIGH FIRE FLOW LOCATIONS

WATER SYSTEM FACILITIES PLAN



Legend

ISRB High Fire Flow Locations
(2,000 gpm or greater)

DIAMETER, MOTYPE
- 2
- 4
- 6
- 8
- 10
- 12
- 14

Tank

Water Supply

Pump

City Limits

Planning Area

J-U-B ENGINEERS, INC.

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9/30/2014 Path: F:\Projects\JUB\Glenns Ferry\10-12-007\GIS\Projects\Figure 5-4 ISRB Fire Flow Locations.mxd

TABLE 5-7. YEAR-BY-YEAR WATER DEMAND PROJECTIONS

Year	Population	Average Day Demand (gpm)	Maximum Day Demand (gpm)	Peak Hourly Demand (gpm)
2014	1,428	216	453	906
2015	1,457	220	462	925
2016	1,486	225	472	943
2017	1,515	229	481	962
2018	1,546	234	491	981
2019	1,577	238	500	1,001
2020	1,608	243	510	1,021
2021	1,640	248	521	1,041
2022	1,673	253	531	1,062
2023	1,707	258	542	1,083
2024	1,741	263	552	1,105
2025	1,776	268	564	1,127
2026	1,811	274	575	1,150
2027	1,847	279	586	1,173
2028	1,884	285	598	1,196
2029	1,922	290	610	1,220
2030	1,960	296	622	1,244
2031	2,000	302	635	1,269
2032	2,040	308	647	1,295
2033	2,080	314	660	1,321
2034	2,122	321	673	1,347
2035	2,164	327	687	1,374
2036	2,208	334	701	1,401
2037	2,252	340	715	1,429
2038	2,297	347	729	1,458
2039	2,343	354	744	1,487
2040	2,390	361	758	1,517
2041	2,437	368	774	1,547
2042	2,486	376	789	1,578
2043	2,536	383	805	1,610
2044	2,587	391	821	1,642
2045	2,638	399	837	1,675
2046	2,691	407	854	1,708
2047	2,745	415	871	1,742
2048	2,800	423	889	1,777
2049	2,856	432	906	1,813

Continued on Next Page

2050	2,913	440	925	1,849
2051	2,971	449	943	1,886
2052	3,031	458	962	1,924
2053	3,091	467	981	1,962
2054	3,153	477	1,001	2,002

Chapter 6

Analysis of Existing and Future System

6.0 EVALUATION OF EXISTING AND FUTURE SYSTEM

The City of Glenns Ferry's drinking water system consists of two sources (the Snake River surface water intake and the spring fed infiltration gallery), one storage tank, a water treatment plant with distribution pumps, a distribution network, and a control system. A map of the water system is shown in Figure 3-1. All of the water system components are described in detail in Chapter 3. The following sections evaluate the condition of the individual water system components.

6.1 WATER SUPPLY

6.1.1 Snake River Surface Water Source

The City's Snake River source was developed in 2004 with the construction of the City's water treatment plant. The source was designed to supply about 750 gpm to the treatment facility.

6.1.2 Spring Fed Infiltration Gallery Source

The City's spring fed infiltration gallery was the system's sole source of raw water up until the construction of the microfiltration treatment plant in 2004. The infiltration gallery's firm capacity is estimated by City personnel to be somewhere between 500 - 1,000 gpm. The design capacity of the source's pumps are 750 gpm.

6.1.3 Supply versus Demand Analysis

Because all raw water from both of the system's sources must be treated by the water treatment plant, the firm water supply is based on several components of the system, including intake pumps, treatment processes, and distribution pumps. Table 6-1 below shows the capacity of each of these items, and identifies the overall firm water supply of the system.

Figure 6-1 shows the projected water demands versus the firm available water supply. As can be seen in the figure, the firm water supply is capable of handling the maximum day demand throughout the entire 20-year planning period.

The City's current water rights (7,886 gpm) are also adequate to meet the demands for the entire planning period.

6.1.4 Reserve Capacity

Table 6-2 below compares the system's firm capacity versus the projected maximum day demands to estimate the reserve capacity of the system throughout the 20-year planning period.

TABLE 6-1. WATER SYSTEM FIRM SUPPLY

Process	Possible Limiting Factors	Capacity (gpm)	Firm Capacity (gpm)
Snake River Intake	Duty Pump	750	750
	Standby Pump	750	
Infiltration Gallery Intake	Duty Pump	750	750
	Standby Pump	750	
Membrane Filtration	Filter Trains	833	833
Distribution System	Duty Pump	750	750
	Standby Pump	750	
Overall Firm Capacity			**750**

TABLE 6-2. WATER SUPPLY RESERVE CAPACITY

Year	Max Day Demand (gpm)	Firm Capacity (gpm)	Reserve Capacity (gpm)	Reserve Capacity in EDUs	% Reserve
2014	453	750	297	490	40
2020	510	750	240	395	32
2025	564	750	186	308	25
2030	622	750	128	211	17
2034	673	750	77	126	10

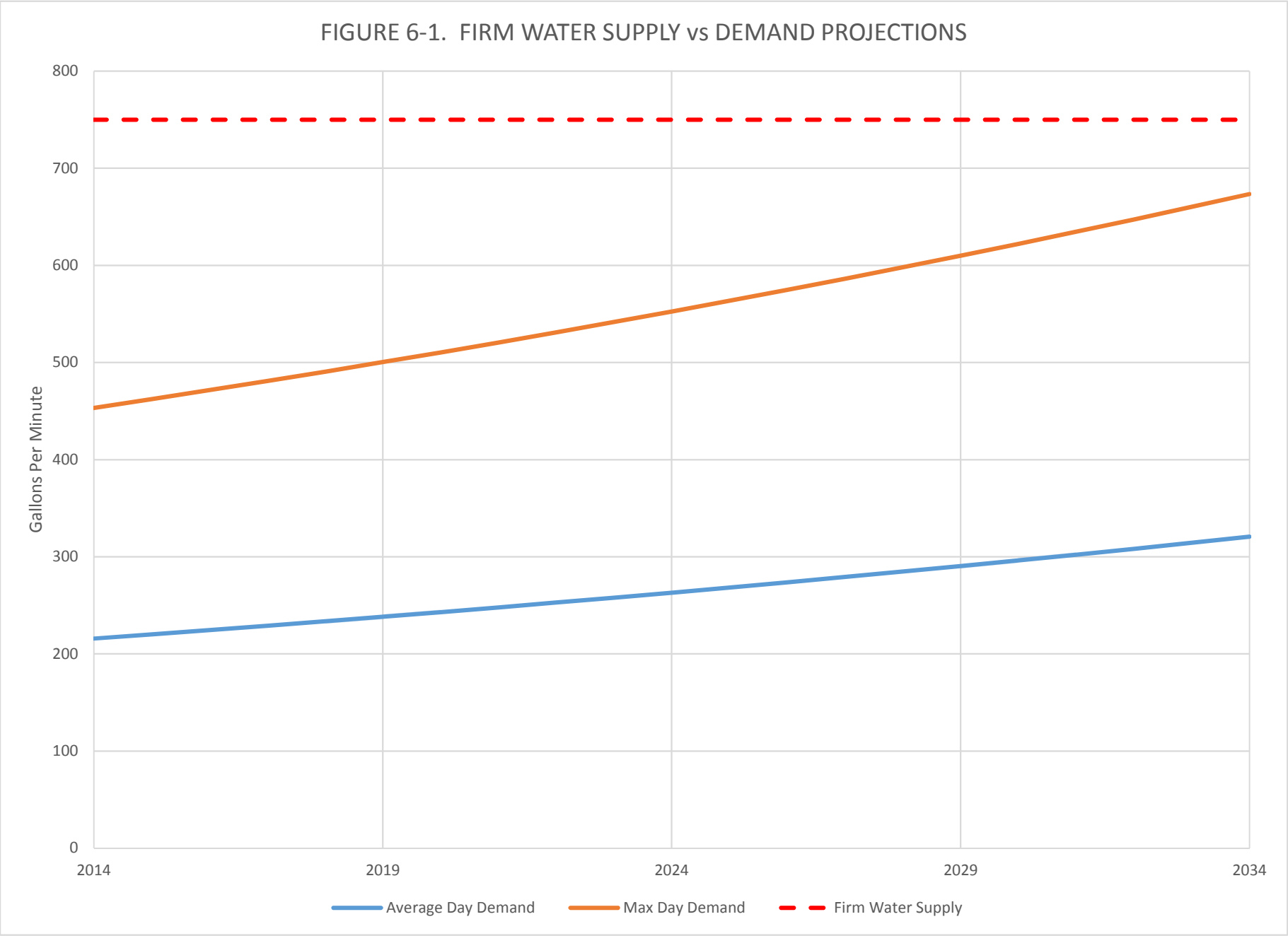


FIGURE 6-1. FIRM WATER SUPPLY vs DEMAND PROJECTIONS
Gallons Per Minute
800
700
600
500
400
300
200
100
0
2014
2019
2024
2029
2034
Average Day Demand
Max Day Demand
Firm Water Supply

6.2 WATER STORAGE

The City currently has one 500,000 gallon storage tank which is described in Chapter 3. The storage reservoir provides the following, as defined in IDAPA 58.01.08.003.16:

- Dead Storage (IDAPA 58.01.008.003.16a): Storage that is either not available for use in the system or can provide only substandard flows and pressures.

  The water storage reservoir does not have dead storage. All 500,000 gallons are available for use.

- Effective Storage (IDAPA 58.01.008.003.16b): Effective storage is all storage other than dead storage, and is made up of operational, equalization, fire suppression, and standby storage.

- Operational Storage (IDAPA 58.01.008.003.16c): Operational storage supplies water when, under normal conditions, the water sources are off.

  Operational storage, as defined in the regulation, varies. During the day, the fill elevation is maintained at 49 feet with the following operation levels. At approximately 48 feet the reservoir calls for water from the water treatment plant. The plant begins working and continues until the reservoir level reaches 49.5 feet. Upon achieving 49.5 feet of water, the water treatment plant shuts down. This volume equals 13,403 gallons.

  The evening and night protocol varies slightly from the daytime operation procedure. At 5 o'clock PM, a midnight fill cycle begins. The reservoir calls for water at 48 feet but continues demanding water until the tank's water level reaches 52 feet. The desired fill height normally occurs by midnight, but varies up to an hour before or after, depending on system demand. This volume equals 35,742 gallons.

- Equalization Storage (IDAPA 58.01.008.003.16d): Storage of finished water in sufficient quantity to compensate for the difference between a water system's maximum pumping capacity and peak hour demand.

  Equalization storage volume requirements were calculated using a formula recommended by IDEQ assuming a constant rate inflow. The equalization volume is based on a ratio of the source supply to the maximum day demand. If this ratio is greater than 1.75, no equalization storage is required.

  Qsource = 750 gpm
  Qmaxday = 453 gpm in 2014 and 673 gpm in 2034
  Qsource/Qmaxday = 1.66 in 2014
  Qsource/Qmaxday = 1.11 in 2034

  Since the Qsource/Qmaxday ratio is less than 1.75 for both 2014 and 2034, equalization storage is required both now and throughout the 20-year planning period. The volume of required equalization storage (ES) is calculated as:

  $$ES = 0.1 \times (\text{total volume on the max day})/24$$

Total max day volume in 2014 is 652,659 gallons, which results in a required equalization storage volume of 2,720 gallons. Total max day volume in 2034 is 969,818 gallons, which results in an equalization storage volume of 4,041 gallons being required for that year.

- Fire Suppression Storage (IDAPA 58.01.008.003.16e): Fire suppression storage equals the amount of water needed to support fire flow in those systems that provide it.

  As described in Chapter 5, the storage volume required for fire protection was estimated from the fire flow recommendations established by the Idaho Survey and Ratings Bureau (ISRB). Table 5-6 shows some of these largest fire flows. It is noted in Table 5-6 that some of the identified fire demands are not currently in operation (i.e., Idahoan Foods), however, the City has indicated they have favorable infrastructure (e.g., rail) to be well positioned to have these locations re-establish commercial and industrial operations. With guidance from the City, three different fire flows would be used in evaluating the City's storage reservoir in order to give the City several options to consider when planning for the future.

  The first option involved calculating the fire suppression volume required by using the 2 hour, 2,000 gpm fire flow recommended for Worldwide Equine, Inc. This resulted in a required fire suppression volume of 240,000 gallons.

  The next option considered was based on the Carmela Winery ISRB fire flow of 3,000 gpm for 3 hours. This option resulted in a fire suppression storage volume of 540,000 gallons.

  The final option considered with regard to the evaluation of the fire suppression storage assumed that the currently unused Idahoan potato processing plant is reopened for some sort of industrial use. Using the ISRB fire flow for this facility (5,500 gpm for 4 hours) resulted in a total fire suppression volume of 1,320,000 gallons.

  All of these three fire flow options would also address the routine residential fire flow storage of 1,000 gpm for 2 hours (120,000 gallons)

- Emergency (standby) Storage (IDAPA 58.01.008.003.16f): Standby storage provides a measure of reliability or safety factor should sources fail, or when unusual conditions impose higher than anticipated demands. Normally used for emergency operation, if standby power is not provided, to provide water for eight hours of operation at average day demand.

Table 6-3, Table 6-4, and Table 6-5 below provide a summary of the volume allotment assigned to each type of storage for the existing and future system for each of the fire flow options discussed above.

TABLE 6-3. WATER STORAGE ALLOTMENTS (2,000 GPM FIRE FLOW 2 HOURS)

Storage Type	2014 Reservoir Gallons	2034 Reservoir Gallons
Total Available Storage	500,000	500,000
Operational Storage	35,742	35,742
Equalization Storage	2,720	4,041
Fire Suppression Storage	240,000	240,000
Emergency Storage[1]	103,597	153,939
Total Required Storage	**382,059**	**433,722**
Additional Storage Volume Required	**0**	**0**

1. According to IDAPA standards, emergency storage can be reduced or eliminated if back-up power is provided for the system.

TABLE 6-4. WATER STORAGE ALLOTMENTS (3,000 GPM FIRE FLOW 3 HOURS)

Storage Type	2014 Reservoir Gallons	2034 Reservoir Gallons
Total Available Storage	500,000	500,000
Operational Storage	35,742	35,742
Equalization Storage	2,720	4,041
Fire Suppression Storage	540,000	540,000
Emergency Storage[1]	103,597	153,939
Total Required Storage	**682,059**	**733,722**
Additional Storage Volume Required	**182,059**	**233,722**

1. According to IDAPA standards, emergency storage can be reduced or eliminated if back-up power is provided for the system.

TABLE 6-5. WATER STORAGE ALLOTMENTS (5,500 GPM FIRE FLOW 4 HOURS)

Storage Type	2014 Reservoir Gallons	2034 Reservoir Gallons
Total Available Storage	500,000	500,000
Operational Storage	35,742	35,742
Equalization Storage	2,720	4,041
Fire Suppression Storage	1,320,000	1,320,000
Emergency Storage[1]	103,597	153,939
Total Required Storage	**1,462,059**	**1,513,722**
Additional Storage Volume Required	**962,059**	**1,013,722**

1. According to IDAPA standards, emergency storage can be reduced or eliminated if back-up power is provided for the system.

6.3 BACK-UP POWER SUPPLY

The City currently has no back-up power generators for its water system. Idaho DEQ issued a drinking water rule interpretation for standby power in 2006. The rule "requires standby power sufficient to maintain distribution pressure standards and supply flow equal to average day demand for a period of eight hours, including fire flow where provided. If a system has elevated storage sufficient to meet this criterion, no standby power would be required." The City currently does not meet the intent of this rule when looking at storage options 2 and 3 above, because they do not have a sufficient volume available in the storage reservoir for emergency storage.

6.4 WATER TREATMENT

The City's microfiltration water treatment plant was constructed in 2004, and is discussed in detail in Chapter 3.

6.4.1 Facility Capacity

Because the water system consists of a water storage reservoir, the treatment plant is required to meet only the maximum day demand consistently over the 20-year planning period.

Based on the flow projections presented previously, the City's average day demand is expected to increase from 216 gpm in 2014 to 321 gpm in 2034, and its maximum day demand is expected to increase from 453 gpm to 673 gpm in 2034. The current rated capacity of the facility is about 750 gpm, and should therefore be able to provide adequate capacity through the 20-year planning period. No specific improvements targeted to achieve the design capacity are expected.

6.4.2 Water Quality and Regulatory Considerations

No specific regulatory improvements are anticipated that cannot be accommodated by the current facility. Chemical flocculation followed by membrane ultrafiltration will likely be capable to consistently meet anticipated future regulatory criteria.

Specific aspects of the existing facility will be discussed briefly in the following sections.

6.4.2.1 Surface Water Screening

During a review of the surface water intake facility, the operators noted that the inlet and outlet solenoid control valve used to flush the 800 micron basket style strainer periodically plugs with material, reducing the flush efficiency and eventually causing the entire screen to blind.

6.4.2.2 PAC Feed System

The only area in which water quality has historically come close to exceeding the MCL, was for disinfection byproducts including TTHM and HAA5s, as discussed in Chapter 3. As these water quality issues continue to arise, the system has the capability of utilizing its influent powder activated carbon (PAC) feed system to absorb and remove organics from the plant influent. These organics are likely the cause of the disinfection byproducts as they are oxidized by sodium

hypochlorite used for disinfection. Currently, the PAC system has not been utilized as it has not been needed to meet finished water quality requirements.

6.4.2.3 Ferric Chloride Feed System

As with most ferric feed systems, evidence of ancillary corrosion and cosmetic staining caused by the chemical is prevalent throughout the plant. Cosmetic staining is not a significant issue, however, corrosion of adjacent equipment, door handles, and mixing equipment has had deleterious effects in some cases.

Similar to corrosion effects, plugging of the coagulant feed lines at the injectors has been a problem in the past. The operators have devised a routine system for removing the injector and swabbing the pipe interior with a short dowel to remove accumulated coagulant material.

6.4.2.4 Flocculation Tanks

Discussion with the plant operators indicate that the flocculation tanks are prone to buildup of mussels ranging in size from less than 1mm to over 20mm diameter. These mussels are an invasive species that have spread throughout the Snake River basin and flourish in waters with hardness greater than 20 mg/L as $CaCO_3$. The mussels cannot grow in water with low hardness (less than 20 mg/L) as they rely on the calcium in the water to help generate shell tissue. The operators have not had a sample analyzed, but believe the muscles to be Zebra Mussels. The presence of these in the facility is alarming as they often grow unchecked in similar facilities throughout the Southwest U.S. and Missouri/Mississippi River basins. As the mussels grow, they leave shell remnants behind to build up within pipelines. These shells can plug and block pipelines, intakes, and even pumps, and are extremely difficult to remove.

The mussels have yet to be spotted downstream of the flocculation tanks, and have not yet caused a noticeable decrease in efficiency of any part of the plant.

6.4.2.5 Filtration

TMP has increased (become more negative) over the past 7 years at a rate of 0.07 psi per year. Expected typical membrane life based on manufacturer information can vary from 7 to 12 years. The Glenns Ferry system currently does minimal chemical cleaning compared to newer technology facilities. The chemicals used for cleaning help remove fouling from the membranes, but also reduce the life expectancy of the fibers as they oxidize the membrane material. Based on the TMP data reviewed, assuming the same trend on TMP, at 12 years the TMP would have reduced to only -4.46 psi. As this is still within the expected range for the ZeeWeed 500C fiber, this review suggests there is a possibility that the membrane fibers would last for another 5 years.

6.4.2.6 Chlorine Contact Chamber

The outlet of the chlorine contact chamber is currently a fixed weir to maintain a constant water volume. Through discussion with the water treatment plant operators, it was indicated that this weir should be converted to a downward opening weir gate to allow a portion of the upper half of the tank volume to flow to the finished water pump station in the event of a disruption to the plant filtration production. The basin is not partitioned and must be completely taken off-line for maintenance.

6.5 DISTRIBUTION PUMP STATION

The distribution system pump station includes two vertical turbine pumps (one duty, one standby) with variable frequency drives, each rated at 750 gpm, as described in Chapter 3. The SCADA system controls the operation of the distribution pumps based on water levels in the finished water clearwell and the storage tank.

The pumps were installed in 2004 and are located inside the water treatment plant building. The distribution pumps appear to be operating satisfactorily and no upgrades are planned or anticipated for the foreseeable future.

6.6 HYDRAULIC MODEL OVERVIEW/DISTRIBUTION SYSTEM ANALYSIS

6.6.1 Hydraulic Model Overview

A computer model was developed to evaluate the hydraulic performance of the City's existing water system for the current and projected 40-year planning populations. Results of the model assisted in determining the necessary upgrades to the water system to meet the immediate and future needs of the City.

6.6.1.1 Terms and Abbreviations

For the City to effectively use this report as a guide for the future development of their water system, several terms and abbreviations should be defined.

Average Day Demand – Demand that would exist if the total water use for one year was applied at a uniform rate throughout the year.

Maximum Day Demand – Demand that would exist if the most water used in any one day was applied at a uniform 24-hour rate.

Peak Hour Demand – Highest demand that occurs at any time throughout the year.

mgd – Million gallons per day.

gpm – Gallons per minute.

gpd – Gallons per day.

gpcd – Gallons per capita per day (gallons per day per person).

psi – pounds per square inch.

6.6.1.2 Design Criteria

The design criteria used to analyze the water system in this study are as follows:

- All pressures during average day, maximum day, or peak hour demand should be greater than 40 psi and less than 100 psi (IDAPA 58.01.08 Part 552)

- All velocities in the water distribution mains during normal operation (no fire flows) should be less than 5.0 fps (good design standard).

- All head losses in the water mains during normal operation should be less than 2.6 psi per 1,000 feet of pipe (good design practice).

- All pressures in the water distribution mains during a fire flow should be greater than 20 psi (IDAPA 58.01.08 Part 552).

Finally, when working with population densities, 2.4 people per household was used for existing residences. This value is representative of the population from the census data and the number of connections.

6.6.1.3 Description of Existing Water System Model

The hydraulic model used to analyze the City's water system was InfoWater, a software package produced by Innovyze. The model is a graphical interface water modeling system that enables the user to input water system data into a database, and combine the data with GIS maps of a community to produce a functioning water model.

Figure 6-2 shows the existing distribution piping, nodes, tank, and pump, with junction names labeled. Figure 6-3 shows the same facilities, except with pipe names labeled. The tank is filled by the distribution system and finished water pumps at the water treatment plant, while gravity controls water coming from the tank back into the distribution system. The water supply is modeled by a reservoir located at the Snake River, since both sources are combined before being treated and boosted into distribution.

A count of all houses, businesses and miscellaneous other water users were compiled from aerial verification. Water meter readings were analyzed and water demand was distributed proportionally to each junction node based on the house count in that area. Water treatment plant production and pumping data was used to estimate flows and peaking factors for maximum day and peak hour flow demands applied to the nodes in the model.

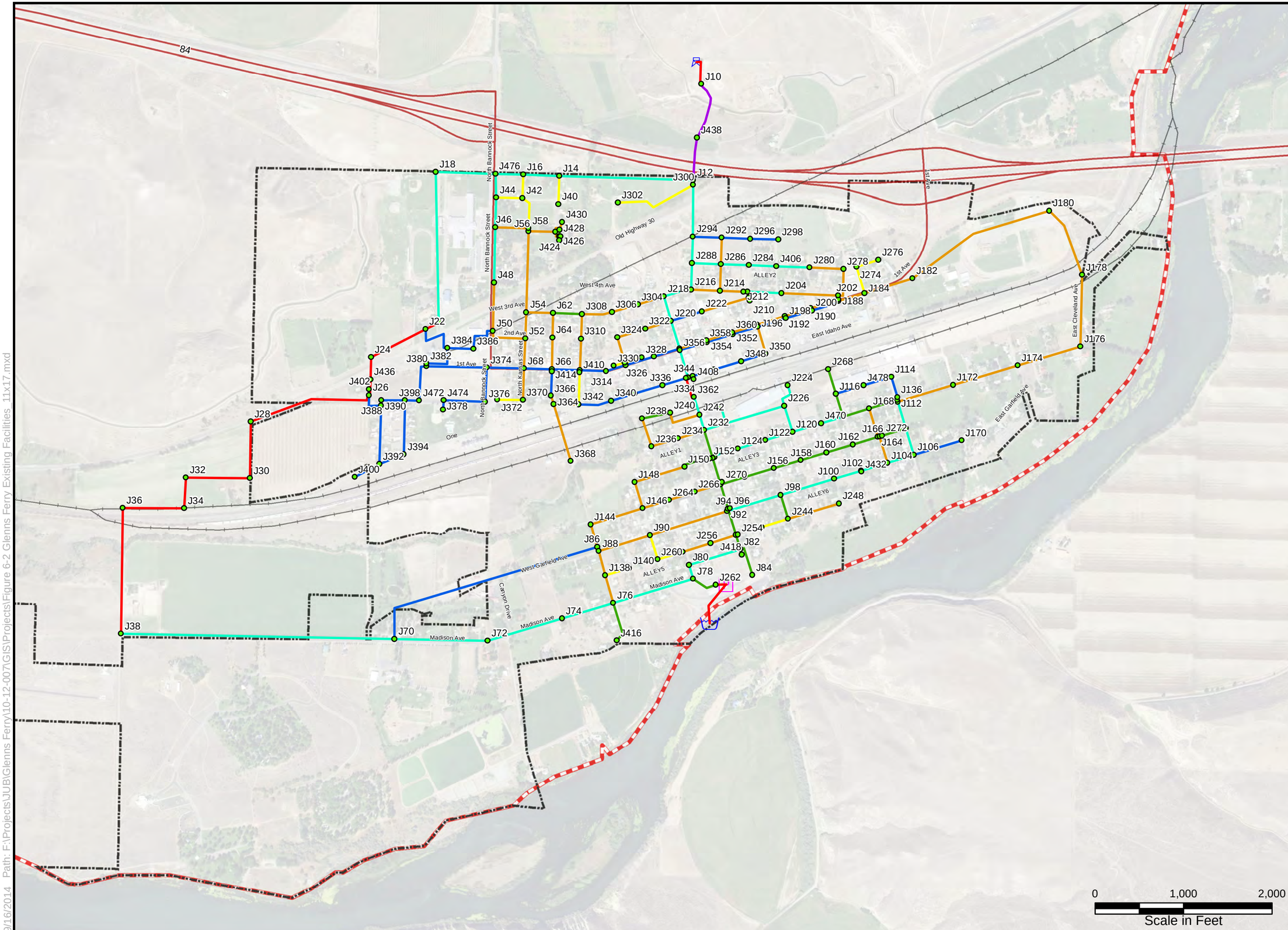
As previously discussed, the existing average day flow was determined from water records as approximately 216 gpm (310,790 gpd). The maximum day flow was determined earlier with a peaking factor of 2.1, which resulted in a maximum day demand of 453 gpm (652,659 gpd). The third hydraulic factor used in analysis of the water system was the peak hour factor. The peak hour flow was established earlier with a peaking factor of 4.2 times the average day demand. This resulted in a peak hourly flow of approximately 906 gpm (1,305,319 gpd).

To better simulate the conditions of the existing water system, the storage tank was incorporated into the model. During peak flow periods, the tank will supply the system with water, and will fill during periods of lower water demand.

FIGURE 6-2

CITY OF GLENNS FERRY EXISTING WATER SYSTEM (JUNCTIONS LABELED)

WATER SYSTEM FACILITIES PLAN



Legend

Junctions

Pipes

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

Tank

Water Supply

Pump

- City Limits
- Planning Area

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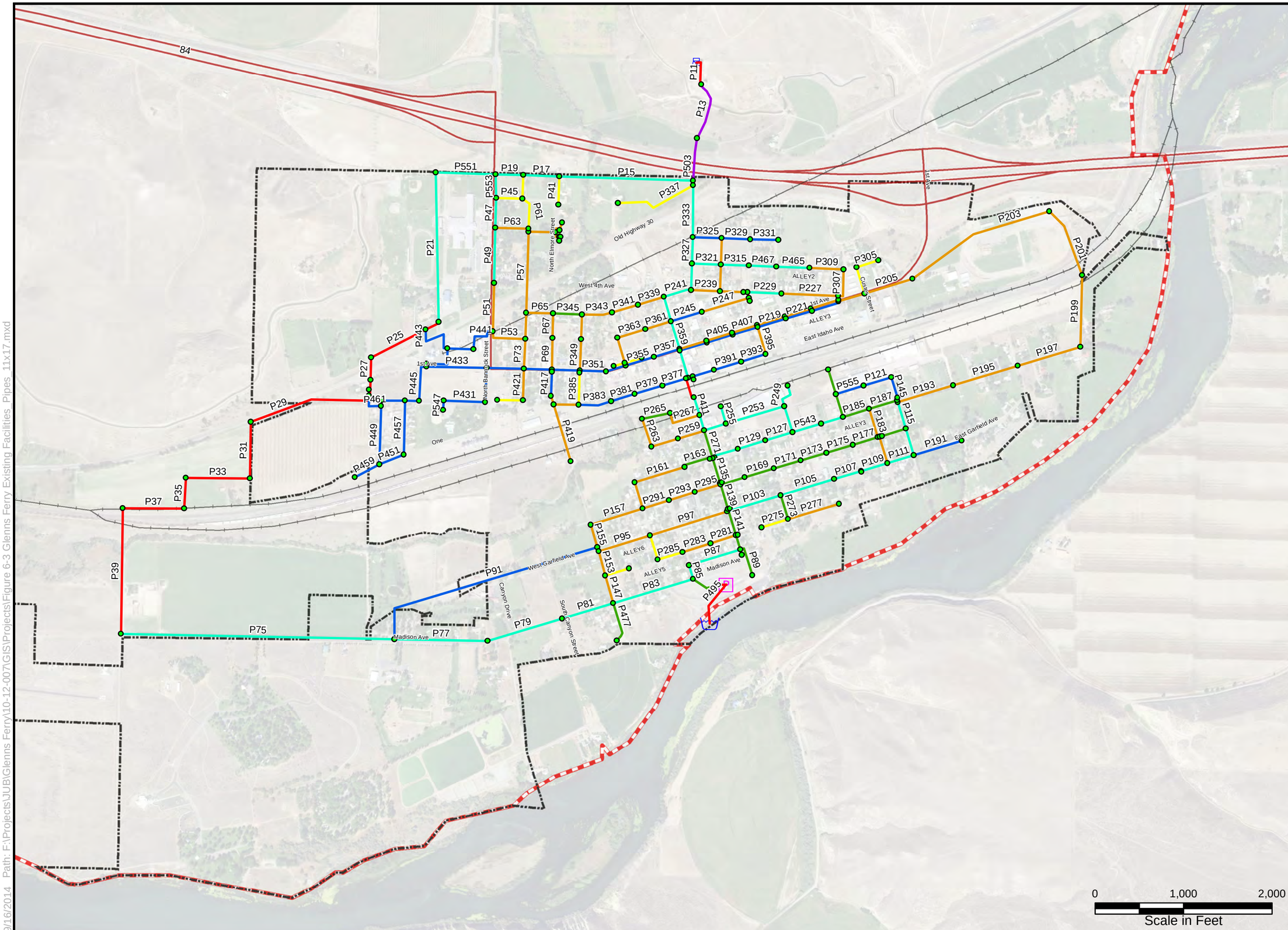
9/16/2014 Path: F:\Projects\JUB\Glenns Ferry\10-12-007\GIS\Projects\Figure 6-2 Glenns Ferry Existing Facilities_11x17.mxd

FIGURE 6-3

CITY OF GLENNS FERRY EXISTING WATER SYSTEM (PIPES LABELED)

WATER SYSTEM FACILITIES PLAN



Legend

Junctions

Pipe

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

Tank

Water Supply

Pump

City Limits

Planning Area

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9/16/2014 Path: F:\Projects\JUB\Glenns Ferry\10-12-007\GIS\Projects\Figure 6-3 Glenns Ferry Existing Facilities_Pipes_11x17.mxd

6.6.1.4 Model Calibration

To calibrate the model, water demand data provided by the City for the year 2013 was loaded into the model, and resulting pressures in the model were compared to fire hydrant tests that were performed that same year.

It should be noted that some variation between actual and predicted values occurred because of the inability to control all system parameters in actual field tests, and the inability to accurately read the pressure gauges due to their range of values. Therefore, the pressure and flow values did not correspond exactly, but were reasonably accurate.

Once the model was calibrated, it was used to analyze the existing system to determine potential problem areas within the community. The model was then used to analyze the water system based on future growth projections. Of particular interest were areas in which the water system will need to be upgraded to handle the increasing demands of growth.

6.6.1.5 Description of Future Model

Based on the 2% growth rate being used for this evaluation, it was determined that by the year 2054 there would be approximately 1,391 connections to the water system and 1,652 EDUs. This projection results in 761 more connections than the existing system and 904 additional EDUs. In order to create the future system model, these new connections and their associated demands were incorporated into the existing system model in areas where City personnel stated that they expect to see growth occur. These areas included vacant areas within the City limits, as well as currently rural and agricultural areas to the west of the existing City limits which are zoned for future suburban development.

As determined in Chapter 5, the future maximum day demand at the end of the 40-year planning period was calculated to be about 1,001 gpm, with an associated peak hour demand of approximately 2,002 gpm. These demands were allocated to the system model junctions based on proximity of expected water connections.

6.7 DISTRIBUTION SYSTEM EVALUATION AND MODEL RESULTS

6.7.1 Distribution System Age and Condition

As discussed in Chapter 3, much of Glenns Ferry's combined drinking water/fire suppression distribution system is older than 50 years, and has exceeded its design life. Table 6-6 below shows a summary of the distribution pipes throughout the system.

In 2007, the City commissioned a water project to replace some badly deteriorated water lines, add a west end loop, and bore under the railroad tracks in the center of town. The west end loop provides a second trunk line under the railroad tracks that bisects the city simultaneously providing some redundancy for emergency water supply. Wherever the water lines were replaced, new hydrants were installed and separation requirements from non-potable water lines were strictly adhered to.

TABLE 6-6. SUMMARY OF WATER DISTRIBUTION PIPE

Pipe Diameter (inches)	Material	Length (feet)	Estimated Age (years)	Condition	Recommended Action
2	Galvanized	644	50+	Unknown	Replace
2	PVC	1911	<10	New/Good	None
2	Steel	2381	50+	Unknown	Replace
4	CIP	4061	50+	Unknown	Replace
4	PVC	679	<10	New/Good	None
4	Steel	24163	50+	Unknown	Replace
6	CIP	3912	50+	Unknown	Replace
6	PVC	12962	<10	New/Good	None
6	Steel	4450	50+	Unknown	Replace
8	CIP	120	50+	Unknown	Replace
8	PVC	4241	<10	New/Good	None
8	Steel	3146	50+	Unknown	Replace
10	PVC	19163	<10	New/Good	None
10	Steel	4640	50+	Rusty/Poor	Replace
12	D.I.	890	<10	New/Good	None
12	PVC	6025	<10	New/Good	None
14	HDPE	1149	<10	New/Good	None

During the 2007 water project, several replacement water distribution lines were designed to connect with the main water trunk line in Commercial Street. The main trunk line was deteriorated such that it was not deemed reasonable to directly connect the new water mains. This water line needs to be removed and replaced to protect citizens in the event of fire and to improve system reliability.

Immediately following the 2007 project, the water line in Commercial Street was scheduled for replacement and engineered drawings were produced. Unfortunately, funding was not available at that time. The project remains "shovel ready" while the existing pipe continues to deteriorate.

In addition to the age of the system, much of the existing pipe is 4 inch diameter. 6 inch diameter pipe is now the minimum allowable size for systems that provide fire flow. It is recommended that 8 inch diameter pipe be the standard minimum pipe size in the City in order to allow for increased safety as well as to accommodate growth and improve overall system flow. It is also recommended that the City create loops wherever possible and practicable within the system in order improve system pressure during high demand and fire flow situations. Specific pipe sizes and locations are predicted with help from the computerized water model.

Fire hydrants should be replaced at the same time as water lines because the majority of the existing fire hydrants are obsolete and do not have a "steamer port", which allows direct connection to fire trucks.

6.7.2 Airport Piping

City personnel have expressed interest in running a new water line to the airport for everyday water use and fire suppression. This would involve running a new water line south from the existing line in Madison Avenue onto airport property, before turning west and creating a loop by tying back into the existing line in Madison from the west. It was assumed that these lines would need to supply a fire flow of 3000 gallons per minute to the airport facilities.

6.7.3 Model Results

6.7.3.1 Existing System Model

Existing Peak Hour Pressures

Figure 6-4 shows pressures that resulted from running the model under peak hour conditions. No nodes that supply service connections experienced a pressure below 40 psi or above 100 psi, as required by IDAPA 58.01.08 Part 552.

Distribution system pressures at the existing peak hour demand, as computed by the water model, are summarized in a table in Appendix H. Figure 6-2 shows the junction names that match the table in Appendix H.

Existing Peak Hour Velocities

Velocities within the system remained below the 5 feet per second standard listed in Section 6.6.1.2, during both the existing maximum day and the existing peak hour scenarios. The distribution system velocities during peak hour demand are summarized in a table in Appendix H.

Existing Peak Hour Headloss

One pipe within the water system had a head loss of greater than 2.6 psi/1000 feet of pipe, which is against the good design practice listed in Section 6.6.1.2. Table 6-7 identifies the pipe and its associated head loss. Figure 6-5 shows this pipe in red. The distribution system head losses are presented in a table in Appendix H.

TABLE 6-7. HIGH EXISTING SYSTEM HEADLOSS

Pipe Name	Pipe Material	Pipe Size (inches)	Headloss/1000 ft (ft)	Headloss/1000 ft (psi)
P289	Steel	8	15.3	6.61

Fire Flow Results

Fire flow was analyzed at 1,000 gpm at all nodes in the system (separately), and at the locations identified in Chapter 5 by the ISRB. All of these model runs were done to target residual pressures greater than 20 psi. Table 6-8 shows the recommended ISRB fire flows and the fire flow that resulted from running the model with a residual pressure of 20 psi. The locations of the highest of these flows is shown in Figure 5-4.

TABLE 6-8. ISRB FIRE FLOW ANALYSIS

Location	ISRB Recommended Fire Flow (gpm)	Fire Flow Available at 20 psi (gpm)	Meet Recommended Fire Flow?
Idahoan Foods Inc.	5,500	2,639	NO
Carmela Winery (NJOY LLC)	3,000	3,864	YES
Worldwide Equine, Inc.	2,000	1,287	NO
City of Glenns Ferry	2,000	876	NO
Glenns Ferry Veterans Hall	1,750	4,090	YES
Glenns Ferry School (School District No. 192)	1,500	3,250	YES
Three Island Senior Citizen Center	1,500	4,098	YES
Stew's Place (Tracy Stewart)	1,250	4,165	YES
Hanson's Café	1,250	2,482	YES

Table 6-9 lists all other junctions that are on lines that currently supply fire hydrants that were not able to meet the 1,000 gpm fire flow while maintaining the required 20 psi residual pressure. Figure 6-6 shows these junctions in red.

As can be seen in Figure 5-4 and Table 6-9, the majority of the junctions that do not meet the fire flow requirements are located on existing 2 inch or 4 inch lines.

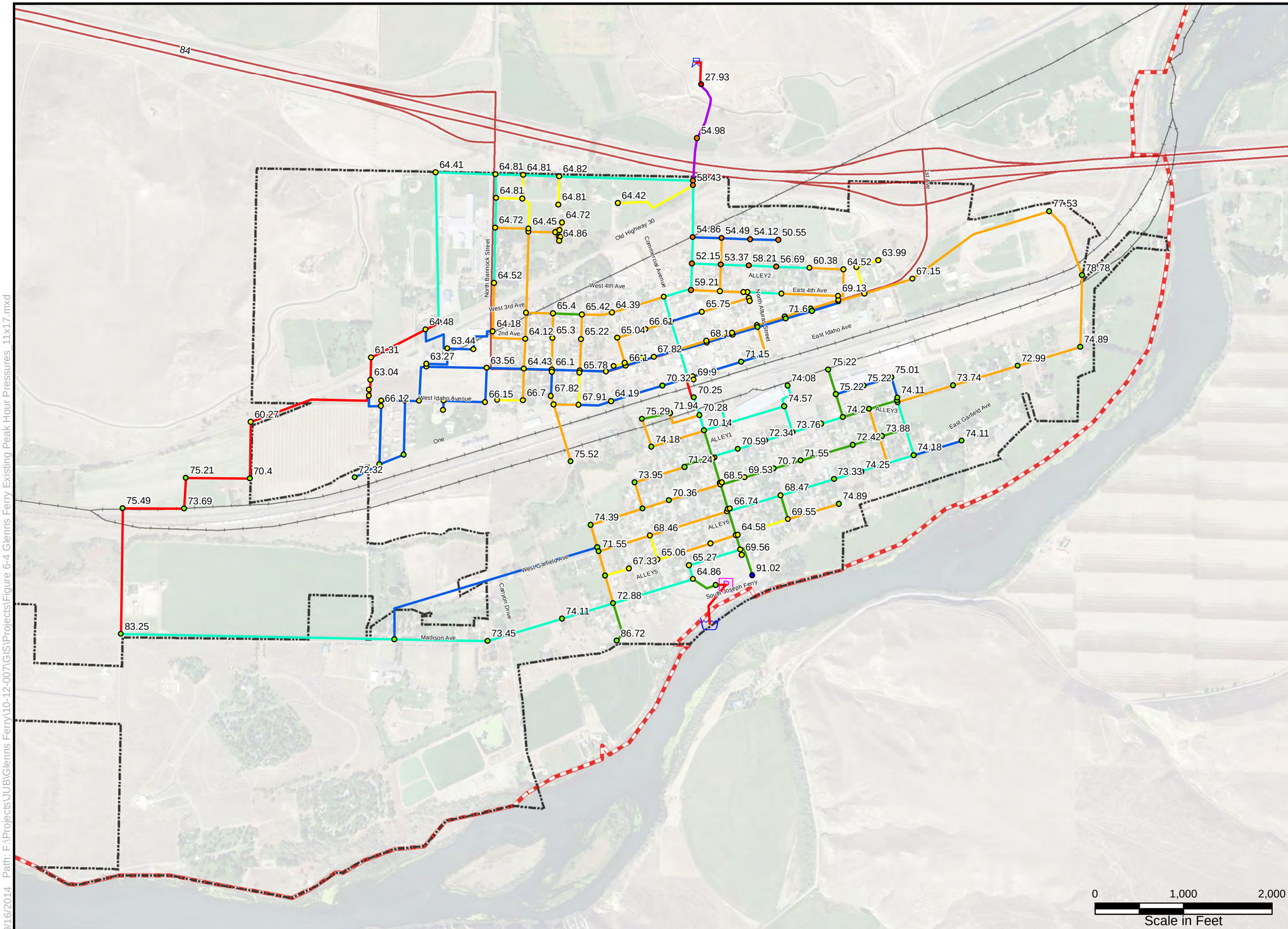
TABLE 6-9. FIRE FLOW DEFICIENCIES

Junction ID	Available Flow at 20 psi	Pipe Size (inch)	Pipe Material
J302	63.41	2	PVC
J372	99.09	2	Steel
J260	195.67	2	Steel
J42	315.31	2	Steel
J178	382.5	4	Steel
J180	385.57	4	Steel
J176	387.62	4	Steel
J174	426.51	4	Steel
J420	434.84	4	Cast Iron
J182	462.25	4	Steel
J258	466.41	4	Steel
J368	487.2	4	PVC
J370	542.01	4	Steel
J172	561.75	4	Steel
J256	653.77	4	Steel
J56	668.33	4	Cast Iron
J184	698.42	4	Steel
J44	716.52	2	Steel
J48	721.57	4	Steel
J90	808.41	4	Steel
J236	834.37	4	Steel
J240	863.01	4	Steel
J264	875.36	4	Steel
J378	881.95	6	Cast Iron
J306	884.31	4	Steel
J238	889.55	4	Steel
J148	905.25	4	Steel
J234	935.05	4	Steel
J324	939.18	4	Steel
J298	950.97	6	PVC
J304	954.45	4	Steel
J266	960.49	4	Steel
J322	983.8	4	Steel
J144	987.26	4	Steel
J278	995.77	4	Steel

FIGURE 6-4

CITY OF GLENNS FERRY EXISTING PEAK HOUR PRESSURES

WATER SYSTEM FACILITIES PLAN



Legend

Pressure

- less than 40.00
- 40.00 ~ 60.00
- 60.00 ~ 70.00
- 70.00 ~ 90.00
- 90.00 ~ 100.00
- greater than 100.00

Pipe

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

Tank

Water Supply

Pump

- City Limits
- Planning Area

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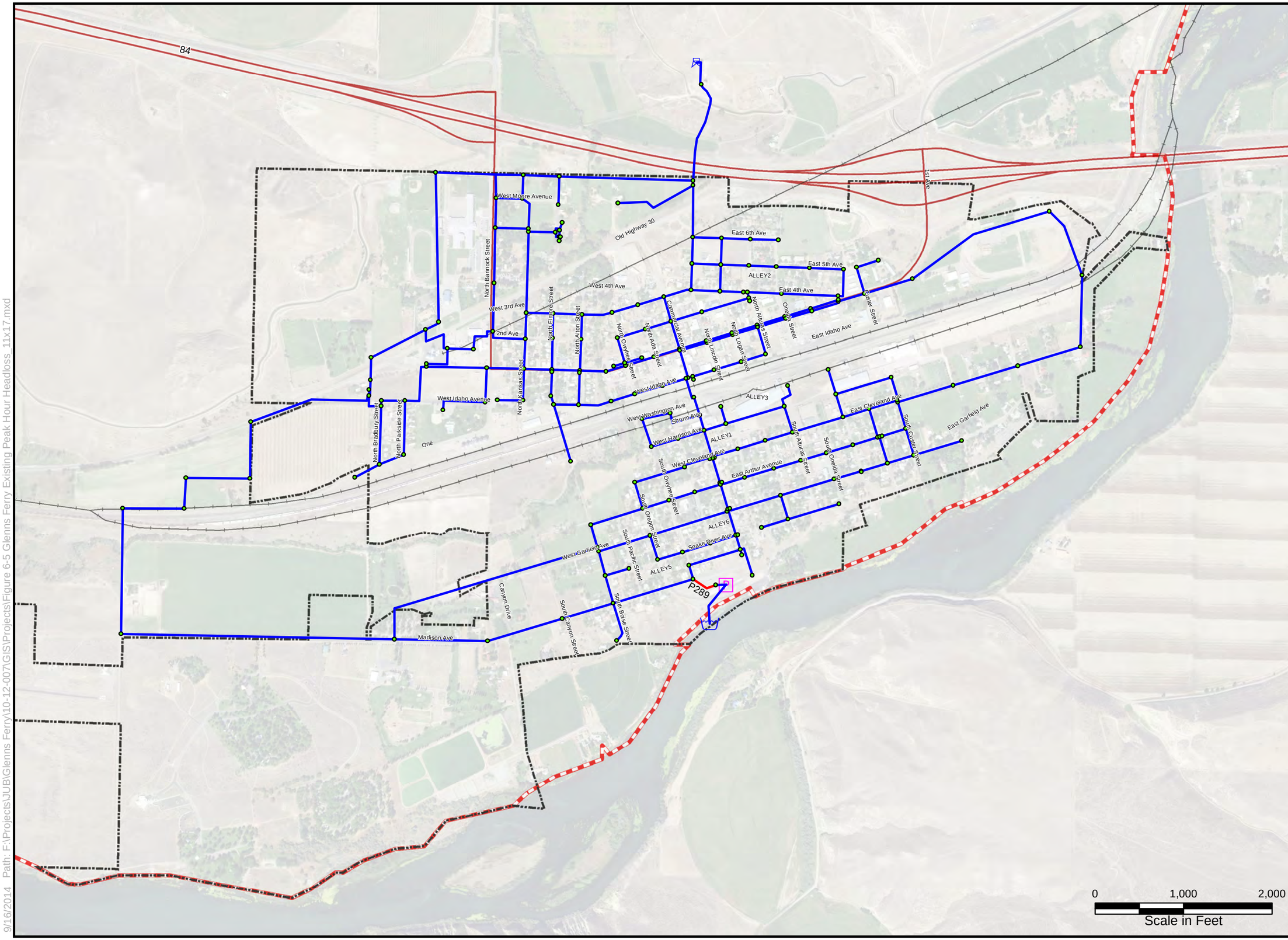
9/16/2014 Path: F:\Projects\JUB\Glenns Ferry\10-12-007\GIS\Projects\Figure 6-4 Glenns Ferry Existing Peak Hour Pressures_11x17.mxd

FIGURE 6-5

CITY OF GLENNS FERRY EXISTING WATER SYSTEM PEAK HOUR HEAD LOSS

WATER SYSTEM FACILITIES PLAN



Legend

Pipe Head Loss

- Less Than 2.6 psi/1000 ft
- Greater Than 2.6 psi/1000 ft

Tank

Water Supply

Pump

- City Limits
- Planning Area

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Path: F:\Projects\JUB\Glenns Ferry\10-12-007\GIS\Projects\Figure 6-5 Glenns Ferry Existing Peak Hour Headloss_11x17.mxd

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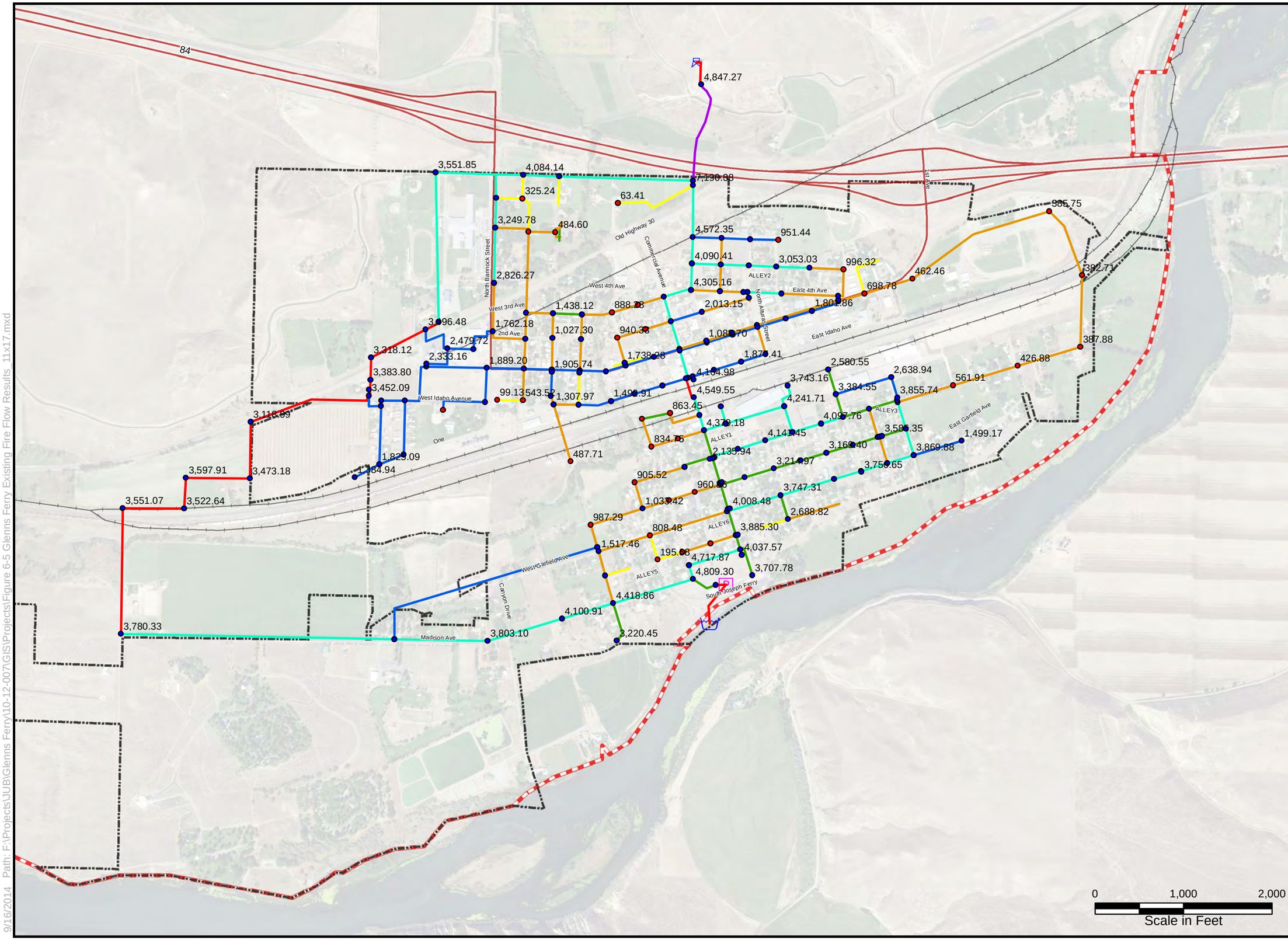
FIGURE 6-6

CITY OF GLENNS FERRY EXISTING FIRE FLOW RESULTS

WATER SYSTEM FACILITIES PLAN



Legend

Available Flow

- Less Than 1,000 gpm
- Greater Than 1,000 gpm

Pipes

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

Tank

Water Supply

Pump

- City Limits
- Planning Area

J-U-B ENGINEERS, INC.

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Path: F:\Projects\JUB\Glenns Ferry\10-12-007\GIS\Projects\Figure 6-5 Glenns Ferry Existing Fire Flow Results_11x17.mxd

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6.7.3.2 Future System Model

Future Peak Hour Pressures

Figure 6-7 shows pressures that resulted from running the future model under peak hour conditions. No nodes that supply service connections experienced a pressure below 40 psi or higher than 100 psi, as required by IDAPA 58.01.08 Part 552.

Distribution system pressures at the future peak hour demand, as computed by the water model, are summarized in a table in Appendix I. Figure 6-2 shows the junction names that match the table in Appendix I.

Future Peak Hour Velocities

One pipe in the distribution system experienced velocities greater than the 5 feet per second standard listed in Section 6.6.1.2 during the future peak hour scenario. This pipe is P289, which experienced a velocity of 6.3 feet per second. P289 is the same pipe that failed to meet the good design practice for head loss in the existing system, and is shown in Table 6-7 and Figure 6-5. All other pipes in the system experienced velocities below the 5 feet per second standard.

The distribution system velocities resulting from the future peak hour scenario are listed in a table in Appendix I.

System Peak Hour Head Losses

Several pipes within the water system had head losses of greater than 2.6 psi/1000 feet of pipe as a result of running the future peak hour model, which is against the good design practice listed in section 6.6.1.2. Table 6-10 identifies these pipes and their associated head loss. Figure 6-8 shows these pipes in red. The distribution system head losses are presented in a table in Appendix I.

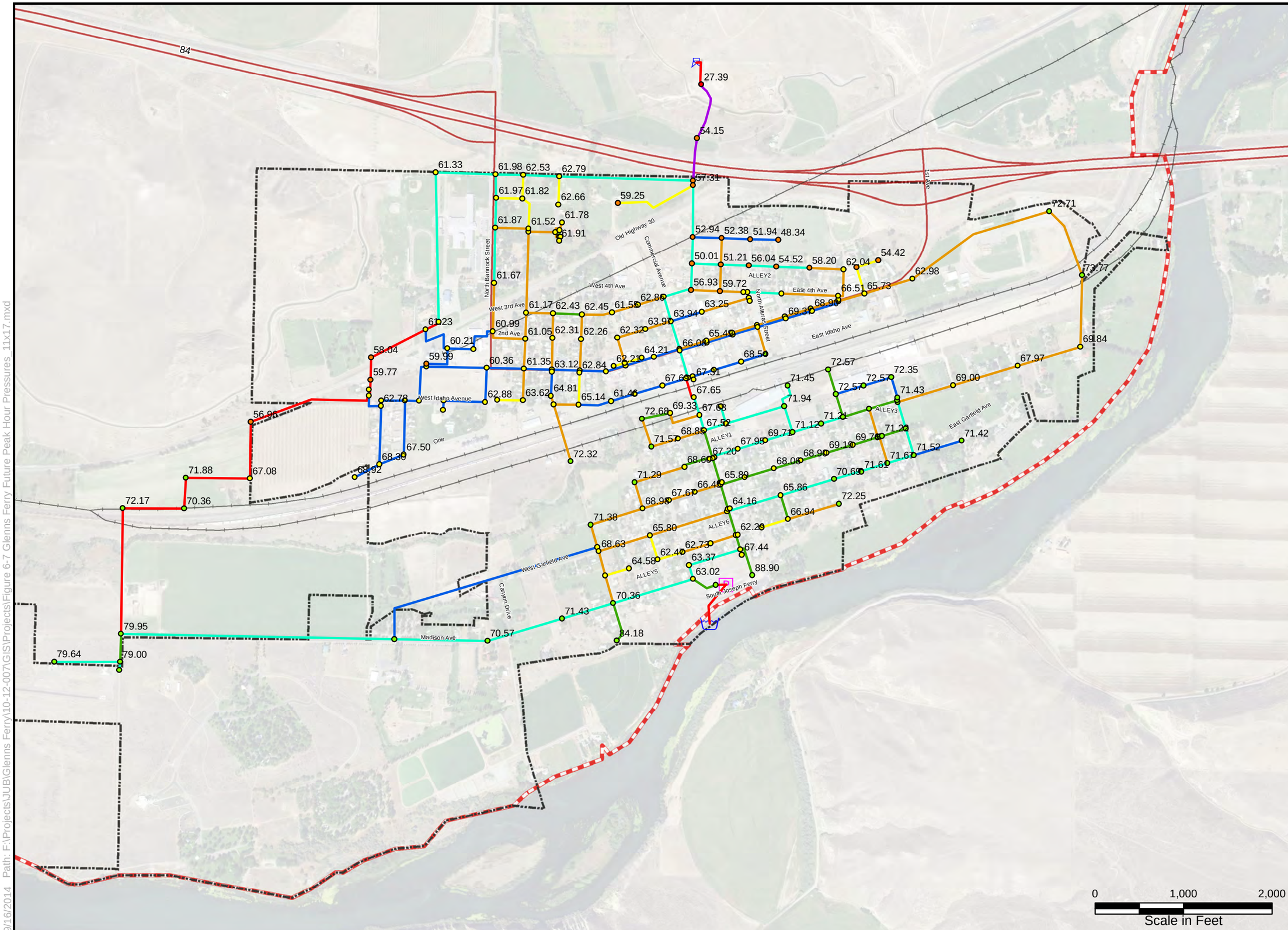
TABLE 6-10. HIGH FUTURE SYSTEM HEADLOSS

Pipe ID	Pipe Material	Pipe Size (inches)	Headloss/1000 ft (ft)	Headloss/1000 ft (psi)
P303	Steel	2	31.83	13.8
P289	Steel	8	29.01	12.6
P305	Steel	2	18.08	7.8
P337	PVC	2	10.2	4.4
P43	PVC	2	9.43	4.1
P193	Steel	4	7.9	3.4
P143	Steel	8	7.3	3.2
P207	Steel	4	7.16	3.1
P141	Steel	8	6.39	2.8

FIGURE 6-7

CITY OF GLENNS FERRY FUTURE PEAK HOUR PRESSURES

WATER SYSTEM FACILITIES PLAN



Legend

Pressure

- less than 40.00
- 40.00 ~ 60.00
- 60.00 ~ 70.00
- 70.00 ~ 90.00
- 90.00 ~ 100.00
- greater than 100.00

Pipes

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

Tank

Water Supply

Pump

- City Limits
- Planning Area

J-U-B ENGINEERS, INC.

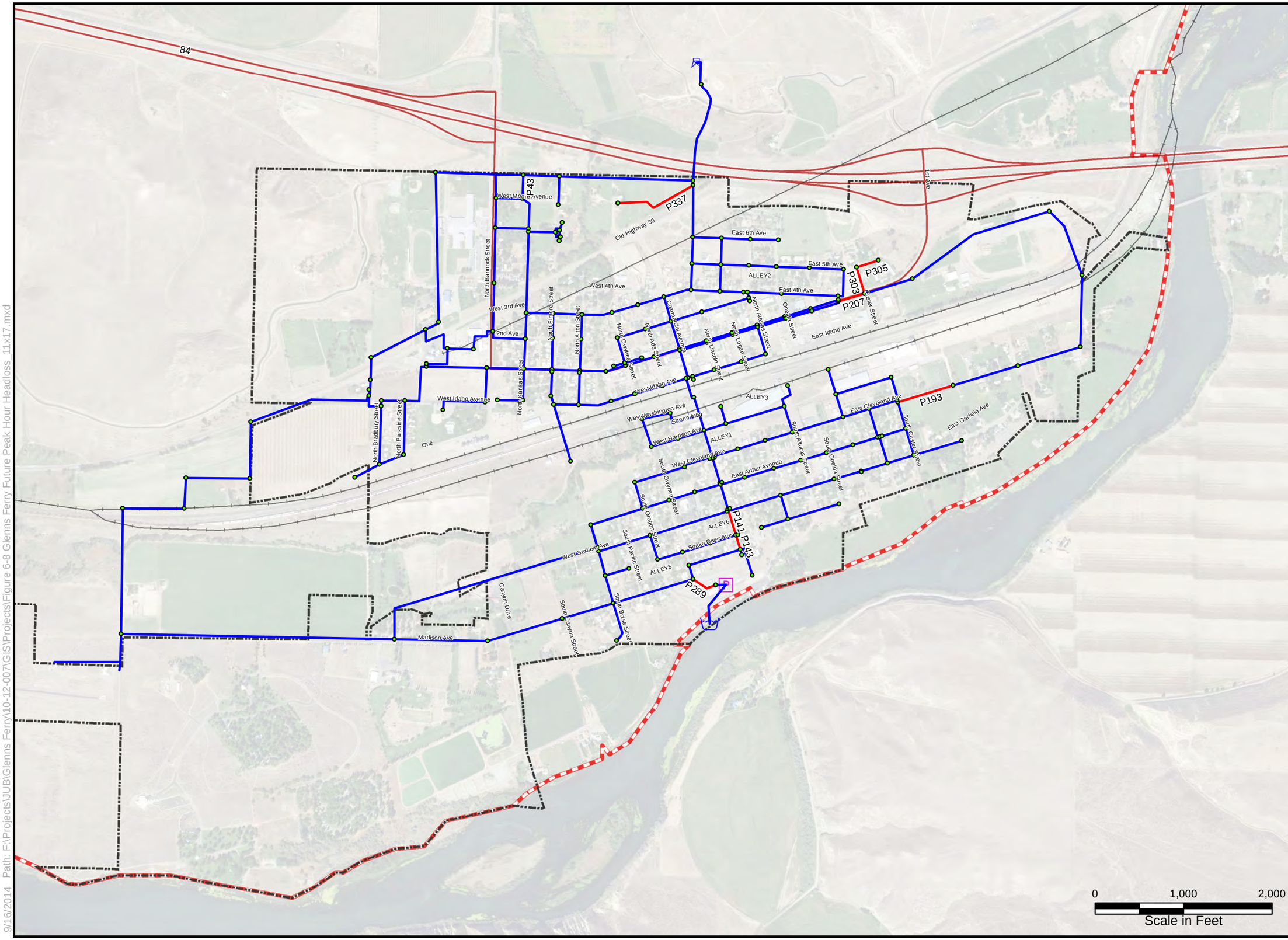
N

9/16/2014 Path: F:\Projects\JUB\Glenns Ferry\10-12-007\GIS\Projects\Figure 6-7 Glenns Ferry Future Peak Hour Pressures_11x17.mxd

FIGURE 6-8

CITY OF GLENNS FERRY FUTURE WATER SYSTEM PEAK HOUR HEADLOSS

WATER SYSTEM FACILITIES PLAN



Legend

Pipe Headloss

- Less Than 2.6 psi/1000 ft
- Greater Than 2.6 psi/1000 ft

Tank

Water Supply

Pump

- City Limits
- Planning Area

J-U-B ENGINEERS, INC.

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9/16/2014 Path: F:\Projects\JUB\Glenns Ferry\10-12-007\GIS\Projects\Figure 6-8 Glenns Ferry Future Peak Hour Headloss_11x17.mxd

6.8 PRESSURE ZONES

The City currently utilizes only one pressure zone for its water system. The pressures throughout the system are maintained through the distribution pumps located at the water treatment plant, and the storage tank located at the north end of town. City personnel report that there are currently no pressure zone problems within the water system.

6.9 CONTROL SYSTEM

According to City personnel, the SCADA system has operated satisfactorily to date with no significant problems. The City is currently working on some programming updates, but they will incorporate these costs into their water system maintenance budget.

Chapter 7

Development and Screening of Improvements

7.0 DEVELOPMENT AND SCREENING OF IMPROVEMENTS

Opinions of probable construction cost have been developed for potential improvements. All costs are in 2014 dollars and cost escalation should be considered for future expenditures. The cost opinions in this report are based on costs typical of the area and typical of the means and methods expected for this kind of construction. The cost opinions are based essentially on summaries of similar projects (i.e., bid tabs) not on detailed take offs from design drawings (which have not yet been developed). The level of cost estimating provided could be considered Class 4 (Study/Feasibility) estimate as defined by the American Association of Cost Engineering (AACE) with an expected range of the final cost to be with -20% to +30% of the estimate. Effort has been made to appropriately estimate the impacts of the conditions known such as local subsurface conditions (such as sand) and general trench depth.

7.1 WATER SUPPLY

7.1.1 "Do-Nothing"

As discussed in Chapter 6, the City has adequate firm supply to meet demands for the next 20 years. The sources are operating satisfactorily and no new sources or upgrades are anticipated for the foreseeable future.

7.2 WATER STORAGE

The evaluation of the City's water storage reservoir was found to hinge primarily on the fire suppression storage that is required. In Chapter 6, three different fire flows were used in evaluating fire suppression storage in order to give the City several options with regard to water storage improvements. The options that resulted are described below.

7.2.1 "Do-Nothing" (Storage Option 1)

7.2.1.1 Description of Option

The first fire flow scenario discussed in the Chapter 6, which used a 2,000 gpm fire flow for a duration of 2 hours, resulted in a required fire suppression storage of 240,000 gallons as shown in Table 6-3. Based on this evaluation, the existing 500,000 gallon storage reservoir is sufficient to meet the City's requirements both now and at the end of the 20-year planning period.

7.2.1.2 Opinion of Probable Cost

Because no additional storage is required for this option, there are no costs involved.

7.2.2 Storage Option 2

7.2.2.1 Description of Option

Using the 3 hour duration fire flow of 3,000 gpm at the Carmela Winery (or other equivalent industrial facility with a similar fire flow) resulted in a required fire suppression storage of 540,000 gallons. Based on this fire suppression storage volume, the City is deficient for storage now and throughout the 20-year planning period, as shown in Table 6-4. For this option, it is

recommended that the City construct a new 250,000 gallon storage reservoir to supplement its existing 500,000 gallon tank.

7.2.2.2 Opinion of Probable Cost

Table 7-1 below presents an opinion of probable cost for the new 250,000 gallon storage reservoir.

TABLE 7-1. OPINION OF PROBABLE COST - STORAGE OPTION 2

Item	Quantity	Units	Unit Price	Total Costs
Build new steel storage tank	250,000	gallons	$1.10	$275,000
			Sub-Total Construction Costs	**$275,000**
			Contractor Mob/Demob (5%)	$13,750
			Buy American Provisions (5%)	$13,750
			Davis-Bacon Wages (5%)	$13,750
			Contingencies (20%)	$55,000
			Total Construction Costs	**$371,250**
			Engineering & Const. Mngt. (17.5%)	$64,969
			Funding, Legal, Admin, Bonding (10%)	$37,125
			Total Project Capital Costs	**$473,344**

7.2.3 Storage Option 3

7.2.3.1 Description of Option

The third option considered is based on the 5,500 gpm fire flow required over a duration of 4 hours for the currently unused Idahoan Foods processing plant (or other similar industrial demand). This option was considered in the hopes that a new company may purchase and restart operations at the existing facility in the near future. As seen in Table 6-5, this option resulted in an additional 1,013,722 gallons of required storage on top of the existing 500,000 gallon tank. Under this scenario, it is recommended that the City construct a new 1 million gallon concrete reservoir.

7.2.3.2 Opinion of Probable Cost

An opinion of the probable cost associated with a new 1 million gallon tank is shown in Table 7-2 below.

TABLE 7-2. OPINION OF PROBABLE COST - STORAGE OPTION 3

Item	Quantity	Units	Unit Price	Total Costs
Build new concrete storage tank	1,000,000	gallons	$1.00	$1,000,000
			Sub-Total Construction Costs	**$1,000,000**
			Contractor Mob/Demob (5%)	$50,000
			Buy American Provisions (5%)	$50,000
			Davis-Bacon Wages (5%)	$50,000
			Contingencies (20%)	$200,000
			Total Construction Costs	**$1,350,000**
			Engineering & Const. Mngt. (17.5%)	$236,250
			Funding, Legal, Admin, Bonding (10%)	$135,000
			Total Project Capital Costs	**$1,721,250**

7.3 BACK-UP POWER SUPPLY

7.3.1 "Do-Nothing"

The City currently does not have back-up power generators for its system. In the event of a prolonged power outage, the water treatment plant would not be able to supply finished water to the distribution system, leaving the storage tank to meet all demands.

7.3.2 Back-Up Power System Improvements

7.3.2.1 Description of Option

It is recommended that the City purchase and install back-up power generators to allow the raw water intake facilities and the water treatment plant to operate during a power outage. Two separate back-up power generators would be required for the system in order to allow for continued water production.

The first generator would be located near the Snake River and the infiltration gallery intake facilities. This generator would allow the intake facilities to pump raw water from the sources to the treatment plant building. The second generator would be located at the water treatment plant itself. This generator would allow treatment operations and distribution pumps to continue to operate during a power outage. The load that each generator would be required to supply are summarized in Table 7-3 and Table 7-4, respectively.

Another benefit of incorporating back-up power for the system, is that IDAPA regulations allow emergency storage to be reduced or eliminated, which could reduce the size of the proposed storage reservoir.

TABLE 7-3. INTAKE FACILITIES BACK-UP GENERATOR LOAD

Item	Quantity	Unit hp	hp	kW
Snake River Intake Pump	1	20	20	15.0
Infiltration Gallery Pump	1	20	20	15.0
Air Burst (air scour system)	1	15	15	11.3
Amiad Filter	1	1	1	0.8
Traveling Screen	1	1	1	0.8
Valve Operators	2	1	2	1.5
HVAC Units	2	10	20	15.0
Total Load			**79**	**59**

TABLE 7-4. TREATMENT PLANT BACK-UP GENERATOR LOAD

Item	Quantity	Unit hp	hp	kW
Distribution Pumps	1	60	60	45.0
Permeate and Backpulse Pumps	2	7.5	15	11.3
PAC Mixer	1	5	5	3.8
Flocculator	2	1	2	1.5
Process Exhaust	1	3	3	2.3
Flash Mixer	1	1	1	0.8
Vacuum Pumps	2	3	6	4.5
CIP Pump	1	5	5	3.8
Blowers	1	20	20	15.0
Air Compressors	2	20	40	30.0
Water Heater	1	65	65	48.8
CIP Tank Heater	1	25	25	18.8
Chemical Storage Heaters	1	25	25	18.8
Total Load			**272**	**204**

7.3.2.2 Opinion of Probable Cost

An opinion of probable cost is shown in Table 7-5 below. The generators would be cycled on and off throughout the year, with an anticipated annual O&M cost of about $1,000.

TABLE 7-5. OPINION OF PROBABLE COST – BACK-UP POWER GENERATORS

Item	Location	Quantity	Units	Unit Price	Total Costs
80 kW Generator	Intake Facilities	1	EA	$30,000	$30,000
Misc. Site Work/Pad	Intake Facilities	1	LS	$5,000	$5,000
300 kW Generator	Treatment Plant	1	EA	$75,000	$75,000
Misc. Site Work/Pad	Treatment Plant	1	LS	$10,000	$10,000
				Sub-Total Construction Costs	**$120,000**
				Contractor Mob/Demob (5%)	$6,000
				Buy American Provisions (5%)	$6,000
				Davis-Bacon Wages (5%)	$6,000
				Contingencies (20%)	$24,000
				Total Construction Costs	**$162,000**
				Engineering (17.5%)	$28,350
				Funding, Legal, Admin, Bonding (10%)	$16,200
				Total Project Capital Costs	**$206,550**

7.4 WATER TREATMENT

7.4.1 "Do-Nothing"

The City is in compliance with all general water quality parameters. The plant is operating satisfactorily and does not require any upgrades or improvements to continue to provide the City with high quality drinking water. There are some upgrades noted below related to improved operation and future operation at the same capacity.

7.4.2 Surface Water Screening

7.4.2.1 Description of Option

As described in Chapter 6, the inlet and outlet solenoid control valve used to flush the 800 micron basket strainer periodically plugs with material, causing reduced flush efficiency and sometimes causes the screen to completely blind.

In order to improve flush efficiency and to reduce the occurrence of screen blinding, one possible solution would be to replace the flush line solenoid valves with motorized ball valves.

7.4.2.2 Opinion of Probable Cost

An opinion of probable cost is provided in Table 7-6.

There are no significant operation and maintenance cost changes associated with the proposed surface water screening improvements.

TABLE 7-6. OPINION OF PROBABLE COST - SURFACE WATER SCREENING

Item	Quantity	Units	Unit Price	Total Costs
Motorized Ball Valves	4	EA	$4,900	$19,600
			Sub-Total Construction Costs	**$19,600**
			Contractor Mob/Demob (5%)	$980
			Buy American Provisions (5%)	$980
			Davis-Bacon Wages (5%)	$980
			Contingencies (20%)	$3,920
			Total Construction Costs	**$26,460**
			Engineering (10%)	$2,646
			Funding, Legal, Admin, Bonding (10%)	$2,646
			Total Project Capital Costs	**$31,752**

7.4.3 Filtration

7.4.3.1 Description of Option

The microfiltration plant's membranes are now over ten years old. GE/Zenon, the membrane manufacturer, has limited information about life expectancy of membranes beyond 12 years of operation. Considering this lack of long term data, the City should begin budgeting immediately to replace the membrane portion of the system. As part of the master planning effort, GE was contacted to get pricing for membrane replacement. GE provided a price to replace all of the membranes at once. GE recommends replacing them all at once for the following reasons:

- To minimize risk of preferential flow between old and new fibers. GE's cost proposal is based on their next generation 500d module not the 500c modules currently installed. The 500d cassettes have more surface area per unit and GE would provide fewer units with the total surface area being slightly more. This will allow the City to run the same flow at a lower per unit (flux) throughput. This helps with membrane line but mixing old and new may cause un-equal flow challenges.
- Also new membranes are installed with some slack as over time there is some shrinkage of the length. Mixing old and new modules can complicate slack management.

The downside of replacing all the fibers at once is the high cost. The cost quoted by GE for full replacement (which does get the City an additional 8% surface area) is $449,550. GE notes at a minimum the fibers need to be replaced at the train level (in the case of Glenns Ferry 50 percent of the system at a time) or the cassette level (12.5 percent at a time for Glenns Ferry). The costs shown below could potentially be phased at roughly 50 percent of the value shown (two events) or 1/8 of value shown (8 events). It will likely cost more in total to phase the install as more trips from GE are required to assist with the install.

7.4.3.2 Opinion of Probable Cost

An opinion of probable cost for the 100% membrane replacement is shown in Table 7-7. Table 7-8 shows an opinion of probable cost for replacing the membranes one train at a time with the replacements staggered 3 years apart.

TABLE 7-7. OPINION OF PROBABLE COST – 100% MEMBRANE CHANGEOUT

Item	Quantity	Units	Unit Price	Total Costs
100% Membrane Replacement	1	LS	$450,000	$450,000
			Sub-Total Construction Costs	**$450,000**
			Contingencies (20%)	$90,000
			Total Construction Costs	**$540,000**
			Engineering (5%)	$27,000
			Funding, Legal, Admin, Bonding (10%)	$54,000
			Total Project Capital Costs	**$621,000**

TABLE 7-8. OPINION OF PROBABLE COST – 50% MEMBRANE CHANGEOUTS

Item	Quantity	Units	Unit Price	Total Costs
50% Membrane Replacement	1	LS	$225,000	$225,000
50% Membrane Replacement	1	LS	$236,250	$236,250
			Sub-Total Construction Costs	**$461,250**
			Contingencies (20%)	$92,250
			Total Construction Costs	**$553,500**
			Engineering (5%)	$27,675
			Funding, Legal, Admin, Bonding (10%)	$55,350
			Total Project Capital Costs	**$636,525**

7.4.4 Chlorine Contact Chamber

7.4.4.1 Description of Option

In order to allow a portion of the upper half of the chlorine contact chamber volume to flow to the finished water pump station in the event of a disruption to the plant filtration production, the fixed weir at the outlet of the tank should be converted to a downward opening weir gate.

7.4.4.2 Opinion of Probable Cost

An opinion of the probable cost associated with this conversion is shown in Table 7-9.

TABLE 7-9. OPINION OF PROBABLE COST - CHLORINE CONTACT CHAMBER

Item	Quantity	Units	Unit Price	Total Costs
Demo Existing Gate	1	EA	$2,000	$2,000
Downward Opening Weir Gate	1	EA	$10,000	$10,000
			Sub-Total Construction Costs	**$12,000**
			Contractor Mob/Demob (5%)	$600
			Buy American Provisions (5%)	$600
			Davis-Bacon Wages (5%)	$600
			Contingencies (20%)	$2,400
			Total Construction Costs	**$16,200**
			Engineering (10%)	$1,620
			Funding, Legal, Admin, Bonding (10%)	$1,620
			Total Project Capital Costs	**$19,440**

7.5 DISTRIBUTION PUMP STATION

7.5.1 "Do-Nothing"

The distribution pumps located in the water treatment plant building appear to be operating satisfactorily, and no upgrades are anticipated for the foreseeable future.

7.6 DISTRIBUTION SYSTEM

7.6.1 "Do-Nothing"

Although the City currently meets the Idaho State Standards for minimum pressures of 40 psi for both existing conditions and the entire 40-year planning period, there are several fire flow deficiencies throughout the system, as pointed out in Chapter 6.

Distribution system improvements will be broken into three categories: Fire flow improvements, age and condition improvements, and non-deficiency related projects.

7.6.2 Basic Fire Flow Improvements

7.6.2.1 Description of Option

In order to eliminate the deficiencies of the City's water system during fire flow situations, all 2 inch and 4 inch waterlines that supply fire flow to hydrants should be upsized to a minimum of 8 inch pipe. This would accommodate the requirement of 6 inch diameter pipe to supply fire hydrants, as well as increase and improve overall system pressures. By doing this in the model, all fire flow deficiencies up to and including the 3,000 gpm fire flow recommended at the Carmela Winery by the ISRB, were corrected except for one. These results are shown in Figure 7-1, with the remaining deficient node displayed in red. This initial set of fire flow improvements would also eliminate significant length of the aging infrastructure identified in Chapter 6.

In order to correct the final fire flow deficiency, an 8 inch diameter segment of pipe was added to West Idaho Avenue to create a new loop. The new segment connects the existing line that supplies the recreation center and the line directly to the west, a distance of about 280 feet.

7.6.2.2 Opinion of Probable Cost

Table 7-10 shows the recommended projects to be completed to fix the existing deficiencies that exist in the City's water system during a fire flow event, as well as an opinion of probable costs. There are no significant operation and maintenance cost changes associated with the proposed fire flow improvements.

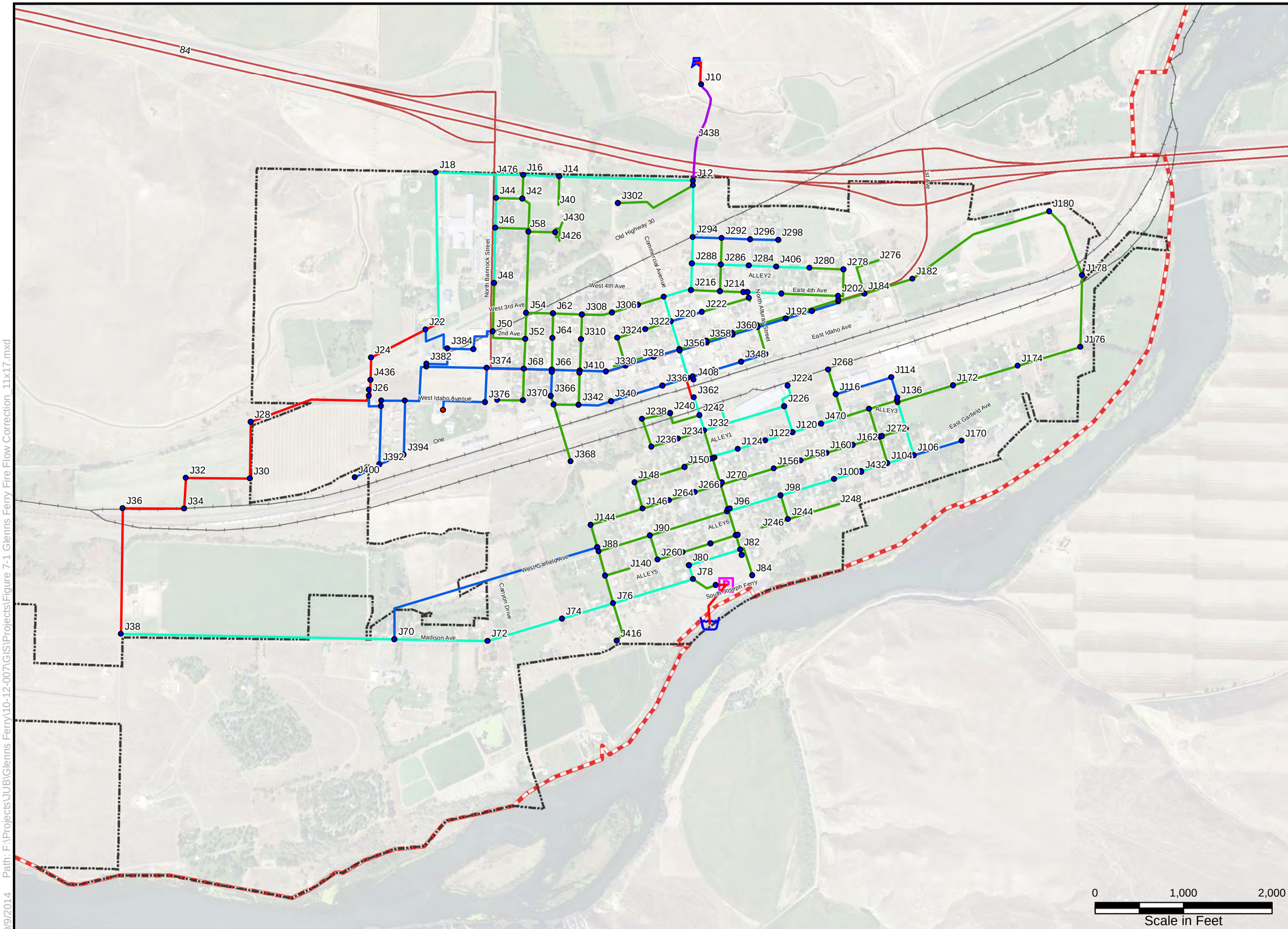
TABLE 7-10. OPINION OF PROBABLE COST – BASIC FIRE FLOW IMPROVEMENTS

Description of Improvement	Length of Pipe (ft)	Unit Price	Total Costs
Replace Old 2" Pipe with 8" PVC	4,936	$50.00	$246,800
Replace Old 4" Pipe with 8" PVC	28,903	$50.00	$1,445,150
Create 8" Loop in West Idaho Avenue	280	$40.00	$11,200
		Sub-Total Construction Costs	**$1,703,150**
		Contractor Mob/Demob (5%)	$85,158
		Buy American Provisions (5%)	$85,158
		Davis-Bacon Wages (5%)	$85,158
		Contingencies (20%)	$340,630
		Total Construction Costs	**$2,299,253**
		Engineering & Const. Mngt. (17.5%)	$402,369
		Funding, Legal, Admin, Bonding (10%)	$229,925
		Total Project Capital Costs	**$2,931,547**

FIGURE 7-1

CITY OF GLENNS FERRY FIRE FLOW AFTER UPSIZING

WATER SYSTEM FACILITIES PLAN



Legend

Junction

Available Flow

- Less Than 1,000 gpm
- Greater Than 1,000 gpm

Pipe

Diameter

- 6
- 8
- 10
- 12
- 14

- Water Tank
- Snake River Intake/ Spring Infiltration Gallery
- Pump/Treatment Plant
- City Limits
- Planning Area

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7.6.3 Idahoan Processing Plant Fire Flow Improvements

7.6.3.1 Description of Option

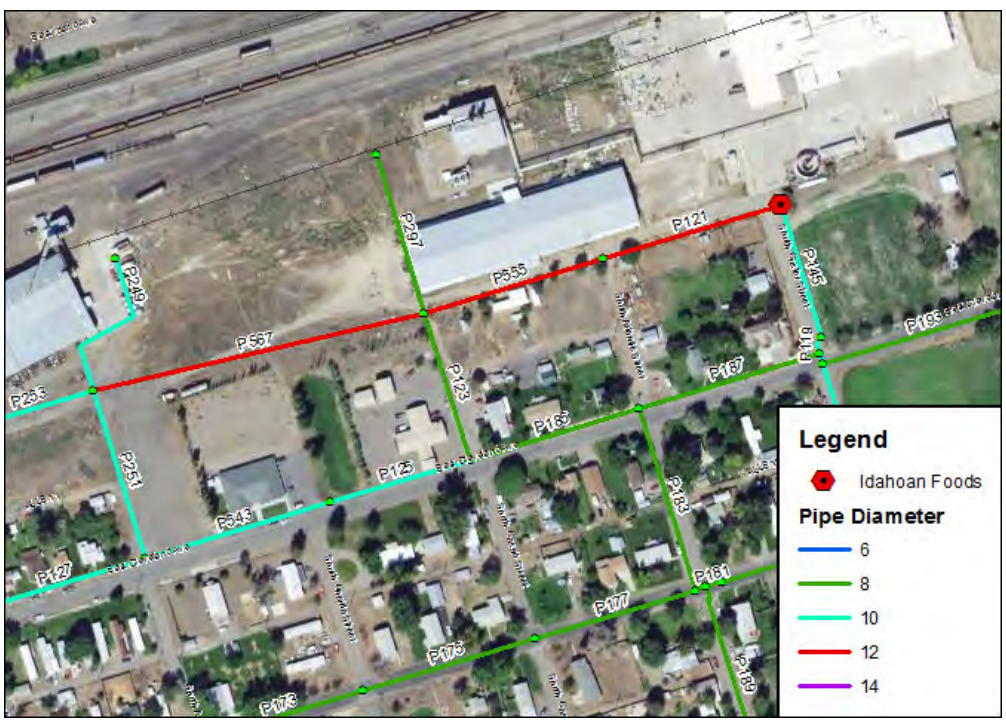
Because the currently abandoned Idahoan Foods potato processing plant's ISRB recommended fire flow (5,500 gpm) was so much higher than any other structure in the City, it was determined that the improvements involved with correcting this deficiency should be addressed separately from the basic fire flow improvements.

Table 7-11 summarizes the improvements required to meet ISRB's fire flow recommendation for the old Idahoan Foods processing plant. Figure 7-2 shows a blown up view of the area of interest.

TABLE 7-11. IDAHOAN FOODS FIRE FLOW IMPROVEMENTS

Pipe ID	Description of Improvement	Length (ft)
P567	New 12" Pipe	600
P555	Upsize from 6" to 12" Pipe	330
P121	Upsize from 6" to 12" Pipe	330
P145	Upsize from 6" to 10" Pipe	240

FIGURE 7-2. IDAHOAN FOODS FIRE FLOW IMPROVEMENT AREA



7.6.3.2 Opinion of Probable Cost

Table 7-12 shows an opinion of probable cost for the improvements to supply the ISRB recommended fire flow to the old Idahoan Foods plant.

FIGURE 7-12. OPINION OF PROBABLE COST - IDAHOAN FOODS FIRE FLOW IMPROVEMENTS

Description of Improvement	Length of Pipe (ft)	Unit Price	Total Costs
Replace Old 6" Pipe with 12" Pipe	660	$58.00	$38,280
Replace Old 6" Pipe with 10" Pipe	240	$55.00	$13,200
Install new 12" Pipe	600	$50.00	$30,000
		Sub-Total Construction Costs	**$81,480**
		Contractor Mob/Demob (5%)	$4,074
		Buy American Provisions (5%)	$4,074
		Davis-Bacon Wages (5%)	$4,074
		Contingencies (20%)	$16,296
		Total Construction Costs	**$109,998**
		Engineering & Const. Mngt. (17.5%)	$19,250
		Funding, Legal, Admin, Bonding (10%)	$11,000
		Total Project Capital Costs	**$140,247**

7.6.4 Age and Condition Improvements

7.6.4.1 Description of Option

Because much of the system is greater than 50 years old and has begun to deteriorate, as discussed in Chapter 6, it is recommended that the City replace all pipes in the system that are listed as being in poor or unknown condition in Table 6-6. This does not include 2 inch and 4 inch lines, which are included in the fire flow improvements section.

7.6.4.2 Opinion of Probable Cost

Table 7-13 shows the length of each size pipe to be replaced, as well as an opinion of probable cost. There are no significant operation and maintenance cost changes associated with the proposed distribution system improvement projects.

TABLE 7-13. OPINION OF PROBABLE COST - DISTRIBUTION SYSTEM IMPROVEMENTS

Description of Improvement	Length of Pipe (ft)	Unit Price	Total Costs
Replace Old 6" Cast Iron Pipe with 8" PVC	3,912	$50.00	$195,600
Replace Old 6" Steel Pipe with 8" PVC	4,450	$50.00	$222,500
Replace Old 8" Cast Iron Pipe with 8" PVC	120	$50.00	$6,000
Replace Old 8" Steel Pipe with 8" PVC	3,146	$50.00	$157,300
Replace Old 10" Steel Pipe with 10" PVC	4,640	$55.00	$255,200
		Sub-Total Construction Costs	**$836,600**
		Contractor Mob/Demob (5%)	$41,830
		Buy American Provisions (5%)	$41,830
		Davis-Bacon Wages (5%)	$41,830
		Contingencies (20%)	$167,320
		Total Construction Costs	**$1,129,410**
		Engineering & Const. Mngt. (17.5%)	$197,647
		Funding, Legal, Admin, Bonding (10%)	$112,941
		Total Project Capital Costs	**$1,439,998**

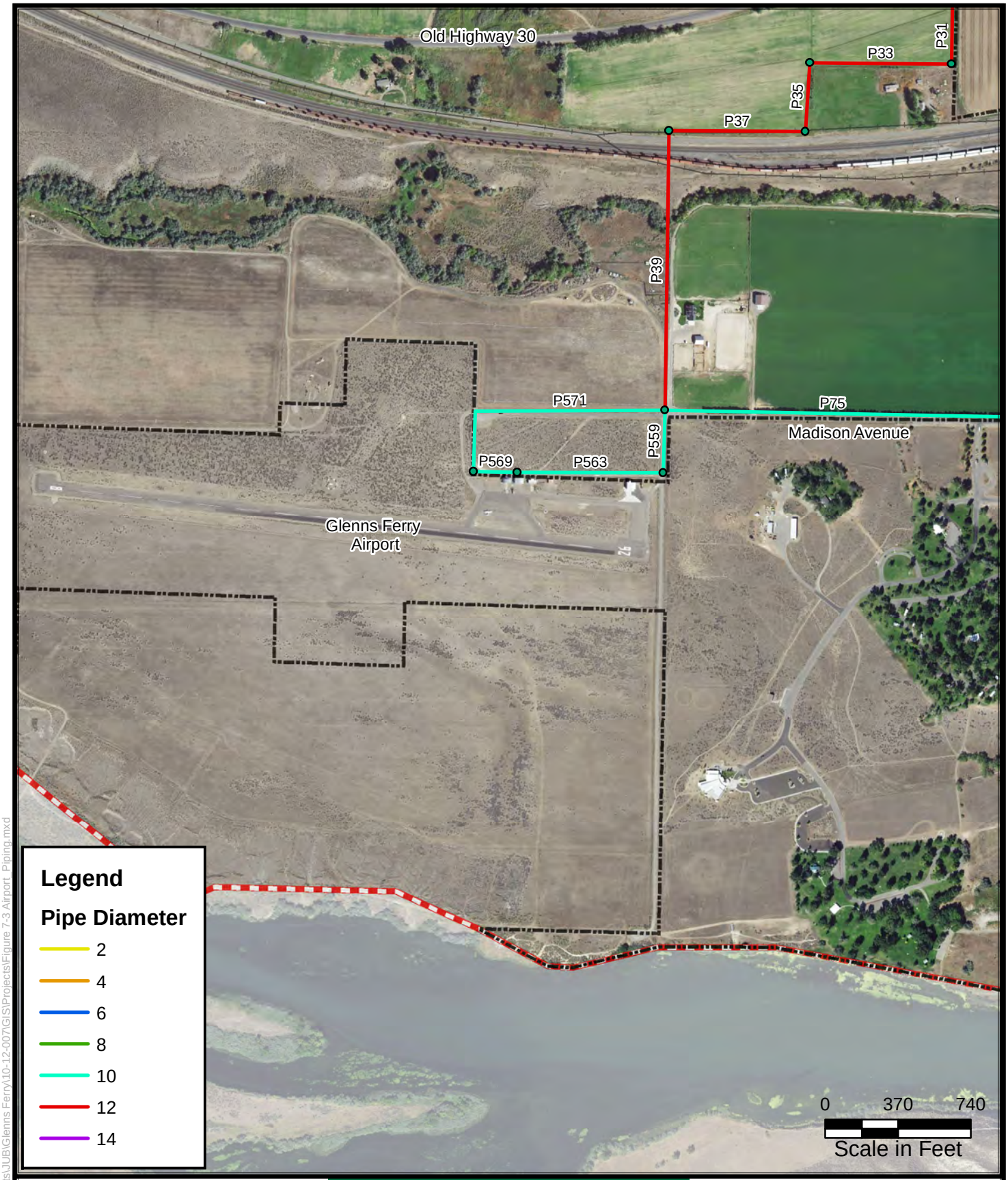
7.6.5 Airport Piping

7.6.5.1 Description of Option

The proposed water line to the airport was sized to supply a fire flow of 3,000 gpm to the airport facilities. It consists of a new 10 inch line running south from the existing line in Madison Avenue, turning west and running north of the existing airport structures, before making a loop and tying back into the line in Madison Avenue. Table 7-14 gives a summary of the components involved with the new airport waterline. Figure 7-3 shows these improvements.

TABLE 7-14. SUMMARY OF AIRPORT PIPING

Pipe ID	Description of Improvement	Length (ft)
P559	New 10" Pipe	320
P563	New 10" Pipe	745
P569	New 10" Pipe	220
P571	New 10" Pipe	1270



WATER SYSTEM FACILITIES PLAN

FIGURE 7-3

AIRPORT PIPING

J-U-B ENGINEERS, INC.

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7.6.5.2 Opinion of Probable Cost

The expected costs associated with these new airport lines are presented in Table 7-15. There are no significant operation and maintenance cost changes associated with the proposed airport piping project.

TABLE 7-15. OPINION OF PROBABLE COST - AIRPORT PIPING

Description of Improvement	Length of Pipe (ft)	Unit Price	Total Costs
New 10" line to create loop to airport	2,555	$45.00	$114,975
		Sub-Total Construction Costs	**$114,975**
		Contractor Mob/Demob (5%)	$5,749
		Buy American Provisions (5%)	$5,749
		Davis-Bacon Wages (5%)	$5,749
		Contingencies (20%)	$22,995
		Total Construction Costs	**$155,216**
		Engineering & Const. Mngt. (17.5%)	$27,163
		Funding, Legal, Admin, Bonding (10%)	$15,522
		Total Project Capital Costs	**$197,901**

7.6.6 Head Loss Considerations

Results of the future peak hour demand model indicated that several pipes in the system experienced a head loss of greater than the recommended 2.6 psi/1,000 feet of pipe at the end of the 40-year distribution system planning period. These pipes all fall into either the fire flow improvements category or the age and condition improvements category, and therefore are not considered as independent projects.

7.7 PRESSURE ZONES

7.7.1 "Do-Nothing"

The City's water system appears to be operating satisfactorily using the current single pressure zone. Therefore, no pressure zone improvements are anticipated for the foreseeable future.

7.8 CONTROL SYSTEM

7.8.1 "Do-Nothing"

The City's current SCADA and control system operates satisfactorily and does not require any improvements to continue functioning. As mentioned in Chapter 6, software upgrades are currently being performed on the existing SCADA system, the costs for which are coming from the system operations and maintenance budget.

Chapter 8

Implementation of Water System Improvements

8.0 IMPLEMENTATION OF WATER SYSTEM IMPROVEMENTS

8.1 RECOMMENDED WATER SYSTEM IMPROVEMENTS

This Water Master Plan has indicated that the City is in compliance with the majority of general water quality and water supply parameters. However, there are a few areas of concern regarding the water system, including:

- The data indicates that some disinfection byproducts in the City's finished water has approached the MCL of 80 µg/L for TTHM. If the concentration of disinfection byproducts continues to be a problem, the City has the option of utilizing its currently unused PAC system. Organics which likely cause the disinfection byproducts as they are oxidized by the sodium hypochlorite injected into the water later in the treatment process, can be absorbed and removed from the plant influent through use of the PAC system.
- Depending on which ISRB fire flow recommendation the City chooses to use to plan for the future, additional storage may be required to ensure there is sufficient fire suppression storage. Three different options are outlined in the sections that follow that either do not require additional storage, require a new 250,000 gallon storage reservoir, or require a new 1 million gallon storage reservoir to add more reliability and safety to the system.
- It is recommended that the City install two permanent back-up power generators for the water system; one at the intake facilities and the other at the water treatment plant. These generators will improve system reliability in the event of a prolonged power outage.
- It is recommended that the City begin budgeting for membrane replacement for the water treatment plant. The existing membranes are now over ten years old and are approaching their expected design life. There are also some other minor treatment improvements that are recommended. Replacement costs are included in the facilities plan analysis as a project.
- The City is unable to deliver fire flow to some of the largest fire demands recommended by ISRB. The system also fails to meet the basic fire flow of 1,000 gpm at several locations throughout the City. It is recommended that the City upsize all 2 inch and 4 inch lines that supply fire hydrants to 8 inches, in order to meet the standard of 6 inch lines to supply fire flow as well as to allow for future growth and added safety.
- Much of the existing distribution system is greater than 50 years old and has begun to deteriorate. It is recommended that all pipes that are in poor or unknown condition, be replaced with new pipe that is 8 inch diameter or larger. This will help reduce leaks, as well as improve overall system flows.
- In addition to correcting deficiencies in the existing system, it is also recommended that a new water line be installed to the airport from the existing line in Madison Avenue. This line will provide water for everyday use as well as for fire suppression.

8.2 RECOMMENDATION OPTIONS

8.2.1 Option 1

8.2.1.1 Improvements Included in Option 1

The first option examined will combine the "Do-Nothing" alternative for storage, the installation of two back-up power generators, all water treatment improvements, basic fire flow improvements, distribution system age and condition improvements, and new piping to the airport, as described in the previous chapter.

8.2.1.2 Opinion of Probable Costs

Table 8-1 combines the cost estimates for the included alternatives listed above into an overall opinion of probable cost for Option 1.

TABLE 8-1. OPINION OF PROBABLE COSTS - OPTION 1

System Improvement	Capital Costs[1]
Back-Up Power Generators	$.207M
Water Treatment Alternatives[2]	$.672M
Basic Fire Flow Improvements	$2.932M
Age and Condition Improvements	$1.44M
Airport Piping	$.198M
Total Cost of Improvements	**$5.448M**

1. Costs Include: Construction, engineering, inspection, and contingency
2. Water Treatment Alternatives includes the 100% membrane replacement option. There are other phased membrane replacement options discussed in Chapter 7.

8.2.1.3 Monthly User Charge Rate Analysis

Single-family residential connections (e.g., one equivalent dwelling unit, or EDU) are currently charged a base monthly user rate of $36 per month. Other entities within the City can be billed different monthly rates based on the size of their water meter.

Changes to the monthly user rates were estimated for the water system improvements described for this option. For comparison purposes, two financing scenarios were considered for the proposed improvements. The two scenarios were based on the source and amount of funding procured for the project:

1. Scenario 1 – No grant funding would be secured and the project would be funded entirely through low-interest loans.
2. Scenario 2 – Approximately half of the project will be funded through grants and the remaining portion would be funded through low interest loans.

There may be other project financing combinations that should be explored by the City. These two scenarios are simply used to illustrate possible changes to the monthly user rates for the

water system improvements. Table 8-2 summarizes the results of the user charge rate analysis for the two financing alternatives for this option.

TABLE 8-2. MONTHLY USER RATE CHARGE ANALYSIS - OPTION 1

Item	Funding Scenario #1	Funding Scenario #2
Total Capital Cost of Improvements	$5.4M	$5.4M
Loan/Grant	$5.4M/$0.0M	$2.7M/$2.7M
Loan Term	30 years	40 years
Loan Rate	2%	3%
Annualized Capital	$243,261	$117,851
Annual O&M[1]	$1,000	$1,000
Total Annual Costs	$244,261	$118,851
# of EDUs	748	748
$/EDU/Month Increase	$27.21	$13.24

1. This O&M cost is incremental to any current ongoing O&M costs being incurred by the City.

8.2.2 Option 2

8.2.2.1 Improvements Included in Option 2

The second option explored combines the construction of a new 250,000 gallon storage reservoir (based on Carmela Winery ISRB fire flow), the installation of two back-up power generators, all water treatment improvements, basic fire flow improvements, distribution system age and condition improvements, and new piping to the airport, as discussed in Chapter 7.

8.2.2.2 Opinion of Probable Costs

Table 8-3 that follows shows an opinion of probable costs for the selected improvements associated with this option.

8.2.2.3 Monthly User Charge Rate Analysis

Table 8-4 summarizes the results of a user charge rate analysis for Option 2, identical to the one performed above for Option 1, using the same two financing alternatives described.

TABLE 8-3. OPINION OF PROBABLE COSTS - OPTION 2

System Improvement	Capital Costs[1]
New 250,000 gallon Storage Reservoir	$.473M
Back-Up Power Generators	$.207M
Water Treatment Alternatives[2]	$.672M
Basic Fire Flow Improvements	$2.932M
Age and Condition Improvements	$1.44M
Airport Piping	$.198M
Total Cost of Improvements	**$5.922M**

1. Costs include: Construction, engineering, inspection, and contingency
2. Water Treatment Alternatives includes the 100% membrane replacement option. There are other phased membrane replacement options discussed in Chapter 7.

TABLE 8-4. MONTHLY USER RATE CHARGE ANALYSIS - OPTION 2

Item	Funding Scenario #1	Funding Scenario #2
Total Capital Cost of Improvements	$5.9M	$5.9M
Loan/Grant	$5.9M/$0.0M	$2.95M/$2.95M
Loan Term	30 years	40 years
Loan Rate	2%	3%
Annualized Capital	$264,396	$128,090
Annual O&M[1]	$1,000	$1,000
Total Annual Costs	$265,396	$129,090
# of EDUs	748	748
$/EDU/Month Increase	$29.57	$14.38

1. This O&M cost is incremental to any current ongoing O&M costs being incurred by the City.

8.2.3 Option 3

8.2.3.1 Improvements Included in Option 3

The third and final option examined includes the construction of a new 1 million gallon storage reservoir (based on Idahoan Foods ISRB fire flow), the installation of two back-up power generators, all water treatment improvements, basic fire flow improvements, fire flow improvements specific to the old Idahoan Foods potato processing plant, distribution system age and condition improvements, and new piping to the airport, as described in Chapter 7.

8.2.3.2 Opinion of Probable Costs

Cost estimates for all of the alternatives associated with Option 3 have been combined below in Table 8-5.

TABLE 8-5. OPINION OF PROBABLE COSTS - OPTION 3

System Improvement	Capital Costs[1]
New 1 Million Gallon Storage Reservoir	$1.721M
Back-Up Power Generators	$.207M
Water Treatment Alternatives[2]	$.672M
Basic Fire Flow Improvements	$2.932M
Idahoan Foods Plant Fire Flow Improvements	$.14M
Age and Condition Improvements	$1.44M
Airport Piping	$.198M
Total Cost of Improvements	**$7.31M**

1. Costs include: Construction, engineering, inspection, and contingency.
2. Water Treatment Alternatives includes the 100% membrane replacement option. There are other phased membrane replacement options discussed in Chapter 7.

8.2.3.3 Monthly User Charge Rate Analysis

Table 8-6 provides the results of a user charge rate analysis for this option, identical to the ones performed for Option 1 and Option 2 above.

TABLE 8-6. MONTHLY USER RATE CHARGE ANALYSIS - OPTION 3

Item	Funding Scenario #1	Funding Scenario #2
Total Capital Cost of Improvements	$7.3M	$7.3M
Loan/Grant	$7.3M/$0.0M	$3.65M/$3.65M
Loan Term	30 years	40 years
Loan Rate	2%	3%
Annualized Capital	$326,377	$158,117
Annual O&M[1]	$1,000	$1,000
Total Annual Costs	$327,377	$159,117
# of EDUs	748	748
$/EDU/Month Increase	$36.47	$17.73

1. This O&M cost is incremental to any current ongoing O&M costs being incurred by the City.

8.2.4 Summary of Options

Table 8-7 summarizes the improvements included in each option, along with total capital costs and expected increases in user rates.

TABLE 8-7. SUMMARY OF IMPROVEMENT OPTIONS

Option	Parameter	Funding Scenario #1	Funding Scenario #2
Option 1	Improvements Included	Back-up power, water treatment, basic fire flow, distribution condition, airport piping	
	Capital Cost	$5.45M	
	Projected User Rate Increase	$27.21	$13.24
Option 2	Improvements Included	250K gallon reservoir, back-up power, water treatment, basic fire flow, distribution condition, airport piping	
	Capital Cost	$5.92M	
	Projected User Rate Increase	$29.57	$14.38
Option 3	Improvements Included	1 MG reservoir, back-up power, water treatment, basic fire flow, Idahoan Foods fire flow, distribution condition, airport piping	
	Capital Cost	$7.31M	
	Projected User Rate Increase	$36.47	$17.73

8.3 PROJECT FINANCING

The City could consider making application for financing of the proposed improvements, including both loans and grants, to minimize the costs to the community. Assessment of fees to new development may also be used to replace and/or upgrade the existing system.

Potential sources of funding include the IDEQ Revolving Loan fund, U.S. Department of Agriculture Rural Development Agency (RD) loans and grants, Department of Commerce and Labor Community Development Block Grant Program, Department of Commerce Economic Development Administration Grants, EPA State and Tribal Assistance Grants (STAG), U.S. Forest Service, and other non-governmental sources such as private bond markets. Some funding sources have requirements such as completion of an environmental document in accordance with the National Environmental Policy Act (NEPA). Some also have requirements to source labor in accordance with prevailing wages (i.e., Davis-Bacon wages) or purchase equipment substantially manufactured in the United States. These requirements tend to increase costs, which could therefore cause the costs provided in chapter 7 and Chapter 8 to escalate if these requirements are in force. The City should consult qualified financial professionals, or the potential funding agencies, for additional guidance on what type of funding is best for the community.

The Idaho Department of Environmental Quality has funds available through their Revolving Loan Fund. This program provides below market rate interest loans to Idaho communities to build new, or repair, existing water and wastewater facilities. The loan term is 20 years, however, some applicants may qualify as disadvantaged and be eligible for reduced loan terms. The funding is derived from an appropriation from the EPA (80%) and a 20% match from the Water Pollution Control Account.

The Rural Development Agency makes loans and grants to public bodies and non-profit organizations in rural areas to construct or improve facilities that are modest in size, cost, and design. Water and Waste Disposal (WWD) loans and grants may be used to construct, repair, improve, expand, or otherwise modify rural water and wastewater facilities; pay necessary fees

and costs associated with the project; or finance facilities in conjunction with funds from other agencies or those provided by the applicant. The maximum loan term is 40 years and grant funds may be available for facilities serving the most financially needy communities.

The Idaho Community Development Block Grant program (ICDBG) assists Idaho Cities and Counties under 50,000 in population with the development of needed public infrastructure and housing in an effort to support local economic diversification and growth. The program is administered by the Department of Commerce and Labor Division of Community Development, with funds received annually from the U.S. Department of Housing and Urban Development. ICDBG funds are used to construct projects that benefit low and moderate income persons, help prevent or eliminate slum and blight conditions, or solve catastrophic health and safety threats in local areas.

The U.S. Department of Commerce Economic Development Administration (EDA) provides funding for the construction of public infrastructure under the authority of the Public Works and Economic Development Act of 1965. Eligible projects include water and wastewater improvement and projects that support economic development within the community. Cities, counties and special cities are eligible to apply. Projects must meet economic development eligibility criteria as established by Congress; specifically per capita income, employment and other demographic characteristics; with an emphasis on resolving unemployment and barriers to economic growth and stability. EDA funds are provided as grants of from 50 to 80 percent of the project. Applicants must provide the local share from acceptable sources, including cash, local government bonds, or a Community Development Block Grants.

The EPA provides STAG grant funds through their Office of Enforcement and Compliance Assurance (OECA) to carry out compliance assurance activities related to regional focus areas, potentially including water and wastewater systems. Eligible grant recipients include States, tribes, territories, local governments, and multi-jurisdictional organizations. The OECA typically announces the availability of grant funds for a specific focus area through a Federal Register Notice. Preference is generally given to those applicants that provide some match towards the grant.

Many of the funding agencies have affordability criteria which they may follow as they look at monthly user rate impacts. These criteria may include such things as local income levels and utility costs in nearby communities. As user rates exceed affordability criteria, the City may have the opportunity for grant funding for the proposed project.

The Idaho State Legislature ruled in March 1996 that communities can attach a price to new growth and development through the implementation of impact fees. The law allows government entities to charge a developer for a “proportionate share” of the cost of public facilities impacted by residential, commercial, and industrial building. The calculation of the proportionate share must be based on a sturdy planning foundation that includes a comprehensive land use plan, a capital improvements plan, and a cash flow analysis. The money must be spent on the specific project it was collected for within five years of collection.

Government entities may also charge a “new user capacity”, “capacity buy-in”, or “equity buy-in” fee to developers desiring to connect to water and wastewater systems. This fee typically accounts for the demand the new connection will place on a system, and the depreciated replacement value of the system at the time of connection. The funds collected from this fee are generally held in a separate account and used for replacement of the water or wastewater

system. The recommended charges are based on audited financial information and estimated system capacities.

8.4 ENVIRONMENTAL CONSIDERATIONS

The proposed improvements should have minimal environmental impacts from construction activities. Most of the proposed water main improvements are generally in existing road right of ways. The likely location for a new storage reservoir would be on the already City owned property on which the existing 500,000 gallon tank currently sits.

Air quality may be impacted during construction due to dust and exhaust emissions from construction equipment, which may produce some minor air pollution. Debris created by construction should not be burned, but transported to a disposal area to avoid further air pollution. The impacts of construction dust can be mitigated by ceasing activity during exceptionally windy condition and using watering equipment.

Open trenches, electrical utilities, and heavy equipment may present health and safety hazards during construction. These hazards may be mitigated by educating project personnel about the applicable health and safety regulations, and establishing safe operating procedures. Traffic control may also result in a safety hazard, as traffic patterns are altered for construction purposes.

It is anticipated that impacts on agricultural lands, cultural resources, wetlands, plants, or wildlife from the improvements will be minimal. If properly designed, operated, and maintained, the proposed improvements should have minimal impacts on the soil, groundwater, and surface water.

The primary locations of improvements are at sites where there are existing structures or streets. There is a possibility that some of the improvements will be constructed in areas where trees and vegetation have been planted and the area has been landscaped. In all areas where construction of the proposed improvements take place, an effort will be required to reconstruct, replant, and landscape the area to its former condition.

An Environmental Information Document (EID) will be prepared separately from this report for the specific improvements identified in the Water System Facilities Plan. The EID will evaluate potential environmental impacts and mitigation measures for the proposed improvements.

8.5 IMPLEMENTATION ISSUES

Implementation of the proposed projects is a function of regulatory approval, public acceptance, funding, and constructability. It is anticipated that the City will be able to obtain the necessary regulatory approval and permits for construction and operation of the proposed water system improvements.

8.6 PUBLIC PARTICIPATION

It is recommended that the City hold a public meeting such as an open house to explain the current conditions, deficiencies, alternatives, and costs. This feedback from the public can be

used in the EID and final funding assessment. A final public hearing on the rates is also recommended, and likely required, depending on the final funding package. The City could elect to gain public support for one of the options listed above and select an approach based on the public's input.

Appendix A

User Rate Resolution

RESOLUTION NO. 13-02

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF GLENNS FERRY, ELMORE COUNTY, IDAHO, ESTABLISHING WATER AND SEWER RATES FOR THE CITY; ESTABLISHING METHODS FOR ASSESSING WATER AND SEWER RATES FOR APARTMENTS, MOBILE HOME/TRAILER PARKS, AND RECREATIONAL VEHICLE PARKS; ESTABLISHING METHODS FOR ASSESSING SEWER RATES FOR BUSINESSES WITH SEWER FLOW METERS; MAKING RATE PROVISIONS FOR CURRENT RESIDENTIAL USERS THAT HAVE LARGER THAN THREE-QUARTER INCH METERS; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, the City of Glenns Ferry, Elmore County, Idaho (the "City"), is a municipal corporation duly organized and operating under the laws of the State of Idaho; and

WHEREAS, the City Council desires to increase water and sewer rates for the City; and

WHEREAS, a public hearing, duly noticed as required by law, was held on February 12, 2013 for consideration of the water and sewer rates to be established by the City;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF GLENNS FERRY, Elmore County, Idaho, as follows:

Section I: That, the City Council hereby establishes the following schedule for water rates:

Meter Size	.75 or less	1	1.25	1.5	2	3	4
Multiplier	1	1.8	2.8	4	7	16	28
Proposed Monthly 0 Base Rate	$36.00	$64.80	$100.80	$144.00	$252.00	$576.00	$1,008.00
Proposed Rate per 1,000 Gallons	$1.90	$1.90	$1.90	$1.90	$1.90	$1.90	$1.90

Section Ia: Water rates for apartments, mobile home/trailer parks, and recreational vehicle parks will be assessed by multiplying the monthly base rate of $36.00 by the total number of units and then adding the calculated rate per 1000 gallons of water used.

Section II: That, the City Council hereby establishes the following schedule for sewer rates:

Meter Size	.75 or less	1	1.25	1.5	2	3	4
Multiplier	1	1.8	2.8	4	7	16	28
Proposed Monthly 0 Base Rate	$16.50	$29.70	$46.20	$66.00	$115.50	$264.00	$462.00
Proposed Rate per 1,000 Gallons	$1.25	$1.25	$1.25	$1.25	$1.25	$1.25	$1.25

Section IIa: Sewer rates for apartments, mobile home/trailer parks, and recreational vehicle parks will be assessed by multiplying the monthly base rate of $16.50 by the total number of units and then adding the calculated rate per 1000 gallons of water used

Section IIb: Sewer rates will be assessed based on the effluent and the composition of the effluent for those businesses with sewer flow meters.

Section III: This Resolution is passed by the Council and approved by the Mayor this 26th, day of February, 2013. All provisions of this resolution shall become effective upon its approval and passage.

DATED this, 26th, of February, 2013.

CITY OF GLENNS FERRY
Elmore County, Idaho

Mayor Joanne Lanham

ATTEST:

City Clerk-Treasurer Debra Rowan

(SEAL)

Appendix B

Water System Budget

Water Department Budget

Utility Revenue	2013-2014 Budget	2013-2014 YTD	2013-2014 Projected	2014-2015 Budget		
Water & Irrigation Fees	$ 527,046.00	$ 258,181.00	$485,105.00	$ 542,857.00	$ 15,811.00	$ 325,654.00
Water Sales	$ 100.00	$ 557.00	$ 835.50	$ 100.00		
Water meter Installations	$ 2,000.00	$ 240.00	$ 360.00	$ 2,000.00		
Late Fees	$ 4,000.00	$ 3,250.00	$ 4,875.00	$ 4,500.00		
Irrigation Water	$ 20,100.00	$ 21,591.00	$ 21,591.00	$ 21,591.00		
Interest Revenue Allocation	$ -	$ 342.00	$ 513.00	$ -		
Interest Revenue - Irrigation	$ -	$ 100.00	$ 150.00	$ -		
DEQ Planning Grant	$ 20,000.00		$ -	$ 20,000.00		
Miscellaneous	$ 500.00	$ 1,213.00	$ 1,819.50	$ 500.00		
Irragation Funds	$ -	$ -	$ -	$ 100,000.00		
UTILITY REVENUE TOTALS	$ 573,746.00	$ 285,474.00	$515,249.00	$ 691,548.00	$ (58,497.00)	$ -

Non-Departmental Expenditures	2013-2014 Budget	2013-2014 YTD	2013-2014 Projected	2014-2015 Budget			
Salaries and Wages	$ 95,550.00	$ 53,221.00	$ 77,921.00	$ 81,600.00	$ (13,950.00)	-14.6%	
Employee payroll Benefits	$ 21,000.00	$ 12,217.00	$ 18,325.50	$ 18,000.00	$ (3,000.00)	-14.3%	
Employee Benefits	$ 29,100.00	$ 15,837.00	$ 23,755.50	$ 28,200.00	$ (900.00)	-3.1%	$ (17,850.00)
Employee Insurance Reimbursed	$ 603.00	$ -	$ -	$ 603.00	$ -	0.0%	
Unemployment Insurance	$ 2,072.00		$ -	$ -	$ (2,072.00)		
Liability Insurance Allocation	$ 3,500.00	$ -	$ 3,500.00	$ 3,500.00	$ -	0.0%	
Professional & Technical Service	$ 41,000.00	$ 2,583.00	$ 3,874.50	$ 41,000.00	$ -	0.0%	
Attorney	$ 600.00	$ 375.00	$ 562.50	$ 600.00	$ -	0.0%	
Lab Testing	$ 7,500.00	$ 2,686.00	$ 4,029.00	$ 7,500.00	$ -	0.0%	
DEQ Water Fee	$ 2,600.00	$ 2,588.00	$ 3,882.00	$ 2,600.00	$ -	0.0%	
Travel,Training,& Meetings	$ 1,600.00	$ 614.00	$ 921.00	$ 1,600.00	$ -	0.0%	
Drug Testing Program	$ 100.00	$ -	$ -	$ 100.00	$ -	0.0%	
Utilities	$ 45,346.00	$ 28,373.00	$ 42,559.50	$ 47,160.00	$ 1,814.00	4.0%	
Telephone	$ 1,800.00	$ 1,946.00	$ 2,919.00	$ 3,000.00	$ 1,200.00	66.7%	
Equipment	$ 15,000.00	$ 873.00	$ 10,000.00	$ 15,000.00	$ -	0.0%	
Equipment Repair & Maintenance	$ 10,000.00	$ 22,118.00	$ 33,177.00	$ 10,000.00	$ -	0.0%	
Heating Fuel	$ 949.00	$ 1,792.00	$ 1,800.00	$ 949.00	$ -	0.0%	
Printing	$ 500.00	$ 696.00	$ 800.00	$ 500.00	$ -	0.0%	
County Solid Waste Fee	$ 27.00	$ 27.00	$ 27.00	$ 27.00	$ -	0.0%	
Fuel	$ 4,700.00	$ 2,135.00	$ 2,950.00	$ 4,000.00	$ (700.00)	-14.9%	
Office Supplies and Expenses	$ 1,000.00	$ 1,230.00	$ 1,500.00	$ 1,000.00	$ -	0.0%	
Waterworks Supplies	$ 26,330.00	$ 16,877.00	$ 25,315.50	$ 28,000.00	$ 1,670.00	6.3%	
Miscellaneous	$ 1,000.00	$ 334.00	$ 501.00	$ 1,000.00	$ -	0.0%	
Dues,Subscriptions& Memderships	$ 500.00	$ 409.00	$ 615.00	$ 500.00	$ -	0.0%	
Depreciation	$ 74,654.00	$ -	$ 74,654.00	$ 106,294.00	$ 31,640.00	42.4%	
Water Project reserve	$ -	$ -	$ -	$ -	$ -	#DIV/0!	
Bond Interest Expense (payment)	$ 91,650.00	$ 29,618.00	$ 91,650.00	$ 90,625.00	$ (1,025.00)	-1.1%	
Interest Expense (reserve)	$ 9,165.00	$ -	$ 9,165.00	$ -	$ (9,165.00)	-100.0%	
Contingency	$ -	$ -	$ -	$ 10,190.00	$ 10,190.00	#DIV/0!	
Expenditures Totals	$ 487,846.00	$ 196,549.00	$434,404.00	$ 503,548.00	$ 15,702.00	3.2%	
					$ -		
Capital Improvements					$ -		
Lab Testing	$ 200.00	$ -	$ -	$ 200.00	$ -		
Engineering	$ 5,000.00		$ 3,000.00	$ 5,000.00	$ -		
Leased Equipment	$ -	$ -	$ -	$ -	$ -		
Equipment Repair&Maintenance	$ 2,000.00	$ -	$ 2,000.00	$ 2,000.00	$ -		
Fuel	$ 3,000.00	$ -	$ 3,000.00	$ 3,000.00	$ -		
Supplies new Construction	$ 60,000.00	$ -	$ 60,000.00	$ 60,000.00	$ -		
Contractors	$ -	$ -	$ -	$ -	$ -		
Miscellaneous	$ 800.00	$ -	$ -	$ 800.00	$ -		
Capital Improvement Totals	$ 71,000.00	$ -	$ 68,000.00	$ 71,000.00	$ -		
					$ -		
Irrigation Water Department					$ -		
Pumping Fees	$ 14,250.00	$ 15,000.00	$ 15,000.00	$ 16,000.00	$ 1,750.00		
Fuel	$ 150.00	$ -	$ -	$ 500.00	$ 350.00		
Repair supplies	$ 500.00	$ 25.00	$ 200.00	$ 500.00	$ -		
New Line Supplies	$ -	$ -	$ -	$ 100,000.00	$ 100,000.00		
Miscellaneous	$ -	$ -	$ -	$ -	$ -		
Irrigation Water Department Totals	$ 14,900.00	$ 15,025.00	$ 15,200.00	$ 117,000.00	$ 102,100.00	$ 102,100.00	
WATER BUDGET TOTALS	$ 573,746.00	$ 211,574.00	$517,604.00	$ 691,548.00	$ 56,142.00		
				$ -			

Appendix C

Sanitary Survey

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1445 North Orchard • Boise, Idaho 83706 • (208) 373-0550

C.L. "Butch" Otter, Governor
Toni Hardesty, Director

June 15, 2011

Glenns Ferry, City of
Attn: Jeff Cook
P.O. Box 910
Glenns Ferry, ID 83623

PWS# ID4200022

Subject: Enhanced Sanitary Survey conducted on May 17, 2011

Dear Mr. Cook:

A copy of the Enhanced Sanitary Survey form, the photo log and photos for Public Water System *(ID4200022)* are enclosed with this mailing for your records. Attached, you will find a list of the significant deficiencies and/or recommended improvements for your system.

Please consult with your regulating agency regarding the significant deficiencies identified in this written notification. Upon agreement between the public water system and the regulating agency, please provide a written corrective action plan to the regulating agency that addresses all significant deficiencies. This consultation with the regulating agency shall be completed within 30 days of receiving this written notification. This request is Pursuant to IDAPA 58.01.08.323 for groundwater systems and IDAPA 58.01.08.302 for surface water systems.

For all new water systems or modifications to existing water systems, an engineering report shall be submitted to the Department of Environmental Quality (DEQ) for review and approval prior to or concurrent with the submittal of plans and specifications as required in Subsection 503.03, pursuant to IDAPA 58.01.08.503.

Prior to construction of new public water supply systems or modifications of existing public water supply systems, plans and specifications must be submitted to the DEQ for review, and approved, pursuant to IDAPA 58.01.08.504.

Thank you for your time and cooperation in the completion of this survey. If you have any questions, please contact me at (208) 373-0568 or via e-mail at brandon.lowder@deq.idaho.gov.

Sincerely,

Brandon Lowder
Drinking Water Analyst
Idaho Department of Environmental Quality

Enclosures: Required and Recommended Improvements
Enhanced Sanitary Survey Inspection Form

C: TRIM # 2011ACA1876

June 15, 2011
Glenns Ferry, City of
PWS# 4200022

RE: Enhanced Sanitary Survey conducted on May 17, 2011

You will find a list of the significant deficiencies, deficiencies and recommended improvements for your system summarized below. In order to address all significant deficiencies, follow steps 1, 2 & 3.

Step 1: After reviewing the significant deficiencies listed below, please call our office to identify a corrective action plan for each significant deficiency within 30 days of receiving this written notification. During that call, please be prepared to provide a "Planned Completion Date" for each item.

Step 2: Complete the planned action(s) by the agreed upon date.

Step 3: Enter an "Actual Completion Date", Initials, identify the "Corrective action taken", and sign that each corrective action has been corrected by the agreed upon date and that the corrective action meets the requirements pursuant to IDAPA 58.01.08. Please send a copy of the corrective action taken to the regulating agency.

Significant Deficiencies

Surface Water Source:

The backwash feed line does not appear to have adequate backflow protection.

Note: The 800 um filter potable feed line for backwashing is only protected by a double check valve. Because of the high risk of non-potable cross connection a more protective device, such as a reduced pressure assembly, shall be installed.

Planned Completion Date: _____,

Actual Completion Date: _____, *Initials*_____.
Corrective action taken:

Distribution:

#17: The system does not have a cross connection control program.

Note: A cross connection control program must be developed and implemented for your system. You can reference the rules regarding this program at IDPA 58.01.08.552.06, or the EPA Cross Connection Control Manual at http://www.epa.gov/ogwdw/crossconnection.html for help in developing this program.

Planned Completion Date: _____,

Actual Completion Date: _____, *Initials*_____.
Corrective action taken:

I certify, to the best of my knowledge that all significant deficiencies have been corrected by the agreed upon date and that the corrective action meet the requirements pursuant to IDAPA 58.01.08.

Signature: _____ **Date:** _____

Deficiencies

Distribution:

#6: There are still some fire hydrants that are served by mains less than 6" in diameter.

*Note: **No action is required at this time**, however as these main lines are replaced they must be evaluated for increasing in size to at least 6".*

Pumping:

#10: Auxiliary power is not provided that will enable the plant to continue to operate during a power failure.

*Note: **No action is required at this time**. It was indicated that power outages are of minimal frequency and duration so auxiliary power is not required, but will be re-evaluated during each inspection.*

Managerial:

#24: The system does not have a written total coliform sample site plan.

Note: Currently the operators appear to have a reasonable approach to sampling for total coliform, but it must be documented. Please submit a total coliform sample site plan showing at least four locations where samples will be alternately collected, and are representative of the system water being served.

Recommendations

Distribution:

#8: DEQ recommends a leak detection program be put in place and utilized.

#10: DEQ recommends a water conservation program be put in place and utilized.

#18: DEQ recommends all operators obtain training in cross connection control.

Financial:

#15: DEQ recommends the system produce and utilize a capital improvements pland.

This system will be in substantial compliance with regulations if the significant deficiencies of this survey are corrected. Thank you for your time and cooperation in the completion of this survey. If you have any questions, please contact me at (208) 373-0568 or via e-mail at brandon.lowder@deq.idaho.gov.

Sincerely,

Brandon Lowder
Drinking Water Analyst
Idaho Department of Environmental Quality

Enclosures: Enhanced Sanitary Survey Report
Enhanced Sanitary Survey Inspection Form

State of Idaho Public Water System Enhanced Sanitary Survey

WATER SYSTEM INVENTORY INFORMATION

SURVEY DATE	PWS #
5/17/2011 (mm/dd/yyyy)	4200022

Name of Public Water System: **Glenns Ferry, City of**		# of Groundwater Sources: 1	# of Storage Facilities: 1
		#of Surface Water Sources: 1	Total Storage (gal) : 500,000
Date of Last Survey: 10/19/2004	Health District: ☑ N/A	DEQ Region: ☐ N/A BRO	County: Elmore
Number of Service Connections: 647	Residential Population: 1611	Status: ☑ Approved ☐ Disapproved	Water Purchased From: ☑ N/A PWS #: Name:
			Water Sold To: ☑ N/A PWS #: Name:

Owner Type: Local Gov't	Legal Entity: Gov't Agency	Water System Classification: ☑ Community Water System ☐ Nontransient Noncommunity ☐ Transient Noncommunity - NC	Combined Sources? ☑ Yes ☐ No If yes, ☐ Well Field ☑ Manifold/Spring Box Sources Combined: River & Infiltration Gallery	System Classification: Distribution: DWD1 Treatment: ☐ N/A DWT2	Seasonal Operation Dates: ☑ N/A Date Open: Date Closed:

Responsible Charge Operator (DO): ☐ No DO ☐ N/A - Identify Operator for GW-NC PWS ☑ Mr. ☐ Ms. Jeff Cook(Todd)		**Legal Owner's Name:** ☐ Mr. ☐ Ms. City of Glenns Ferry	
Properly Licensed? ☑ Yes ☐ No ☐ N/A-GW-NC	License Type: DWT2, DWD1 ☐ N/A	Mailing Address: P.O. Box 910	
Mailing Address: P.O. Box 910	License Number: DWT2-14784, DWD1-10382	City, State, Zip Code: Glenns Ferry, ID 83623	Telephone Day: Night: Fax:
City, State, Zip Code: Glenns Ferry, ID 83623	Telephone Day: 208-366-7418 Night: 208-599-3741	E-mail:	
E-mail:	Fax:		

Substitute Responsible Charge Operator (OP): ☐ No OP ☐ N/A for GW-NC PWS ☑ Mr. ☐ Ms. Michael Mitchell		Individuals present during inspection:	
Properly Licensed? ☑ Yes ☐ No ☐ N/A-GW-NC	License Type: DWT1 ☐ N/A	Name: Jeff Cook	Title: Operator
Mailing Address: P.O. Box 910	License Number: DWT1-15034	Name: Michael Mitchell	Title: Operator
		Name:	Title:
City, State, Zip Code: Glenns Ferry, ID 83623	Telephone Day: Night:	Physical location of the PWS (Township, Range, Section):	
E-mail:	Fax:		

Samples taken at the time of survey by inspector? ☐ Yes ☑ No	Survey performed by: Name: Brandon Lowder Title: Drinking Water Analyst Phone #: 208-373-0568	Agency: ☑ IDEQ ☐ Health Dept. ☐ Other:
If yes, what:		

yes	no	n/a	unk	note	General Information
☐	☐	☐	☐	☐	1. Have previously required Significant Deficiencies & Deficiencies been addressed?
☐	☑	☐	☐	☐	2. Have modifications been made to the PWS since the last ESS?
☐	☐	☑	☐	☐	3. If yes, are the modifications considered to be significant?
☐	☐	☑	☐	☐	4. If yes, were plans and specs submitted to and approved by DEQ?
☐	☑	☐	☐	☐	5. Are there any known issues or problems with equipment or operation of the PWS that could negatively effect the quality of the water produced? (*If yes, comment*)

Comments:

Key

Significant Deficiency
Deficiency
Recommendation

Sanitary Survey Index

Modules used:	#
☑ General Information	1
☑ Surface water Source	1
☑ Groundwater Source	1
☑ Storage	1
☑ Distribution	1
☑ Pumping	1
☑ Financial Capacity	1
☑ Managerial Capacity	1
☑ Treatment Application	1
☑ Disinfection	1
☐ Notes	0
☐ Photo Log	0
Total Modules	**10**

SURFACE WATER SOURCE

A separate sources form must be filled out for each groundwater source in the PWS.

SURVEY DATE	PWS #
5/17/2011	4200022

Tag #:	Common Name of Source:	Source:	Is this Source Treated?
E0006757TP	Surface/Gallery Treatment Plant	Snake River	Water Sold To: N/A
Physical Location:			Water Purchased From: N/A

Treatment Objectives:	Treatment Types: (Identify Train in Comments
Flocculation, Filtration, Disinfection	Ferric chloride, membrane filters, sodium hypochlorite

Average Daily Production (GPD):	Maximum Daily Production (GPD):
	1.08 MGD is max

Latitude (Decimal): 42.946128

Longitude (Decimal): -115.299103

SURFACE WATER SOURCE

1. This source is:
   - [x] Active
   - [ ] Proposed
   - [ ] Inactive
   - [ ] Emergency (<60 days per year)

yes	no	n/a	unk	note	
☐	☑	☐	☐	☐	2. Has there been a Source Water Assessment conducted for the source? Date:
☐	☑	☐	☐	☐	3. Has a source water protection plan been developed for this source? Date:
☑	☐	☐	☐	☐	4. Is the source protected from unauthorized personnell?
☑	☐	☐	☐	☐	5. Is the intake screend to prevent entry of debris?
☑	☐	☐	☐	☐	6. Are screens maintained?
☑	☐	☐	☐	☐	7. Does water treatment meet turbidity standards during any increased turbidity events?
☐	☑	☐	☐	☐	8. Is intake inspected frequently? Date of last inspection _____
☑	☐	☐	☐	☐	9. Is a raw water sampling tap provided?
☑	☐	☐	☐	☐	10. Does system use continuous turbidity monitoring?
☑	☐	☐	☐	☐	11. If yes, is the turbiditmeter operated, maintained, standardized and calibrated according to manufacturer's recommendations?
☐	☐	☑	☐	☐	12. Are the clarification units designed to allow units to be taken out of service without disrupting opeartion?
☐	☑	☐	☐	☑	13. Does the sedimentation process involve the addition of a coagulation chemical?
☐	☐	☐	☐	☐	14. If yes, what is the coagulation chemical used? ___Ferric chloride_____
☐	☐	☐	☐	☐	15. Are the basins equipped with a mechanical mixing device?
☐	☐	☐	☐	☐	16. Are the rapid mix and flocculation basin as close together as possible?
☑	☐	☐	☐	☐	17. Do the flocculation & sedimentation inlet and outlet prevent short-circuiting and destruction of floc?
☑	☐	☐	☐	☐	18. Are there at least 2 filter units provided?
☑	☐	☐	☐	☐	19. Are the filter units capable of meeting the plant capacity at the approved filtration rate with one filter removed from service?
☑	☐	☐	☐	☐	20. Is there a sample tap for raw and filtered water for every filter?
☐	☐	☑	☐	☐	21. SLOW SAND -- Does the filter have headroom to permit normal movement by operating personnel for scraping and sand removal operation?
☐	☐	☑	☐	☐	22. SLOW SAND -- Does the filter have an overflow at the maximum filter water level?
☑	☐	☐	☐	☐	23. Is the CT calculation based on a full contact basin?
☑	☐	☐	☐	☐	24. If yes, is the contact basin full at the time of the survey?
☐	☐	☐	☐	☑	25. What model of turbidimeter is being used? (Hach 1720D?) __Hach 1720D_____
☐	☑	☐	☐	☐	26. Is the discharge to waste line from the turbidimeter equipped with an air gap?

COMMENTS:
(Please indicate question number)

Utilize blower to air scour screens

Do not use sedimentation basins

A separate sources form must be filled out for each groundwater source in the PWS.			5/17/2011		4200022
Tag #:		Common Name of Source:	Source:		
E0006757TP		Surface/Gallery Treatment Plant			

System Narrative:

1.Describe the source water and intake structure:

Name and type of source: Snake river

Where is intake located in that source (distance from shore, depth): About 100-150' from bank, sits about 1 foot from bottom All four intakes out there in a staggered configuration. Use a US Filter 4 - 16th inch screens. Model # Rex Style, Order # 31142-01. Runs through 800um filter after roughing screens

Pump info (Hp of pump, make, model): Two US Motor turbine pumps feed to plant. Both 20 Hp, model numbers are unknown.

About source water quality, seasonality, turbidity fluctuations: Raw has climbed as high as >10 NTU in spring, but drops pretty quickly, blended with infiltration gallery so they can increase gallery usage to drop turbidity down when needed.

2. Describe filtration process from beginning to end

Type/brand etc. of filter: Water Comes in, combines in wet well then can go through PAC treatment, but PAC typically isnt used. It then splits into two trains, heads to floc & filtration. Goes through Zenon 500-C membrane filters. Water pulled through membranes by two Busch Mink MM pumps. Finished water (pre-Cl) is pushed to contact tank by two pumps. Can be assigned to either train

What type of disinfectant added, where is it added, how? Sodium hypochlorite is generated onsite with a ClorTec generation system to produce 0.8 mg/L solution. It is fed into the water after filtration before entering the contact basin.

How often is the plant backwashed, how long filtered to waste? Is there backflow prevention (potable/backwash): Intakes backwashed rarely, not really needed. An 800 um filter is routinely backwashed. The potable line feeding the backwash is only protected by a double check valve, and the discharge is located in a trough and is not equipped with an air gap, although an air gap is provided on the discharge of the trough.

About turbidimeter, where placed etc. System uses two Hach 1720-D turbidimeters to measure the raw water, and two Hach 1720-D turbidimeters to measure the treated water. ChemTrac particle counters (Model # PC 2400 D) are also utilized.

How is the flow controlled? System calls for water & ramps up pumps through SCADA as needed

How is pH and free chlorine measured?

How does the plant achieve adequate CT? Water is pushed to a chlorine contact basin that is well baffled and equipped with weirs to ensure adequate contact time.

Any storage? Where, how much etc.? The chlorine contact basin shouldn't really be counted as storage since the weir prevents the basin to be drawn down much at all. The only storage provided is a single 500,000 gallon storage tank located on the other side of town.

GROUNDWATER SOURCE - PG.1

A separate sources form must be filled out for **each** groundwater source in the PWS.

SURVEY DATE: 5/17/2011 (mm/dd/yyyy)

PWS #: 4200022

Tag #: E0006757	Common Name of Source: Infiltration Gallery	Source: ☐ Well → ☐ Manifold; ☐ Spring → ☐ Spring Box	Is this Source Treated? ☑ Yes ☐ No
Physical Location:			Treatment Objective: ☐ N/A
			Flocculation, Filtration, Disinfection
			Treatment Types: ☐ N/A (Identify Treatment Train in Comments)
Is there a well log for the groundwater source? ☐ Yes ☐ No ☑ N/A ☐ Unk			Ferric chloride, membrane filters, sodium hypochlorite

Pump Capacity (GPM)	Casing Size (In)	Date Drilled:	Well Depth (Ft)	Casing Depth (Ft)	Grout Depth(Ft)	Static Water Depth (Ft)
☐ Unk	☐ Unk	☐ Unk	☐ Unk	☐ Unk	☐ Unk	☐ Unk

Is the Casing Screened?	Screen Depth (Ft): ☐ N/A ☐ Unk	Is the Casing Perforated?	Perforation Depth (Ft): ☐ N/A ☐ Unk
☐ Yes ☐ No ☐ Unk ☐ N/A	From: To:	☐ Yes ☐ No ☐ Unk ☐ N/A	From: To:

Latitude (Decimal): 42.946128

Longitude (Decimal): -115.299103

All Sources

1. This source is: ☑ Active ☐ Proposed ☐ Inactive ☐ Emergency (<60 days per year)

yes	no	n/a	unk	note	
☑	☐	☐	☐	☐	2. Has there been a Source Water Assessment conducted for the source? Date: 4/24/2002
☑	☐	☐	☐	☐	3. Has a final GWUDI determination been done for this source? Date: 8/16/2002

☐ N/A 4-36 if source is a spring

WELL INFORMATION

yes	no	n/a	unk	note	
☑	☐		☐	☐	4. Is the well on a separate lot that is large enough to provide a minimum distance of 50 feet between the well and the nearest property line? (applicable if constructed after 11/1/77)
☐ Significant	☐ Deficiency				

Are the following minimum distances from the PWS well being met?

☑	☐		☐	☐	5. - Gravity sewer line.....50 Ft.
☑	☐		☐	☐	6. - Pressure sewer line.....100 Ft.
☑	☐		☐	☐	7. - Individual home septic tank.....100 Ft.
☑	☐		☐	☐	8. - Individual home disposal field.....100 Ft.
☑	☐		☐	☐	9. - Individual home seepage pit.....100 Ft.
☑	☐		☐	☐	10. - Privies.....100 Ft.
☑	☐		☐	☐	11. - Livestock.....50 Ft.
☑	☐		☐	☐	12. - Canals, streams, ditches, lakes, ponds and tanks used to store nonpotable substances.....50 Ft.
☐	☑		☐	☐	13. Are pesticides, herbicides, fertilizers, portable containers of petroleum products, or other toxic or hazardous materials stored on the well lot?
☐	☑		☐	☐	14. Are pesticides, herbicides, or fertilizers applied to the well lot?
☐	☐	☑	☐	☐	15. Is the well in a pit? If yes, Date constructed:
☐	☐	☑	☐	☐	16. Was the well that is located in a pit installed after 11/5/64?
☐	☐	☑	☐	☐	17. If pit was installed prior to 11/5/64 – Has DEQ granted an exception and does the pit have water tight construction of pit walls and floor, a floor drain and an acceptable pit cover?

yes	no	n/a	unk	note	
☑	☐	☐	☐	☐	18 Is the well protected from unauthorized entry? *(Recommended)*
☐	☐	☑	☐	☐	19. Does the casing extend a minimum of 18 inches above the final ground surface and/ or 12 inches above the pump house floor?
☐ Significant	☐ Deficiency				
☐	☐	☑	☐	☐	20. Is the well vented with the open end of the vent screened and terminated downward at least 18 inches above the final ground surface?
☐	☐	☑	☐	☐	21. Is the well provided with a sanitary cap that prevents surface water entry?
☐	☐	☑	☐	☐	22. Is the well cased and sealed in such a manner that surface water cannot enter the well?

COMMENTS:
(Please indicate question number)

This source manifolds with surface water intake and is treated at the plant

Common Name	SURVEY DATE		PWS #
Infiltration Gallery	5/17/2011	(mm/dd/yyyy)	4200022

COMMENTS:
(Please indicate question number)

WELL INFORMATION (cont.)

yes	no	n/a	unk	note	
☑	☐	☐	☐	☐	23. Is there a smooth nosed sample tap provided on the well discharge pipe prior to treatment? (Threaded tap is approved with backflow preventer)
☑	☐	☐	☐	☐	24. Is an instantaneous and totalizing flow meter equipped with nonvolatile memory installed on the pump distribution line of the well and is it maintained and working properly? ____ gallons ☐ Unnecessary
☑	☐	☐	☐	☐	25. Is a pressure gauge provided at all installations and is it maintained and working properly? ____ psi.
☐	☐	☑	☐	☐	26. Can the well be pumped to waste at the design capacity of the well via an approved air gap at a location prior to the first service connection?

PUMP HOUSE *(Any structure containing important water system components)*

yes	no	n/a	unk	note	
☑	☐	☐	☐	☐	27. Is the source located in a pump house?
☑	☐	☐	☐	☐	28. Is the pump house kept clean and in good repair? *(Floor cracks?)*
☑	☐	☐	☐	☐	29. Is the pump house protected from unauthorized personnel?
☑	☐	☐	☐	☐	30. Does the pump house have adequate lighting throughout? *(Recommended)*
☐	☐	☑	☐	☐	31. Are all non-sample taps installed in the pump house equipped with an appropriate backflow prevention device?
☑	☐	☐	☐	☐	32. Is adequate ventilation provided in the pump house for dissipation of excess heat and moisture from the equipment? ☐ Significant ☐ Deficiency
☑	☐	☐	☐	☐	33. Is adequate heating provided in the pump house to provided safe and efficient operation of equipment to prevent freezing? ☐ Significant ☐ Deficiency
☑	☐	☐	☐	☐	34. Is the pump house protected from flooding, have adequate drainage, is the floor surface at least six (6) inches above the final ground surface, and is the ground surface graded so as to lead surface water away from the pump house?
☐	☑	☐	☐	☐	35. Is the sump for pump house floor drains closer than 30 feet from the well?
☐	☑	☐	☐	☐	36. Is the floor drain connected to sewer, storm drains, chlorination room drains, or any other source of contamination?

SPRING INFORMATION

yes	no	n/a	unk	note	
☐	☐	☑	☐	☐	37. Is the entire area within a one hundred (100) foot radius of the spring box fenced to prevent trespassing of livestock and void of buildings, dwellings and sources of contamination?
☐	☐	☑	☐	☐	38. Is surface water diverted from the 100 foot protection zone around the spring?
☐	☐	☑	☐	☐	39. Is the spring housed in a permanent structure and protected from contamination including the entry of surface water, animals and dust?
☐	☐	☑	☐	☐	40. Is there a smooth nosed sample tap provided on the spring discharge pipe prior to treatment? (Threaded tap is approved with backflow preventer)
☐	☐	☑	☐	☐	41. Is a flow meter or other flow measuring device provided?

SPRING BOX INFORMATION *(Not all existing springs have a spring box)*

yes	no	n/a	unk	note	
☐	☐	☑	☐	☐	42. Is the spring box equipped with a screened overflow?
☐	☐	☑	☐	☐	43. Is the supply intake located above the floor of the collection chamber?
☐	☐	☑	☐	☐	44. Is the spring box protected from contamination including the entry of surface water, animals, and dust?
☐	☐	☑	☐	☐	45. Is the access port fitted with a solid water tight cover which overlaps a framed opening and extended down around the frame at least 2 inches?
☐	☐	☑	☐	☐	46. Is the access port a framed opening that is at least 4 inches high with a locking device?
☐	☐	☑	☐	☐	47. Is the access port elevated at least twenty-four (24) inches above the top of the box or ground level, whichever is higher?

STORAGE

A separate storage form must be filled out for **each** storage unit in the PWS.

SURVEY DATE: 5/17/2011 (mm/dd/yyyy) | PWS #: 4200022

Storage Structure Name: Total Storage Capacity	Storage Structure ID #: T4200022TS1	COMMENTS: (Please indicate question number)
Physical Location:	Date in service: ☐ Unk 2000	
	Volume (gal): ☐ Unk 500,000	

Storage Type:	Construction: ☐ Elevated	Type of material:
☑ Reservoir/Tank	☑ Above Ground	☐ Plastic ☐ Wood
☐ Standpipe	☐ Partially Below Ground	☐ Fiberglass ☑ Metal
	☐ Below Ground	☐ Concrete ☐ Naturally Contained

Total Days Supply (This structure):	Date Last:	Inspected: ☐ Unk	Cleaned: ☐ Unk
~1day ☐ Unk		2007	New in 2000

How is the water level measured? ☐ Unk
Transducer

yes	no	n/a	unk	note	ALL STORAGE STRUCTURES
☑	☐	☐	☐	☐	1. Is the storage structure safely accessible to the inspector?
☐	☑	☐	☐	☐	2. Is the PWS storage tank located within 500 feet of any municipal or Industrial wastewater treatment plant or any land which is spray irrigated with wastewater or used for sludge disposal?
☐	☑	☐	☐	☐	3. Are any of the storage structure drains directly connected to a sewer or storm drain?
☑	☐	☐	☐	☐	4. Is an overflow provided that discharges to daylight in a way that will preclude the possibility of backflow to the reservoir and, where practical, provided with an expanded metal screen installed within the pipe that will exclude rodents and deter vandalism?
☑	☐	☐	☐	☐	5. Are overflows brought down to an elevation between 12 and 24 inches above the ground surface? *(2X the diameter of the discharge pipe above a basin rim)*
☑	☐	☐	☐	☐	6. Do overflows discharge over a drainage inlet structure or splash plate?(storm or sanitary)
☑	☐	☐	☐	☐	7. Is the storage structure secure from unauthorized access?
☑	☐	☐	☐	☐	8. Does the storage reservoir have a watertight roof or cover and is it sloped to facilitate drainage?
☑	☐	☐	☐	☐	9. Is the storage water protected from contamination?
☑	☐	☐	☐	☐	10. Is the storage structure structurally sound?
☐	☑	☐	☐	☐	11. Could vegetation in the area potentially impact the storage structure?*(Recommended)*
☑	☐	☐	☐	☐	12. Is the storage structure designed so that it can be isolated from the distribution system without necessitating loss of pressure in the distribution system?
☐	☑	☐	☐	☐	13. Is leakage evident at time of inspection?
☐	☑	☐	☐	☐	14. Is the storage structure interior coating or liner peeling or cracked?
☑	☐	☐	☐	☐	15. Is the storage structure used to store finished water?
☑	☐	☐	☐	☐	16. Are access manhole openings for the storage structure 4 inches or greater above the surface of the roof, with a cover 2 inches overlapping, water tight, hinged and locked?
☑	☐	☐	☐	☐	17. Are all vents extended 12 inches above the roof and constructed to exclude potential sources of contamination? *(The overflow pipe shall not be considered a vent)*

yes	no	n/a	unk	note	ABOVE GROUND STORAGE
☑	☐	☐	☐	☐	18. Do all vents open downward and are they fitted with a 4 mesh non-corrodible screen?

yes	no	n/a	unk	note	GROUND-LEVEL, PARTIALLY BURIED, or BELOW-GROUND STORAGE
☐	☐	☑	☐	☐	19. Does the overflow for the storage structure have a vertical section of pipe at least 2 pipe diameters in length?
☐	☐	☑	☐	☐	20. Is the overflow for the storage structure provided with either a 24 mesh non-corrodible screen installed within the pipe when practical, or an expanded metal screen installed within the pipe plus a weighted flapper or check?
☐	☐	☑	☐	☐	21. Is the area surrounding the storage structure graded in a manner that will prevent surface water from standing within 50 feet of it?
☐	☐	☑	☐	☐	22. Are all vents for the storage structure open downward with the opening at least 24 inches above the roof or the ground level and covered with 24 mesh non-corrodible screen to exclude potential contamination?

yes	no	n/a	unk	note	PARTIALLY BURIED OR BELOW-GROUND STORAGE
☐	☐	☑	☐	☐	23. Are "ALL" manholes elevated 24 inches above the surface of the roof or the ground level, which ever is higher?
☐	☐	☑	☐	☐	24. Is there a minimum distance of 50 feet between the storage structure and any non-potable main, standing water, or other possible source of contamination?

DISTRIBUTION

One form for **all** distribution systems in the PWS.

SURVEY DATE: 5/17/2011 (mm/dd/yyyy)

PWS #: 4200022

What are water lines made of:

Material(s): ☐ Unk

☑ Steel ☐ HDPE (black) ☐ Asbestos/Cement

☑ PVC ☑ Ductile Iron ☐ Copper

☑ Other: **C900**

Size(s): ☐ Unk

4" - 12"

How many services are metered?

647 out of **647**

Number of Fire Hydrants:

85

COMMENTS:
(Please indicate the question number)

yes	no	n/a	unk	note	DISTRIBUTION
☐	☑	☐	☐	☐	1. Have there been any interruptions in service during the past year? (including pressure loss)
☐	☐	☑	☐	☐	2. If a loss of pressure occurred (>20 psi), did the PWS provide public notice and disinfect the system? *(Reminder)*
☑	☐	☐	☐	☐	3. Is the PWS able to maintain a minimum pressure of twenty (20) psi throughout the distribution system (including fire flow), or forty (40) psi for PWSs constructed after 7/1/1985 (excluding fire flow), during maximum hourly demand conditions?
☐	☑	☐	☐	☐	4. Was the pressure observed at a service connection?
					5. If yes: ____ psi. Location: ____ Time: ____ ☐ A.M. ☐ P.M.
☐	☑	☐	☐	☑	6. Do all water mains that provide fire flow have a diameter of at least 6 inches?
☑	☐	☐	☐	☐	7. Are valves exercised regularly? *(Recommended)* If yes, how often? **1x/yr**
☐	☑	☐	☐	☐	8. Is there a leak detection program? *(Recommended)*
☐	☐	☐	☑	☐	9. Is 15% or more of the water unaccounted for?
☐	☑	☐	☐	☐	10. Is a water conservation program in effect? *(Recommended)*
☑	☐	☐	☐	☐	11. Is an adequate map of the distribution system maintained? *(Recommended)*
☑	☐	☐	☐	☐	12. Does the system flush all main lines annually? *(Recommended)*
☑	☐	☐	☐	☐	13. Are all dead end water mains equipped with a means to flush?
☑	☐	☐	☐	☐	14. If yes, are the deadends flushed at least semiannually?
☐	☑	☐	☐	☐	15. Are there any distribution materials used that should not be in contact with the drinking water? *If yes, explain in comments section.*
☑	☐	☐	☐	☐	16. Is the system adequately protected from freezing?
☐	☑	☐	☐	☐	17. Is there a cross connection control program? *(Community PWSs Only)*
☐	☑	☐	☐	☐	18. Is the operator trained in cross connection control? *(Recommended)*
☐	☑	☐	☐	☐	19. Is the operator aware of any cross connections or were any cross connections observed during the course of the survey?
☐	☐	☑	☐	☐	20. If a separate non-potable irrigation system is provided for the consumer, are all mains, hydrants, and appurtenances easily identified as non-potable? (Purple Tape or other) *(Recommended)*

yes	no	n/a	unk	note	**Air/Vacuum Relief Valves** - *Placed at high points in water mains.*
☐	☐	☑	☐	☐	21. Are all automatic air relief valves equipped with a means of backflow protection?

PUMPING - PG. 1

One form for **all** Pumps.

SURVEY DATE		PWS #
5/17/2011	*(mm/dd/yyyy)*	4200022

PUMPS, PUMPHOUSES, AND CONTROLS						
Pump ID#:	Physical Location:	Type of Pump:	Brand:	Model:	Horsepower:	Purpose:
1	Infiltration Gallery	Turbine	Us Motors	Unknown	20	Pump to plant
2	Infiltration Gallery	Turbine	Us Motors	20030722-100	20	Pump to plant
3	SW Intake bldg	Turbine	Us Motors	Unknown	20	Pump to plant
4	SW Intake bldg	Turbine	Us Motors	Unknown	20	Pump to plant
5	Treatment permeate	Booster	Advantage plus (Westinghouse)	APHO1506TEA	15	Pump to clear well (contact time)
6	Treatment permeate	Booster	Advantage plus (Westinghouse)	APHO1506TEA	15	Pump to clear well (contact time)
7	Treatment permeate	Booster	Advantage plus (Westinghouse)	APHO1506TEA	15	Pump to clear well (contact time)
8	Treatment finished	Turbine	US Motors	6213-JC3	60	Dump to system
9	Treatment finished	Turbine	US Motors	6213-JC3	60	Dump to system

COMMENTS:
(Please indicate the question number)

ALL PUMPS

yes	no	n/a	unk	note	
☐	☐	☐	☐	☐	1. Are all pumps capable of providing the maximum pumping demand of the system?
☐	☑	☐	☐	☐	2. Does the pump(s) cycle excessively? *(Recommended)*
☑	☐	☐	☐	☐	3. Are all pumps provided with readily available spare parts and tools?
☐	☐	☑	☐	☐	4. Is a water pressure relief valve installed where the pump is directly connected to the distribution system?
☑	☐	☐	☐	☐	5. Is a standard pressure gauge installed on the discharge line?

WELL PUMPS

yes	no	n/a	unk	note	
☐	☐	☑	☐	☐	6. Is there an accessible check valve installed in the discharge line of each well between the pump and the shut-off valve?
☐	☐	☑	☐	☐	7. If the system has a vertical turbine motor driven pump(s), is an air release-vacuum relief valve located upstream from the check valve, with exhaust/relief piping terminating in a down-turned position at least 18 inches above the floor and covered with a 24 mesh corrosion resistant screen?
☐	☐	☑	☐	☐	8. If the pump(s) is "oil lubricated", is the oil NSF approved and suitable for human consumption?

WATER PUMPS *(not well pumps)*

yes	no	n/a	unk	note	
☑	☐	☐	☐	☐	9. Is an accessible check valve on the discharge side between the pump and the shut-off valve?

AUXILIARY POWER

yes	no	n/a	unk	note	
☐	☑	☐	☐	☐	10. Is there auxiliary power on-site? (Community Systems Only)
☐ Significant	☑ Deficiency				
☐	☐	☑	☐	☐	11. Is auxiliary power tested? *(Recommended)*
☐	☐	☑	☐	☐	12. If a diesel or gasoline fueled engine is used on the well lot; is the fuel tank and connecting piping double walled?
☐	☐	☑	☐	☐	13. Is the fuel tank above ground?
☐	☐	☑	☐	☐	14. Is a certified operator present during the filling of the fuel tank?
					If the engine is in the well house
☐	☐	☑	☐	☐	15. Is the engine exhaust directly discharged outside the well house?
☐	☐	☑	☐	☐	16. Is a spill containment structure surrounding all fuel tanks adequate? *(Secondary containment - 110% fuel tank volume)*
					Community Systems Only
☐	☐	☑	☐	☐	17. (*Community Systems built after 4/15/07 only*) Is on-site power or standby storage provided so water can be treated and supplied to pressurize the entire distribution system during a power outage for a minimum of 8 hours?
☐	☐	☑	☐	☐	18. (*Community Systems built after 4/15/07 only*) If standby power is provided, Is there a minimum of 8 hours of fuel stored and located on site?

SURVEY DATE 5/17/2011 (mm/dd/yyyy) PWS # 4200022

COMMENTS:
(Please indicate the question number)

yes	no	n/a	unk	note	BOOSTER PUMPS
☐	☐	☑	☐	☐	19. Is an instantaneous and totalizing flow meter installed where the booster pump is directly connected to the distribution system? ☐ Unnecessary
☐	☐	☑	☐	☐	20. Are all in-line booster pumps supplied with an automatic cutoff that activates when intake pressure is less than or equal to 5 psi?
☐	☐	☑	☐	☐	21. Is the booster pump located on a suction line that is directly connected to any storage reservoir?
☐	☐	☑	☐	☐	22. If yes, are all booster pumps protected by an automatic cutoff to prevent pump damage and avoid excessive reservoir drawdown?

yes	no	n/a	unk	note	PUMP HOUSE *(Only pump houses that don't contain a Groundwater Source)*
☐	☐	☑	☐	☐	23. Is the pump house kept clean and in good repair? *(Floor cracks?)*
☐	☐	☑	☐	☐	24. Is the pump house protected from unauthorized personnel?
☐	☐	☑	☐	☐	25. Does the pump house have adequate lighting throughout? *(Recommended)*
☐	☐	☑	☐	☐	26. Are all non-sample taps installed in the pump house equipped with an appropriate backflow prevention device?
☐	☐	☑	☐	☐	27. Is adequate ventilation provided in the pump house for dissipation of excess heat and moisture from the equipment? ☐ Significant ☐ Deficiency
☐	☐	☑	☐	☐	28. Is adequate heating provided in the pump house to provided safe and efficient operation of equipment *(prevent moisture buildup and/or freezing)*? ☐ Significant ☐ Deficiency
☐	☐	☑	☐	☐	29. Is the pump house protected from flooding, have adequate drainage, is the floor surface at least six (6) inches above the final ground surface, and is the ground surface graded so as to lead surface water away from the pump house?
☐	☐	☑	☐	☐	30. Is the sump for pump house floor drains closer than 30 feet from the well?
☐	☐	☑	☐	☐	31. Is the floor drain connected to sewer, storm drains, chlorination room drains, or any other source of contamination?

FINANCIAL CAPACITY

SURVEY DATE: 5/17/2011 (mm/dd/yyyy)

PWS #: 4200022

yes	no	n/a	unk	note	FINANCIAL CAPACITY
☑	☐	☐	☐	☐	1. Is the PWS current with the payment of drinking water fees?
☑	☐	☐	☐	☐	2. Does the PWS charge a drinking water fee to the user? If yes, what is the fee: $ **24.61 base, 1.55/1,**
☑	☐	☐	☐	☐	3. Is the PWS in the business of selling water?
					#3 Note: → **- If no, identify why in the comments section and mark "N/A" on questions 4 - 19.**
☑	☐	☐	☐	☐	4. Does the PWS provide and use an annual budget? *(Recommended)*
☑	☐	☐	☐	☐	5. If applicable, is the PWS fund separate from the waste water/sewer utility fund? *(Recommended)*
☑	☐	☐	☐	☐	6. Do water system revenues exceed expenditures? *(Recommended)*
☑	☐	☐	☐	☐	7. Are controls established to prevent expenditures from exceeding revenues?
☑	☐	☐	☐	☐	8. Has an independent financial audit been completed? *(Recommended)*
☑	☐	☐	☐	☐	9. If yes, is a copy of the most recent balance sheet for the water system available? *(Recommended)*
☑	☐	☐	☐	☐	10. Does the water system include a cash budget within its annual budget for cash flow? *(Recommended)*
☑	☐	☐	☐	☐	11. Does the water system management review the user fee, user charge, or rate system at least annually? *(Recommended)*
					12. When was the last user fee, user charge, or rate system adjustment? **2004** *mm/dd/yyyy*
yes	no	n/a	unk	note	
☑	☐	☐	☐	☐	13. Does the water system management review financial reports at least monthly? *(Recommended)*
☑	☐	☐	☐	☐	14. Does the PWS provide and use a capital budget? *(Recommended)*
☐	☑	☐	☐	☐	15. Has this PWS produced and does it currently utilize a capital improvements plan? *(Recommended)*
					16. If yes, when was the capital improvements budget produced? ____ *mm/dd/yyyy*
☐	☐	☑	☐	☐	17. Has the capital improvement budget been updated in the last 18 months? *(Recommended)*
☑	☐	☐	☐	☐	18. Does the water system budget provide funding for depreciation of existing plant in service and/or for the funding of reserves for system replacement?
☑	☐	☐	☐	☐	19. Are there sufficient funds for training personnel?

COMMENTS:
(Please indicate the question number)

7, increase fees, trying to do 3% annual
8. Auditor from Twin Falls

MANAGERIAL CAPACITY

SURVEY DATE: 05/17/2011 (mm/dd/yyyy)

PWS #: 4200022

yes	no	n/a	unk	note	MANAGERIAL CAPACITY
☑	☐	☐	☐	☐	1. Is a properly licensed operator available at all times? (N/A for GW-NC PWS)
☐	☑	☐	☐	☐	2. Is there a Drinking Water Source Protection Plan developed for this system? Date:
☑	☐	☐	☐	☐	3. Does this PWS have a governing body or board of directors?

If no, please indicate:

- ☐ Sole Proprietorship
- ☐ Partnership
- ☐ Limited Liability Corp.
- ☑ Other: **City Council**

4. How often does the board meet? ☐ N/A

☐ weekly ☐ semi-annually ☐ never
☐ monthly ☐ annually ☐ unknown
☐ bimonthly ☐ as necessary ☐ other: **twice monthly**

yes	no	n/a	unk	note	Are the following records maintained onsite or located near by?
☑	☐	☐	☐	☐	5. - Bacteriological Analysis - **5 years retention.**
☑	☐	☐	☐	☐	6. - Chemical Analysis - **10 years retention.**
☑	☐	☐	☐	☐	7. - Records of actions taken to correct violations - **3 years retention.**
☑	☐	☐	☐	☐	8. - Copies of reports, summaries or communication related to sanitary surveys - **10 years retention.**
☑	☐	☐	☐	☐	9. - Reports concerning variances or exemptions - **5 years retention.**
☑	☐	☐	☐	☐	10. - Copies of public notices issued - **3 years retention.**
☑	☐	☐	☐	☐	11. - Daily free chlorine residuals *(required disinfection)* - **1 year retention.**
☑	☐	☐	☐	☐	12. Are routine maintenance schedules established? *(Recommended)*
☑	☐	☐	☐	☐	13. Is an operation and maintenance manual(s) provided for the PWS and does it include; daily operating instructions, operator safety procedures, location of valves and other key system features, parts list and parts order form, and information for contacting the water system operator?
☑	☐	☐	☐	☐	14. Is there a clear plan of organization and control among the people responsible for management and operations of the water system? *(Recommended)*

yes	no	n/a	unk	note	Are any samples of the following parameters past due?
☐	☑	☐	☐	☐	15. Coliform
☐	☑	☐	☐	☐	16. Nitrates
☐	☑	☐	☐	☐	17. Nitrites
☐	☑	☐	☐	☐	18. Lead and Copper
☐	☑	☐	☐	☐	19. IOCs
☐	☑	☐	☐	☐	20. VOCs
☐	☑	☐	☐	☐	21. SOCs
☐	☑	☐	☐	☐	22. Disinfection Byproducts
☐	☑	☐	☐	☐	23. Radionuclide
☐	☑	☐	☐	☐	24. Is a written total coliform rule (TCR) sample site plan available for review?
☐	☐	☑	☐	☐	25. Does the (TCR) sample site plan meet the minimum requirements?
☑	☐	☐	☐	☐	26. Does the system have a sufficient supply of approved sampling bottles properly stored? *(Recommended)*
☑	☐	☐	☐	☐	27. Does the PWS provide stairways, ladders and handrails where needed?
☑	☐	☐	☐	☐	28. Are treads of non-slip material provided where needed?
☐	☑	☐	☐	☐	29. Is a health concern produced from inadequately protected electrical wiring?
☑	☐	☐	☐	☐	30. Are all confined space entry requirements considered? *(Recommended)*
☐	☑	☐	☐	☐	31. Are there any unused subsurface water storage tanks that need to be abandoned?
☐	☑	☐	☐	☐	32. Are there any water supply wells that are no longer being used that need to be abandoned?

COMMENTS:
(Please indicate the question number)

TREATMENT APPLICATION & CONTROL

A separate form must be filled out for **each** Treatment Application in the PWS.

Survey Date		PWS #
5/17/2011	(mm/dd/yyyy)	4200022

Purpose of Treatment:	Treatment Facility Location:	Date Online: ☐ Unk	Treated Water (GPD): ☐ Unk
Surface Water Treatment	Treatment Plant		

Identify **one** process in the treatment train for inspection: ☐ N/A

☐ Sedimentation Basin ☐ Filtration ☐ Blending ☐ Oxidation ☐ Ion Exchange ☐ Aeration ☐ Reverse Osmosis ☐ Sequestration by Polyphosphates
☐ Detention Basin ☑ Chemical Coagulation ☐ Softening ☑ Disinfection (Complete Disinfection Mod.) ☐ Sequestration by Sodium Silicates

Sources Treated by Facility: (Tag #)	Equipment Manufacturer:	Model #:
Treatment Plant	Chlor Tec for disinfecton Watson Marlow	704u/ R
	BHS Ferric chloride -Watson Marlow Pump (2 pumps)	5040
	PAC Auger Feeders Ltd.	
	GE membrane filters	Zenon 500-C

Chemical Trade Name:	Chemical Manufacturer:	NSF/ANSI certified?
Sodium Chloride	Morton Solar Salt Natural	☑ Yes ☐ No ☐ N/A ☐ Unk
Ferric Chloride	BHS Ferric Chloride	☑ Yes ☐ No ☐ N/A ☐ Unk
Powder Activated Carbon	PAC - Acticarb	☑ Yes ☐ No ☐ N/A ☐ Unk

Comments:
(Please indicate the question number)
BHS ferric chloride is repackaged ferric chloride from PVS Technologies in Detroit

yes	no	n/a	unk	note	
					WASTE HANDLING and DISPOSAL
☐	☐	☑	☐	☐	1. Are provisions made for proper disposal of water treatment plant waste such as sanitary, laboratory, clarification sludge, softening sludge, iron sludge, filter backwash water, brines and treatment media?
		☑		☐	2. If yes, how are wastes being disposed of? (Identify in comments)
yes	no	n/a	unk	note	**SAMPLE TAPS**
☑	☐	☐	☐	☐	3. Are smooth-nosed sampling taps provided prior to and after each form of treatment?
		☐ N/A 4-23			**CHEMICAL APPLICATION** If no chemical applied, questions 4-23 are n/a
yes	no	n/a	unk	note	
☑	☐	☐	☐	☐	4. Are spare parts available for all chemical feeders to replace parts which are subject to frequent wear and damage?
		☐			5. Are the feeders manually or automatically controlled? ☐ Manual ☑ Automatic
☑	☐	☐	☐	☐	6. For chemical application control systems, is the chemical feeder controlled by a flow sensing device so that injection of the chemicals will not continue when the flow of water stops?
☑	☐	☐	☐	☐	7. Is a means to measure water flow provided in order to determine chemical feed rates?
☑	☐	☐	☐	☐	8. Are provisions made for measuring the quantities of chemicals used?
☑	☐	☐	☐	☐	9. Is cross-connection control provided on the service water lines that discharge to the solution tanks?
☑	☐	☐	☐	☐	10. Is cross-connection control provided so that liquid chemical solutions cannot be siphoned through solution feeders into the water supply?
☑	☐	☐	☐	☐	11. Is the chemical feed equipment readily accessible for servicing, repair, and observation of operation?
☑	☐	☐	☐	☐	12. Is space provided for convenient/efficient storage and handling of chemicals? *(Recommende*
☐	☑	☐	☐	☐	13. Are chemicals that are incompatible stored or handled together?
☑	☐	☐	☐	☐	14. Are chemical solution tanks kept covered?
☑	☐	☐	☐	☐	15. Are chemical solution tank overflow pipes, when provided, turned downward with the end screened? *(Recommended)*
☑	☐	☐	☐	☐	16. Do chemical solution tank overflow pipes, when provided, have free fall discharge? *(Recommended)*
☑	☐	☐	☐	☐	17. Where more than one (1) chemical is stored or handled, are tanks and pipelines clearly labeled to identify the chemical they contain?
☑	☐	☐	☐	☐	18. Are floor surfaces smooth and impervious, slip-proof and well drained? *(Recommended)*
☑	☐	☐	☐	☐	19. Are vents from feeders, storage facilities and equipment exhaust discharged to the outside atmosphere above grade and remote from air intakes?
☑	☐	☐	☐	☐	20. Are chemical shipping containers fully labeled to include chemical name, purity, concentration, supplier name and address, and evidence of ANSI/NSF certification?
☑	☐	☐	☐	☐	21. Are acids and caustics kept in closed corrosion-resistant shipping containers or storage units?
☑	☐	☐	☐	☐	22. Are at least one pair of rubber gloves, a dust respirator of a type certified by NIOSH for toxic dusts, an apron or other protective clothing and goggles or face mask provided for each operator as required by the reviewing authority?
☑	☐	☐	☐	☐	23. Is a deluge shower and/or eyewashing device installed where strong acids and alkalis are used or stored?

DISINFECTION - PG. 1 - Systems Using Only Groundwater

A separate form must be filled out for each disinfection unit in the PWS.

Survey Date	1/0/1900	PWS #
5/17/2011	(mm/dd/yyyy)	4200022

Treatment Facility Name:	Treatment Facility Location:	Date Online: ☐ Unk	Treated Water (GPD): ☐ Unk
Treatment Plant Disinfection	Treatment Plant		

Select all disinfection types used:

☐ Gas cl2 ☐ UV Light ☑ Sodium Hypochlorite ☐ Calcium Hypochlorite ☐ Miox ☐ Ozone ☐ Chlorine Dioxide ☐ Other

Comments:
(Please indicate the question number)

yes	no	n/a	unk	note	DISINFECTION
☐	☑	☐	☐	☐	1. Is disinfection used on a voluntary basis to prevent bacterial contamination of the distribution system?
☐	☑	☐	☐	☐	2. Any interruptions in disinfection in the past year? If yes, comment.
☐	☑	☐	☐	☐	3. Have any changes been made to this treatment facility since the last ESS?
☐	☐	☑	☐	☐	4. If yes, were plans and specs submitted to DEQ? Date approved:
☑	☐	☐	☐	☐	5. Does the system have a means of measuring the residual disinfectant concentrations of free chlorine, combined chlorine (chloramines), and/or chlorine dioxide?
☑	☐	☐	☐	☐	6. Is a smooth nosed sample tap provided before and after treatment?
☑	☐	☐	☐	☐	7. Is a chlorine residual being recorded when all compliance total coliform samples are being taken?

yes	no	n/a	unk	note	VOLUNTARY DISINFECTION
☐	☐	☑	☐	☐	8. Is a measurable free chlorine residual maintained throughout the distribution system? *(Recommended)*
☐	☐	☑	☐	☐	9. Is the free chlorine residual being measured daily? *(Recommended)*
☐	☐	☑	☐	☐	10. Is an automatic proportioning chlorinator being used where the rate of flow is not reasonably constant?
☐	☐	☑	☐	☐	11. Is the analysis for free chlorine residual being made at a frequency that is sufficient to detect variations in chlorine demand or changes in water flow?

yes	no	n/a	unk	note	REQUIRED DISINFECTION
☑	☐	☐	☐	☐	12. Is the free chlorine residual being measured daily at a location prior to the first service connection?
☑	☐	☐	☐	☐	13. Is the daily free chlorine residual being recorded and kept on file for a minimum of 1 year?
☑	☐	☐	☐	☐	14. Is a detectable chlorine residual maintained throughout the distribution system?
☑	☐	☐	☐	☐	15. Is an automatic proportioning chlorinator being used where the rate of flow is not reasonably constant?
☑	☐	☐	☐	☐	16. Where chlorination is required for protection of the supply, is there standby equipment of sufficient capacity available to replace the largest unit?
☐	☐	☑	☐	☐	17. If primary disinfection is accomplished using ozone or some other chemical that does not provide a residual disinfectant, is chlorine added to provide a residual disinfectant?

Treatment Facility Location:	Survey Date		PWS #
Treatment Plant	5/17/2011	(mm/dd/yyyy)	4200022

GAS DISINFECTION ONLY - Fill out any time Gas Chlorination is connected to the PWS.

Comments: (Please indicate the question number)

yes	no	n/a	unk	note	PROTECTIVE EQUIPMENT
☐	☐	☑	☐	☐	18. Is respiratory protection equipment, meeting the requirements of NIOSH available where chlorine gas is handled, and is it stored at a convenient location, but not inside any room where chlorine is used or stored?
☐	☐	☑	☐	☐	19. Does the respiratory protection equipment consist of compressed air, that has at least a 30 minute capacity, and is compatible with or exactly the same as units used by the fire department responsible for the plant?

yes	no	n/a	unk	note	CHLORINE LEAK DETECTION
☐	☐	☑	☐	☐	20. Is a bottle of ammonium hydroxide (56 percent ammonia solution) available for chlorine leak detection?
☐	☐	☑	☐	☐	21. Where ton containers are used, is a leak repair kit approved by the Chlorine Institute provided?
☐	☐	☑	☐	☐	22. Is chlorine gas leak detection equipment provided?
☐	☐	☑	☐	☐	23. Where a leak detector is provided, is it equipped with both an audible alarm and a warning light?

yes	no	n/a	unk	note	CHLORINE ROOM
☐	☐	☑	☐	☐	24. Is a separate room provided for gas chlorination equipment?
☐	☐	☑	☐	☐	25. Do pressurized chlorine feed lines carry chlorine gas beyond the chlorinator room?
☐	☐	☑	☐	☐	26. Is the chlorine room provided with a shatter resistant inspection window installed in an interior wall? ☐ Significant ☐ Deficiency
☐	☐	☑	☐	☐	27. Is the chlorine room constructed in such a manner that all openings between the chlorine room and the remainder of the plant are sealed?
☐	☐	☑	☐	☐	28. Are the chlorine room doors equipped with panic hardware, assuring ready means of exit and opening outward only to the building exterior?
☐	☐	☑	☐	☐	29. Where chlorine gas is used, does each room have a ventilating fan.
☐	☐	☑	☐	☐	30. Does the ventilating fan take suction near the floor and discharge away from any air inlets?
☐	☐	☑	☐	☐	31. Are all air inlets through louvers near the ceiling?
☐	☐	☑	☐	☐	32. Are there separate switches for the fan and lights located outside of the chlorine room and at the inspection window?
☐	☐	☑	☐	☐	33. Are outside switches protected from vandalism?

yes	no	n/a	unk	note	CHLORINE GAS CYLINDERS
☐	☐	☑	☐	☐	34. Are chlorinator rooms heated to 60 °F, and protected from excessive heat?
☐	☐	☑	☐	☐	35. Are full and empty cylinders of chlorine gas isolated from operating areas?
☐	☐	☑	☐	☐	36. Are full and empty cylinders of chlorine gas restrained in position to prevent upset?
☐	☐	☑	☐	☐	37. Are full and empty cylinders of chlorine gas stored in rooms separate from ammonia storage?
☐	☐	☑	☐	☐	38. Are full and empty cylinders of chlorine gas stored in areas that are not in the direct sunlight or exposed to excessive heat?
☐	☐	☑	☐	☐	39. Is a reasonably precise weight scale provided for weighing cylinders, at all plants utilizing chlorine gas?
☐	☐	☑	☐	☐	40. Is there an automatic switch-over of chlorine cylinders provided, where necessary, to assure continuous disinfection? *(Recommended)*

Appendix D

Consumer Confidence Report

City of Glenns Ferry's Drinking Water Report
2013 Sampling Results

We provide quality drinking water that meets all federal and state requirements.

During recent years we have sampled for many different chemicals and have found very little contamination. Contamination is anything other than pure water. We sample total coliform bacteria as an indicator of microorganisms (bacteria, viruses and other small creatures) that should not be present. The table below lists all the drinking water contaminants that we detected during the past calendar year or in our most recent tests as noted. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate a health risk. More information about contaminants and potential health effects can be obtained by calling 208-366-7418 or **U.S. Environmental Protection Agency's (EPA's) Safe Drinking Water Hotline (1-800-426-4791). EPA's website is www.epa.gov/safewater.**

Terms and abbreviations

Maximum Contaminant Level Goal (MCLG): the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Maximum Contaminant Level (MCL): the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

Action Level (AL): the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

na: not applicable **nd**: not detectable at testing limit **ppm**: parts per million or milligrams per liter

ppb: parts per billion or micrograms per liter **pCi/L**: picocuries per liter (a measure of radiation)

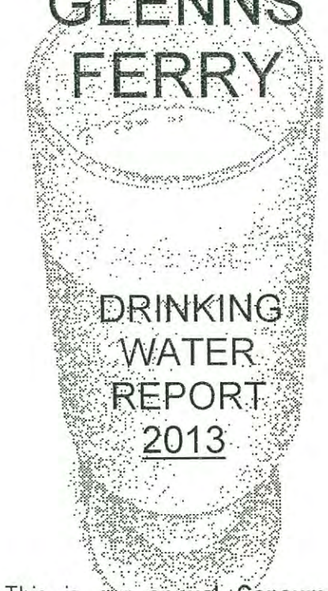
Regulated	MCLG	MCL	Our Water	Sample Date	Violation	Typical Source of Contaminant
Nitrate (ppm)	10	10	**4.9**	**10-8-13**	No	Runoff from fertilizer
Gross Alpha (pCi/L)	0	15	**3.3**	**9-26-12**	No	Naturally occurring
Radium-226 (pCi/L)	0	5	**1.4**	**9-26-12**	No	Naturally occurring
Uranium (pCi/L)	0	30	**3.6**	**9-26-12**	No	Naturally occurring
Lead (ppb)	0	15AL	**2**	**2012**	No	Corrosive water & home plumbing
Copper (ppm)	1.3	1.3AL	**0.027**	**2012**	No	Corrosive water & home plumbing
Fluoride (ppm)	4	4	**0.5**	**12-7-11**	No	Naturally occurring
Barium (ppm)	2	2	**0.02**	**12-7-11**	No	Naturally occurring
HAA5 (ppb)	na	60	**23**	**7-9-13**	No	Disinfection byproduct
TTHM (ppb)	0	80	**72.1**	**5-8-13**	No	Disinfection byproduct
Turbidity (NTU)	TT#	95%<1	100%<0.05 **0.48**	**5-14-13**	No	Soil runoff

Information on inside page

WE HAD NO VIOLATIONS!

CITY OF GLENNS FERRY
PO BOX 910
GLENNS FERRY, ID 83623

CITY OF GLENNS FERRY



This is our **annual Consumer Confidence Report (CCR)** on your drinking water system. The most recently required sampling results have been gathered to inform customers about their tap water. With this information, we hope you will learn more about your water and will help protect the water for future use.

Este informe contiene información muy importante sobre su agua beber. Tradúzcalo ó hable con alguien que lo entienda bien.

Sources of drinking water: both tap water and bottled water originate as "surface water" from rivers and lakes or as "ground water" from springs and wells. As water travels over the surface of land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material. Water picks up wastes from both human and animal activities. Surface water is usually filtered and disinfected to remove bacteria, viruses, and protozoa. Ground water is usually filtered naturally.

Contaminants that may be present include:

Microbial contaminants such as bacteria, viruses, and protozoa are very small living creatures that may be natural and harmless or harmful if originating from septic systems, agricultural livestock operations or wildlife.

Inorganic contaminants such as heavy metals can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges.

Pesticides and herbicides may come from agriculture and residential uses.

Radioactive contaminants are naturally occurring.

Organic chemical contaminants are usually man-made (synthetic) and vaporize easily (volatile). Petroleum products and degreasers are examples of gas station and dry cleaner waste transported by storm water and sewers.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by *Crypto sporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791).

EPA ensures that tap water is safe to drink by writing regulations that limits both natural and man made contaminants. We follow both state and federal regulations. Interstate bottled water is regulated by the U.S. Food and Drug Administration.

MONTHLY COUNCIL MEETINGS
2nd & 4th TUESDAY
7:00 p.m.....City Hall

Your drinking water comes from surface water called the Snake River. We are also utilizing our spring source at the river edge.

SOURCE WATER ASSESSMENT

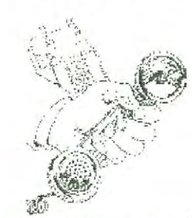
The State of Idaho has completed this assessment plan for our surface water which includes a map of where the water comes from, possible sources of contamination, and a review of the susceptibility of the source for contamination. The results are available in a report on file in our office.

INFORMATION
(refer to sampling results table)

#TT-Treatment Techniques is a required process intended to reduce the level of a contaminant in drinking water. Turbidity is a measurement of cloudiness of the water. We monitor it because it is a good indicator of the effectiveness of our filtration system.

HEALTH TIP

If present, elevated levels of **lead** can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Our system is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. **When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking.** If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods & steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or http://www.epa.gov/safewater/lead.



If you have any questions or in emergencies please call:
Jeff Cook
City Hall: 208-366-7418
Cell phone: 208-599-3741

Appendix E

Water Ordinance

ORDINANCE NO. 12-550

AN ORDINANCE OF THE CITY OF GLENNS FERRY, ELMORE COUNTY, IDAHO, AMENDING TITLE 10, CHAPTER 2, OF THE GLENNS FERRY CITY CODE RELATING TO WATERWORKS, BY RENUMBERING SEQUENTIALLY ALL SECTIONS OF CHAPTER 2; ADDING NEW SECTIONS 10-2-1 "PURPOSE", 10-2-13 "BASIS FOR AUTHORIZED WATER USER CHARGES", 10-2-14 "PURPOSE OF MONTHLY WATER USER CHARGES", 10-2-15 "APPLICATION FOR WATER SUPPLY", 10-2-17 "PAYMENT OF USER CHARGES; LATE FEE"; AND 10-2-18 "DISPUTED BILL; HARDSHIP"; DELETING SECTIONS 10-2-14 "HARDSHIP EXEMPTION," 10-2-19 "CHARGE FOR TURNING WATER OFF AND ON," AND 10-2-24 "CASH DEPOSIT"; AMENDING SECTION 10-2-1 (NEW 10-2-2) BY ADDING AND DELETING DEFINITIONS; AMENDING SECTION 10-2-2 (NEW 10-2-3) RELATING TO APPLICABILITY AND CITY AUTHORITY; AMENDING SECTION 10-2-4 (NEW 10-2-5) BY REQUIRING CONNECTION TO THE CITY WATER SYSTEM AND DISCONNECTION OF PRIVATE WATER SYSTEMS; AMENDING SECTION 10-2-7 (NEW 10-2-8) BY CLARIFYING THAT NEW SUBDIVISIONS SHALL PAY FOR COSTS OF WATER INSTALLATION AND MAKING TECHNICAL CORRECTIONS; AMENDING SECTION 10-2-8 (NEW 10-2-9) BY MAKING TECHNICAL CORRECTIONS; AMENDING SECTION 10-2-9 (NEW 10-2-10) BY CLARIFYING THAT NUISANCES SHALL BE ABATED AT THE EXPENSE OF THE PROPERTY OWNER AND MAKING TECHNICAL CORRECTIONS; AMENDING SECTION 10-2-10 (NEW 10-2-11) BY MAKING TECHNICAL CORRECTIONS; AMENDING SECTION 10-2-12 (NEW 10-2-16) RELATING TO WATER USER CHARGES; AMENDING SECTION 10-2-13 (NEW 10-2-19) BY DELETING REFERENCE TO A SPECIFIC RESOLUTION AND SPECIFYING THAT THE DISCONNECTED WATER RATE SHALL BE SET BY RESOLUTION OF THE CITY COUNCIL; AMENDING SECTION 10-2-15 (NEW 10-2-20) BY CHANGING THE DISCONNECT NOTIFICATION TIME REQUIREMENTS, MAKING TECHNICAL CORRECTIONS, DELETING REFERENCE TO A "COLLECTION VISIT", DELETING SUBSECTIONS "H", "L", "M" AND "O", AND REDESIGNATING REMAINING SUBSECTIONS; PROVIDING A SEVERABILITY CLAUSE; PROVIDING A CODIFICATION CLAUSE; PROVIDING A REPEALER CLAUSE; PROVIDING FOR PUBLICATION; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the City of Glenns Ferry, Idaho, is a municipal corporation organized and operating under the laws of the state of Idaho; and

WHEREAS, pursuant to Title 50, Chapter 3, Idaho Code, the City of Glenns Ferry has the authority to adopt, establish and amend its municipal code and set fees; and

WHEREAS, the City Council has determined that a comprehensive revision of the City's waterworks code is necessary to clarify and update definitions, billing procedures and other provisions related to the City's water system.

NOW, THEREFORE, BE IT ORDAINED BY THE MAYOR AND CITY COUNCIL OF THE CITY OF GLENNS FERRY, IDAHO, as follows:

12-550

Section 1: That Title 10, Chapter 2 of the Glenns Ferry City Code be and hereby is amended as follows:

Chapter 2

WATERWORKS

10-2-1: PURPOSE

10-2-~~1~~2: DEFINITIONS:

10-2-~~2~~3: APPLICABILITY:

10-2-~~3~~4: WATER SERVICE PROHIBITED IN FLOODPLAIN:

10-2-~~4~~5: ~~COMPLIANCE~~ USE OF CITY WATER REQUIRED:

10-2-~~5~~6: NONDOMESTIC IRRIGATION WATER:

10-2-~~6~~7: INSTALLATION OF IRRIGATION MAINS:

10-2-~~7~~8: INSTALLATION OF WATER METERS:

10-2-~~8~~9: INDUSTRIAL AND COMMERCIAL ~~WATER CONNECTIONS AND RATES~~CUSTOMERS:

10-2-~~9~~10: CROSS CONNECTIONS REQUIRED BY CERTAIN USERS:

10-2-~~9~~10-1: USE OF BACKFLOW PREVENTION DEVICES:

10-2-~~9~~10-2: CROSS CONNECTION INSPECTION:

10-2-~~9~~10-3: ADDITIONAL REMEDIES:

10-2-~~10~~11: SPECIFICATIONS:

10-2-1~~0~~1-1: EXTENSION COSTS:

10-2-1~~1~~2: PLACING OF TAPS:

10-2-1~~2~~3: ~~WATER RATES~~BASIS FOR AUTHORIZED WATER USER CHARGES:

10-2-1~~3~~4: ~~DISCONNECTED WATER RATE~~PURPOSE OF MONTHLY WATER USER CHARGES:

10-2-~~13-1~~15: ~~TEMPORARY DISCONTINUATION OF SERVICE~~APPLICATION FOR WATER SUPPLY:

10-2-1~~4~~6: ~~HARDSHIP EXEMPTION~~WATER USER CHARGES:

10-2-1~~5~~7: ~~DENIAL AND TERMINATION OF SERVICE, PAYMENT AGREEMENT RULES~~ PAYMENT OF USER CHARGES; LATE FEE:

10-2-1~~6~~8: ~~GARDENING SPRINKLERS REQUIRED~~DISPUTED BILL; HARDSHIP:

10-2-1~~7~~9: ~~IRRIGATION SCHEDULES~~TEMPORARY DISCONTINUATION OF SERVICE:

10-2-~~18~~20: ~~EMERGENCY RESTRICTIONS~~DENIAL AND TERMINATION OF SERVICE; PAYMENT AGREEMENT RULES:

10-2-~~19~~21: ~~CHARGE FOR TURNING WATER OFF AND ON~~GARDENING SPRINKLERS REQUIRED:

10-2-2~~0~~2: ~~ILLEGAL USE~~IRRIGATION SCHEDULES:

10-2-2~~1~~3: ~~INSPECTION~~EMERGENCY RESTRICTIONS:

10-2-2~~2~~4: ~~SEPARATE TAPS~~ILLEGAL USE:

10-2-2~~3~~5: ~~WATER FUND~~INSPECTION:

10-2-2~~4~~6: ~~CASH DEPOSIT~~SEPARATE TAPS:

10-2-2~~5~~7: ~~SUMMARY OF RULES~~WATER FUND:

10-2-2~~6~~8: ~~UNLAWFUL ACTS~~SUMMARY OF RULES:

10-2-2~~7~~9: ~~PENALTY~~UNLAWFUL ACTS:

10-2-30: PENALTY:

10-2-1 PURPOSE: It is hereby determined and declared to be necessary and conducive to and for the protection of the health, safety and welfare of the public and inhabitants of the city, and for the purpose of controlling the use and connection to, and for providing an equitable distribution of the costs and expenses of maintenance, operation, upkeep and repair of the entire municipal water system which includes the water supply, water storage and water distribution facilities of the city, to charge and collect service charges or fees upon all lots, lands, property and premises served or benefited by the municipal water system of the city, which system and facilities consist generally of all wells, storage reservoirs, transmission mains, structures, buildings, chlorination facilities, valves, service connections, service meters, fittings, mechanical equipment and all other facilities as required for the furnishing and distribution of water as a public system to the citizens of the city; and to provide for the control, use and administration of the installation of private domestic water systems where a public water system is not available.

10-2-~~1~~2: DEFINITIONS:

As used in this chapter, the following words and terms shall have the meanings ascribed to them in this section:

ADVANCE PAYMENT: A payment made prior to receiving service that will be credited to the customer's account at a later date.

~~APPLICANT: An applicant for residential, school, business, or industrial service.~~

AUTHORIZED WATER USER: Any person making authorized and proper use of the municipal water system and/or the water delivered thereby and who has made application for water service and such application has been granted and has paid for such service, water, and all fees required. An authorized water user may be an owner, his tenant, by lease or rental, a developer, etc.

CITY: Refers to the city of Glenns Ferry, Idaho, or its authorized or designated agent, representative or deputy thereto.

CITY WATER SERVICE LINE: That portion of any individual water service line that runs from its connection with the public water main to, and including, the corporation stop, valve box and meter that is installed in the service line. It will usually be installed within the limits of the public right of way or utility easement and, after approved installation, it is to be owned and maintained by the city.

~~CONNECTION: Any resident, business, school or industry that possesses a meter.~~

CUSTOMER: A person, public or private legal entity, the United States, the state of Idaho, the city of Glenns Ferry, Elmore County, or any governmental or other entity who uses, or is entitled to use, water service from the City. The City classifies customers as ~~R~~residential, school, business, or industrial ~~customers~~, unless further restricted by the rules of the public works department. The city will maintain on file a list of which customer classes of a given utility are residential, school, ~~business~~commercial, or industrial.

DEPOSIT: Any payment held as security for future payment or performance that is reimbursable.

MASTER WATER PLAN: Any document which the city of Glenns Ferry has accepted by official action of the city council which describes or otherwise indicates an overall view of proposed future water system needs, minimum water main sizing, and/or minimum water main spacing and routing.

MUNICIPAL WATER SYSTEM: Includes all components and facilities of the public water system that are owned, operated, or maintained by the city of Glenns Ferry, Idaho, for domestic and other uses.

OWNER: Refers to the property owner that is served by the municipal water system or desires to be served by the municipal water system.

PERSON: Any individual, firm, company, association, society, corporation or group.

PRIVATE WATER SERVICE LINE: The portion of the water service line that runs from the building being served to the point of connection with the water meter.

PRIVATE WATER SYSTEM: Any water system for domestic use that is not owned, operated and maintained by the city of Glenns Ferry, Idaho.

SPRINKLER IRRIGATION: Refers to any system for the purpose of watering lawns, gardens, shrubs, trees, etc., as they are normally grown in the out of doors or open spaces.

WATER MAIN: Any pipeline owned by the city for the purpose of transportation and/or distribution of water to serve more than one water service line or user.

~~RESIDENT: One or more rooms designed for, or used as a residence, not more than one family, including all necessary household employees of such family, and constituting a separate and independent housekeeping unit with a single kitchen permanently installed. The term does not imply or include such types of occupancy as a lodging or boarding house, club, sorority, fraternity, hotel/motel, single-family, or multiple-family~~. (Ord. 457, 5-12-1999)

10-2-~~2~~3: APPLICABILITY:

A. Application: The provisions of this chapter shall apply to all property within the corporate limits of the city, and any special users outside of the corporate limits of the city, including all property owned or occupied by the United States of America, the state of Idaho, and Elmore County.

B. City Authority: The water system for the supply of the city shall be under the sole and exclusive control of the mayor and council, who may, from time to time, direct the construction of such works, placing of mains, service pipes and fire hydrants, as the necessities of the city may require.

~~All existing and future city water service connections shall be subject to the provisions of this chapter.~~ (Ord. 457, 5-12-1999)

10-2-~~3~~4: WATER SERVICE PROHIBITED IN FLOODPLAIN:

City water service shall not be provided to any new structure located within the 100-year floodplain as identified on the most recent federal emergency management agency (FEMA) floodplain map. (Ord. 457, 5-12-1999)

10-2-~~4~~5: ~~COMPLIANCE~~ USE OF CITY WATER REQUIRED:

A. Connection To City System: The owner or occupant of any house, building or property used for residential, commercial, industrial, governmental or recreational use, or any other purpose, situated within the city which is abutting on or having a permanent right of access to any street, alley or right of way in which there is located a city water line is hereby required to cease using any other water system and at his expense to connect such building directly with the city water in accordance with the provisions of this chapter, within sixty (60) calendar days after the date of official notice from the city to do so.

B. Disconnection Of Private System Required: At such time as the municipal water system becomes available to the property served by the private water system, and the owner or tenant connects his property to municipal service as required, it is mandatory that the private water supply is not connected or cross connected in any way to the water lines served by the city water system. The disconnection of the private water supply line shall be inspected and approved by the public works director or his designated representative.

C. All persons and companies within the corporate limits of the city of Glenns Ferry may obtain city domestic and irrigation water service from the city waterworks, if available, by complying with the provisions of this chapter. (Ord. 525, 7-24-2007)

10-2-~~5~~6: NONDOMESTIC IRRIGATION WATER:

A. Use Prohibited: Use of domestic water for irrigation purposes shall be prohibited if alternate irrigation watering systems are available. (Ord. 533, 7-8-2008)

B. Rates: Rates for nondomestic irrigation water will be set by resolution and adopted by a motion of the city council from season to season.

C. Payment Required Prior To Use: No irrigation water shall be delivered unless payment is received by April 1, and will become delinquent April 20.

D. Penalty Amount: A penalty amount as set by resolution will accrue as of five o'clock (5:00) P.M., April 20.

E. Pipe Size; Lots: A three-fourths inch (3/4") pipe shall be installed for one to three (3) lots, a one inch (1") pipe shall be installed for four (4) to six (6) lots, and the water tap size for six (6) or more lots shall be sized according to the area. Payment shall be made for any portion of a lot that is watered. (Ord. 457, 5-12-1999)

10-2-~~6~~7: INSTALLATION OF IRRIGATION MAINS:

Installation of irrigation mains by private parties will be done under the direction of the public works director. All line sizing in road rights of way and city utility easements shall be determined by the city. The city shall own and maintain the lines after installation to the property line. (Ord. 457, 5-12-1999)

10-2-~~7~~8: INSTALLATION OF WATER METERS:

A. Water Meter Required: No person, firm, corporation, partnership or association shall receive domestic water from the city water system unless the amount of water so received is measured by a meter approved by the city ~~water~~ public works department.

B. Installation Fee: The owner of said property, requesting new water service, shall pay the installation fee that is set by the city council before the city shall provide water to said property.

C. Meters Property Of City: All water meters installed and connected to the city water system shall become the property of the city.

D. New Subdivisions: All new subdivisions ~~may~~ shall be required to pay all costs associated with the installation of water services to said subdivision and provide all new services in compliance with Idaho public works construction standards. (Ord. 457, 5-12-1999)

10-2-~~8~~9: INDUSTRIAL AND COMMERCIAL WATER CONNECTIONS AND RATES:

All industrial and commercial water ~~connections and rates~~ customers shall be charged at the rate to be set by council resolution. Industrial and commercial customers shall be required to pay for all new water system improvements necessary to connect to the water system. (Ord. 457, 5-12-1999)

10-2-~~9~~10: CROSS CONNECTIONS REQUIRED BY CERTAIN USERS:

A. Backflow Prevention Device Required: No water service connection to any premises shall be installed or continued in use by the city unless the water supply is protected by backflow prevention devices as may be required by this section.

B. Cross Connection Endangering Water Quality:

1. Prohibited: The installation or maintenance of a cross connection which will endanger the water quality of the potable water supply of the city shall be unlawful and is prohibited.

2. Declared Nuisance: Any such cross connection now existing or hereafter installed is hereby declared to be a public nuisance and the same shall be abated at the expense of the property owner.

3. Control Or Elimination: The control or elimination of cross connections shall be in accordance with this section together with the latest editions of appropriate manuals of standard practice pertaining to the cross connection control approved by the state of Idaho. The city shall have the authority to establish requirements more stringent than state regulations if ~~he~~ it deems that the conditions so dictate. The city shall adopt rules and regulations as necessary to carry out the provisions of this section. (Ord. 457, 5-12-1999)

10-2-~~9~~10-1: USE OF BACKFLOW PREVENTION DEVICES:

A. Circumstances Requiring Installation Of Device: Backflow prevention devices shall be installed at the ties on the premises or the materials used in connection with service connection or within any premises where, in the judgment of the city and/or health officer, the nature and extent of the activities, or materials stored on the premises, would present an immediate and dangerous hazard to health and/or be deleterious to the quality of the water should a cross connection occur; even though such cross connection does exist at the time the backflow prevention devices shall be installed under circumstances including, but not limited to, the following:

1. Premises having an auxiliary water supply.

2. Premises having internal cross connections that are not correctable, or intricate plumbing arrangements which make it impractical to ascertain whether or not cross connections exist.

3. Premises where entry is restricted so that inspections for cross connections cannot be made with sufficient frequency or at sufficiently short notice to assure that cross connections do not exist.

4. Premises having a repeated history of cross connections being established or reestablished.

5. Premises on which any substance is handled under pressure so as to permit entry into the public water supply, or where a cross connection could reasonably be expected to occur. This shall include the handling of process waters and cooling waters.

6. Premises where materials of a toxic or hazardous nature are handled in such a way that if back siphonage should occur, a serious health hazard might result.

7. The following types of facilities will fall into one of the above categories where a backflow prevention device is required to protect the public water supply. A backflow prevention device shall be installed at these facilities.

a. Hospitals, mortuaries, clinics.

b. Laboratories.

c. Metal plating industries.

d. Sewage treatment plants.

e. Food or beverage processing plants.

f. Chemical plants using a water process.

g. Petroleum processing or storage plants.

h. Radioactive material processing plants or nuclear reactors.

i. Others specified by the state of Idaho.

8. Other premises, as specified by the city, where backflow prevention devices are required to protect the public water supply.

B. Type Of Device: The type of protective device required shall depend on the degree of hazard which exists.

1. Health Or System Hazard: An air gap separation or reduced pressure principle backflow prevention device shall be installed where the public water supply may be contaminated with sewage, industrial waste of a toxic nature, or other contaminant which could cause a health or system hazard.

2. Objectionable But Not Hazardous: In the case of a substance which may be objectionable but not hazardous to health, a double check valve assembly, air gap separation, or a reduced pressure principle backflow prevention device shall be installed.

C. Location: Backflow prevention devices required by this section shall be installed at the meter, at the property line of the premises when meters are not used, or at a location designated by the purveyor. The device shall be located so as to be readily accessible for maintenance and testing, and furthermore, where no part of the device will be submerged.

D. Installation: Backflow prevention devices required by this section shall be installed under the supervision of and with approval of the city.

E. Model; Cost: Any protective device required by this section shall be a model approved by the Idaho ~~d~~Department of ~~health and welfare, division of~~ ~~e~~Environmental ~~q~~Quality or the Central ~~d~~District ~~h~~Health ~~d~~Department. A double check valve assembly or a reduced pressure principle backflow prevention device will be approved if it has successfully passed performance tests of the state of Idaho or other testing laboratories satisfactory to the state of Idaho and the supervisor. These devices shall be furnished and installed by and at the expense of the customer.

F. Inspection; Testing; Maintenance: Backflow prevention devices installed pursuant to this section, except atmospheric vacuum breakers, shall be inspected and tested annually or more often if necessary. Inspections, tests and maintenance shall be at the customer's expense. Whenever the devices are found to be defective, they shall be repaired, overhauled or replaced at the customer's expense. Inspections, tests, repairs and records thereof shall be accomplished under the city's supervision by the certified testers, and copies of the test results shall be submitted to the city.

G. Underground Sprinkling Device: No underground sprinkling device will be installed without adequate backflow prevention devices at the point from which the water for irrigation is taken from the public water supply.

H. Failure To Comply: Failure of the customer to cooperate in the installation, maintenance, testing or inspection of backflow prevention devices required by this section shall be grounds for terminating water service to the premises, or, in the alternative, the installation of an air gap separation at the customer's expense. (Ord. 457, 5-12-1999)

10-2-~~9~~10-2: CROSS CONNECTION INSPECTION:

A. Inspection Required: No water shall be delivered to any structure hereafter built within the city or within areas served by city water until the same shall have been inspected by the city for possible cross connection and approved as being free of same.

B. Hazardous Facilities: Any construction for industrial or other purpose which is classified as a hazardous facility, or where it is reasonable to anticipate intermittent cross connections, or as determined by the supervisor, shall be protected by the installation of one or more backflow prevention devices at the point of service from the public water supply or at any other location designated by the city.

C. Periodic Inspections: Inspections shall be made periodically of all buildings, structures or improvements of any nature now receiving water through the city's system, for the purpose of ascertaining whether cross connections exist. Such inspections shall be made by the city. (Ord. 457, 5-12-1999)

10-2-~~9~~10-3: ADDITIONAL REMEDIES:

In the event an improper cross connection is not corrected within the time limit set by the supervisor, or, in the event the city is refused access to any property for the purpose of determining whether or not cross connections exist, delivery of water to the property shall cease

until the deficiency is corrected to the city's satisfaction. In addition, the city may effect the necessary repairs or modifications at the expense of the property owner and refuse delivery of water to the property until the cost thereof shall have been paid. (Ord. 457, 5-12-1999)

10-2-1~~0~~1: SPECIFICATIONS:

All taps made on said mains or laterals for supplying water to ~~applicants~~ customers hereunder shall be no less than one inch (1") pipe. All such connections to the city water mains shall be made by the city ~~water~~ public works department employees. Single-family dwelling units shall not have more than a one inch (1") water meter. (Ord. 457, 5-12-1999)

10-2-1~~0~~1-1: EXTENSION COSTS:

Costs for all proposed extensions of the city water mains to service undeveloped areas within the existing corporate limits or newly annexed areas shall be the responsibility of that property owner or said owner's agent. All extensions shall comply with existing policies, specifications, master plans, or requirements established by the city engineer. The plans for all extensions to the city water mains shall be prepared under the direction of and signed by a registered professional engineer as per the licensing requirements of the Idaho Code, and three (3) copies of the said plans shall be filed with the city. In approving a plan for extension to the city water mains, the city reserves the right to stipulate other requirements such as a special permit fee, rights of way limits, sequence of construction, time limits for having existing service disrupted, the filing of a financial guarantee and other similar measures as may be required to protect the public. No work shall commence on any such extension of the city water mains until the extension project has been approved by the city council and all applicable fees have been paid. (Ord. 516, 7-11-2006)

10-2-1~~1~~2: PLACING OF TAPS:

All taps and connections to the water mains or laterals shall be made at the direction of the city public works director. (Ord. 457, 5-12-1999)

10-2-13: BASIS FOR AUTHORIZED WATER USER CHARGES

A. System Established: There is hereby established a system of periodic service charges and fees for the authorized use of, and for service rendered by the municipal water system of the city, and which charges and fees shall be as near as possible, uniform as to the different users served by said municipal water system. The rates, charges and fees provided by this chapter are hereby levied and assessed against the authorized water user or owner, and his property, having any water service connection with the municipal water system of the city.

B. Property Subject To Charges: It is specifically enacted that all improved property in the city to which the municipal water system is available, but is not used by the owner or occupier of said parcel of land, is still subject to user charges under the provisions of this chapter to cover the cost of standby fire protection facilities and other benefits.

10-2-14: PURPOSE OF MONTHLY WATER USER CHARGE

The monthly water user charge is established to cover operation and maintenance costs of the system, and to provide a fund to pay for repairs and replacements of the system, increase

efficiencies, meet state of Idaho or federal requirements, or redemption of bonds that have been used to finance system improvements, all as a part of the city's responsibility to provide adequate domestic water service and facilities for the city. The monthly water user charge as described herein, or as amended, shall be effective immediately upon acceptance and passage of this chapter, or an amending ordinance, and monthly user charge billing under the rates described herein shall begin at the end of the first calendar month following acceptance of this chapter. For new connections, the water user charge is to begin when the connection to the city service line has been inspected and approved or within sixty (60) days after the city service line has been installed, whichever is the earliest.

10-2-15: APPLICATION FOR WATER SUPPLY

A. Application Required: Whenever any person desires to obtain a supply of water from the city waterworks, he shall apply to the public works department for service and agree to be governed by such rules and regulations not inconsistent with this chapter, as may be prescribed by the mayor and city council for the control of the water supply.

B. Contents Of Application; Grant Of Application:

1. New Construction: The applicant must state the location, type of building, and uses therein, and fully and truly state the purpose for which the water is to be used, and shall furnish a set of floor plans showing all water uses and a site plan if the water is to be used for irrigation. If the application is granted, the public works department may authorize the extension, at the expense of the applicant, and at no expense to the city, the service pipe and meter tile, meter yoke, meter tile lid, curb stop and any other fittings that are necessary to install service to the inside line of the curb at the point most convenient for supplying the applicant.

2. Existing Water Service: In the case of an existing water service connection, if the real property or improvement is sold or otherwise transferred, the person entitled to possession shall make application to the municipal billing department to transfer the account, and shall supply the department with all information requested by the department.

3. Third Party Billing: After establishing an account for water service, a property owner may direct that a third party, such as a property management company, or a tenant, receive the billing for water, sewer, and solid waste collection services. The third party to whom the billings are sent shall also execute such documentation as is necessary to confirm the billing information. In the event such an account becomes delinquent, the municipal billing department shall send a delinquency notice to the billing recipient, and the owner, at the addresses contained in the agreements. The city will charge a third party billing account setup fee which must be paid at the time of the application. The fee will be set by resolution of the city council. The third party billing agreement shall also provide that the property owner remains primarily responsible for charges assessed to the account, and further, that all unpaid charges constitute a lien against the real property. An owner may appoint an agent, to act for the owner, to establish an account, receive billings, or do anything else an owner may do, or be required to do, pursuant to this code.

C. Street Paving: In cases where street paving is contemplated, the abutting property owners must either connect their premises with the water mains before the trench is backfilled or pay the cost of service from the main to curb if made thereafter.

10-2-1~~2~~6: WATER ~~RATES~~ USER CHARGES:

A. Set By Resolution Of Council: Every person, company or organization receiving water service from the city shall pay a minimum monthly water service charge, as shall be set from time to time by resolution of the city council. The monthly user fee shall be based on the amount of water used and the amount of fire and health protection provided by the municipal water supply system.

B. Deposits: Each new occupant desiring water service shall make application with the city clerk. Before such service shall be instituted, the applicant shall pay a deposit, established by resolution, which shall be refunded to the depositor by the city clerk after one year of good credit history, or at the time such service is discontinued, less any amount owing to the city by such person.

~~B. Due Date; Late Fee: Such charges shall be due and payable on the first day of each month and shall be considered late after the twentieth day of the same month, at which time a late fee, or such other fee, as may be set by resolution, shall be assessed.~~

C. Disconnection For Nonpayment; Charge For Returned Checks:

1. Notice: All fees for water sold, furnished, supplied or delivered by the city shall be due and payable upon presentation of the bill, and if not paid by the next billing cycle a disconnect notice will be sent by U.S. mail to the customer with the next month's billing.

2. Returned Check Charge: There will be a charge rendered for any dishonored or returned check received in payment on an account. The amount charged shall be established by resolution approved by the mayor and city council and shall include the actual costs for all checks which have been returned without payment, for any reason.

3. Disconnection For Noncompliance: The public works department shall disconnect, in accordance with the provisions of this section, the water system connection of any customer who has failed to comply with the provisions of this chapter. The public works department shall not disconnect the water system prior to forty eight (48) hours after the hand delivery of, or five (5) days after the mailing of the disconnect notice.

4. Additional Charges: The city treasurer may issue a disconnection notice for any delinquent bill, in accordance with the provisions of this chapter, and all services for a customer receiving such notice by mail or other delivery may be disconnected without further notice. After the issuance of a disconnection notice and at the time of disconnect, a disconnect charge in an amount established by resolution approved by the mayor and city council will be made and added to other amounts due from the customer. When service has been disconnected for nonpayment of bills, it shall not be reconnected to the same customer except upon payment of all prior billing for service at this account and all other accounts for this customer. If a customer turns on or causes to be turned on a

disconnected service, the public works department may again turn off the service using any means to ensure that service may not be reconnected by the customer or an agent of the customer and an additional disconnect charge may be assessed and/or the actual cost for disconnection including replacement costs for any damaged equipment, whichever amount is greater, in addition to other amounts due from the customer.

5. Reestablish Credit: On the failure of any customer to comply with the terms of this chapter regarding the payment of bills and where the deposit has been refunded, the city treasurer may require the customer to reestablish credit in the manner specified for original service.

~~C. Delinquent Notice: A delinquent notice will be mailed to those customers that are twenty one (21) days in arrears (i.e., have not paid within 21 days from the first of the month). Thereafter the customer has seven (7) calendar days to make payment or contact the city to set up a payment plan. The city shall disconnect service if, after seven (7) calendar days, a payment has not been received, nor a payment plan established.~~

~~D. Posting Of Payments: Payments made after three o'clock (3:00) P.M. will be posted to the next working day. (Ord. 457, 5-12-1999)~~

D. Liens: All delinquent charges or fees, as provided by this chapter, not paid after the final determination of the water user's account shall be imposed as a lien against and upon the property or premises against which such charge or fee is levied or assessed, and the city clerk shall certify such delinquencies together with all penalties to the tax collector of Elmore County, and, when so certified, the same shall be a lien upon the property and will be collectable as other taxes.

E. Reconnection Fee: Each time a public works department representative returns to a customer's premises to reconnect a service, an additional fee, established by resolution approved by the mayor and city council, shall be charged and collected from the customer before service is restored. When same day service restoration is requested, the service restoration fee shall be an additional fee as established by resolution.

F. Liability Of Landlord Or Owner: In the event that a premises is vacant or there is no responsible party on file with the city, the owner of such premises or landlord of such premises shall be liable to the city for the payment of any charges incurred. This includes all charges incurred between the time a tenant vacates the premises and the premises is reoccupied by a new tenant.

G. Interest Added On Delinquent Accounts: The city may apply interest to all delinquent accounts at a rate established by the law of the state of Idaho on money owed after the same becomes due.

10-2-1~~3~~7: PAYMENT OF USER CHARGES; LATE FEE:

All water charges shall be due and payable on the first day of each month and shall be considered late after the twentieth day of the same month, at which time a late fee, as may be set by resolution of the city council, shall be assessed.

10-2-14~~8~~: DISPUTED BILLS; HARDSHIP:

A. Protest: Water service will not be disconnected if, within forty eight (48) hours following the personal delivery of a disconnection notice, or within five (5) days of mailing of a disconnection notice, the customer submits a written protest of the disputed bill containing all facts and evidence necessary to review the protest. The city council shall have final and conclusive determination of these protests and shall provide this determination to the customer in writing. Should the protest be denied, water service shall be disconnected within forty eight (48) hours after the hand delivery of, or five (5) days after the mailing of the written determination by the city council regarding the protest of the disconnect notice.

B. Hardship: A customer who does not have the financial ability to pay the required fee may request temporary relief based upon financial hardship. The hardship request must be delivered to the city clerk within forty eight (48) hours following hand delivery or five (5) days following mailing of the disconnect notice. When a residential customer certifies, in writing, to the city council that payment by the ordinary due date creates a hardship due to the particular date when the customer receives funds, the due date may be extended up to an additional fifteen (15) days at the discretion of the city council.

10-2-1~~3~~9: DISCONNECTED WATER RATE:

A. ~~Initial Rates And Requirements: Resolution 98-5 establishes initial rates and requirements for disconnected water service and such rates may be changed by resolution.~~ The City Council will establish by resolution rates and requirements for disconnected water service and such rates may be changed by resolution.

B. Permanent Disconnection: For water service disconnected for more than sixty (60) consecutive days in any twelve (12) month period, water service will be permanently disconnected.

C. Future Connection: Future connection to the water system shall be at the then existing new connection fee and rates.

D. Notice Of Permanent Disconnection: Such permanent disconnection shall not occur until notice has been provided to the property owner and current resident by certified mail. Such notice shall be sent at least fourteen (14) days prior to disconnection during which time the owner or resident may reconnect to the water system if all accounts are current and all connection fees are paid. (Ord. 457, 5-12-1999)

10-2-1~~3~~9-1: TEMPORARY DISCONTINUATION OF SERVICE:

A. Requests may be made to temporarily discontinue water service for a period not to exceed twenty four (24) months. Upon request to discontinue water service an administrative fee, as set by resolution, will be assessed. The city shall assess, throughout the duration of the water revenue bond, a charge, set by resolution, ~~of ten dollars ($10.00)~~ for every month the water service is temporarily discontinued. Upon request to continue water service, any costs incurred necessary to provide full service shall be assessed together with an administrative charge, as set by resolution.

B. If a customer fails to pay the monthly bond payment and the payment has become sixty (60) days delinquent, or the twenty four (24) month limitation has been exceeded, a fourteen (14) day notice shall be issued allowing the customer to relinquish all rights concerning access to the city water system. If the appropriate forms are not completed and signed during the fourteen (14) day period, the city will remove the water meter and the customer will forfeit all rights pertaining to access to the water system. To regain said rights, the customer will pay the current reconnection fees. (Res. 02-03, 4-23-2002)

~~10-2-14: HARDSHIP EXEMPTION:~~

~~When a residential customer certifies, in writing, to the city that payment by the ordinary due date creates a hardship due to the particular date when the customer receives funds, the due date may be extended up to an additional fifteen (15) days at the discretion of the city. (Ord. 457, 5-12-1999)~~

10-2-~~15~~20: DENIAL AND TERMINATION OF SERVICE; PAYMENT AGREEMENT RULES:

A. Notice Required Prior To Termination: The city may deny or terminate service to a customer or applicant without the customer's or applicant's permission, but only after adequate notice has been given in accordance with these rules, for one or more of the following reasons:

1. The customer or applicant did not pay an undisputed delinquent bill or paid a delinquent bill with any check not honored by the bank.

2. The customer or applicant failed to make a security deposit, make an installment payment on a deposit, or obtain a guarantee, where it is required.

3. The customer or applicant failed to abide by the terms of a payment agreement.

4. The customer or applicant misrepresented the customer's or applicant's identity for the purpose of obtaining city service.

5. The customer or applicant denied or wilfully prevented the city's access to the meter.

6. The city determines as prescribed by relevant state, or other applicable standards that the customer is wilfully wasting service through improper equipment or otherwise.

7. The customer or applicant is using service for which the customer or applicant did not apply.Nothing in this rule requires the city to provide service to a customer who applies for city water and/or sewer who owes money on an existing or previous account.

B. Termination Without Prior Notice: The city may deny or terminate service without prior notice to the customer or applicant and without the customer's or applicant's permission for one or more of the following reasons:

1. A condition immediately dangerous or hazardous to life, physical safety, or property exists, or if necessary to prevent a violation of federal, state or local safety or health codes.

2. The city is ordered to terminate service by any court, city council, or any other duly authorized public authority.

3. The service is obtained, diverted or used without the authorization or knowledge of the city.

4. The city has tried diligently to meet the notice requirements, but has been unsuccessful in its attempts to contact the customer affected.

C. Requirements For Notice Prior To Termination:

1. ~~Seven~~ Five Day Notice: If the city intends to terminate service, with prior notice, the city shall send to the customer written notice of termination mailed at least ~~seven~~ five (~~7~~ 5) calendar days before the proposed date of termination. This written notice shall contain the information required by subsection D of this section.

2. Payment With Check Not Honored By Bank: The requirement of ~~seven~~ five days' written notice shall not apply when:

a. The customer does not make an initial payment according to a payment agreement or makes the initial payment with a check not honored by the bank.

b. The customer~~, at a city's collection visit to terminate service,~~ tenders payment with a check not honored by the bank and incurred bank service charges of fifteen dollars ($15.00) or such other fee as may be set by resolution.

c. In the event a customer attempts to tender payment with a check not honored by the customer's bank, the city shall assess an additional fifteen dollar ($15.00) service charge or such other fee as may be set by resolution, on that amount that is assessed by the bank, whichever is the greater.

D. Contents Of Notice Of Intent To Terminate Service: The written or oral notice of intent to terminate service required shall state:

1. The reason(s), citing these rules, why service will be terminated and the proposed date of termination;

2. Actions the customer may take to avoid termination of service;

3. A certificate notifying city of a serious illness or medical emergency in the household may delay termination as prescribed by subsection F of this section.

4. That the customer may request in writing to appear before the city council at the next regularly scheduled meeting concerning termination, and that service will not be terminated on the ground relating to the dispute between the customer and the city before the customer has had an opportunity to appear before the city council; and

5. The city may be willing to accept payment agreements. (This statement must be on written notices.)

E. Third Party Notification, Residential Service: The city shall provide a program for its residential customers known as third party notification. Under this program, the city will, at the request of the customer, notify orally or in writing a third party designated by the customer of the city's intention to terminate service. No customer can be considered to have refused to enter a payment agreement unless either the customer or the designated third party has been given notice of the proposed termination of service and of the customer's opportunity to make a payment agreement.

F. Serious Illness Or Medical Emergency:

1. Medical Certificate; Postponement Of Termination Of Service: The city shall postpone termination of utility service to a residential customer for thirty (30) days from the date of the receipt of a certificate by a licensed physician or public health official with medical training that states:

a. The customer, a member of the customer's family, or other permanent resident of the premises where the service is rendered is seriously ill, or has a medical emergency, or will become seriously ill, or have a medical emergency because of termination of service; and

b. Termination of utility service would adversely affect that customer, member of the customer's family, or resident of the household.

2. Contents Of Medical Certificate: This certificate must be in writing and show clearly the name of the person whose serious illness or medical emergency would be adversely affected by termination, the nature of the serious illness or medical emergency, and the name, title, and signature of the person giving notice of or certifying the serious illness or medical emergency.

3. Restoration Of Service: If service has already been terminated when the medical certificate is received, service shall be restored. The customer must receive service for thirty (30) days from the city's receipt of the certificate.

4. Payment Arrangements: Before the expiration of the medical postponement, the customer must make a payment agreement with the city in accordance with subsection ~~K~~J of this section.

5. Second Postponement: The city may postpone termination of service upon receipt of a second certificate stating that the serious illness or medical emergency still exists.

6. Verification Of Medical Certificate: The city may verify the authenticity of the certificate and may refuse to delay termination of service if it is determined that the certificate is a forgery or is otherwise fraudulent.

G. Medical Facilities; Shelter Care: Where service is provided to a customer known to the city to be or identifying itself as a medical care facility, including a hospital, medical clinic with resident patients, nursing home, intermediate care facility or shelter care facility, notice of pending termination shall be provided to the city council and to the state department of health and welfare as well as to the customer. Upon request from the city council, a delay in termination of no less than seven (7) calendar days from the date of notice shall be allowed so that action may be taken to protect the interests of the facility's residents.

~~H. Insufficient Grounds For Termination: No customer shall be given notice of termination of service nor shall the customer's service be terminated if:~~

~~1. The unpaid bill cited as grounds for termination is for utility service to any other customer (unless that customer has a legal obligation to pay the other customer's bill) or for any other class of service other than sewer.~~

~~2. An unpaid bill results from the purchase of nonutility goods or services.~~

~~I~~H. Restrictions On Termination; Opportunity To Avoid Termination Of Service:

1. When Termination Not Allowed: Unless the customer affected has consented, in writing, service shall not be terminated on any Friday after twelve o'clock (12:00) noon, or on Saturday, Sunday, or legal holidays recognized by the state of Idaho, or after twelve o'clock (12:00) noon on any day immediately preceding any legal holiday, or at any time when the city's business offices are not open for business, except as authorized by a condition immediately dangerous or hazardous to life, physical safety, or property exists, or if necessary to prevent a violation of federal, state, or local safety or health codes; or the city is ordered to terminate service by any court, the city council, or any other duly authorized public authority. Services may be terminated only between the hours of eight o'clock (8:00) A.M. and four o'clock (4:00) P.M., except as authorized by the court, city council, or dangers that are hazardous to life.

2. Personnel To Authorize Reconnection: The city shall have personnel available after the time of termination who are authorized to reconnect service if the conditions cited as grounds for termination are corrected to the city's satisfaction.

3. Opportunity To Prevent Termination Of Service: Immediately preceding termination of service, the customer may present evidence to the employee designated to terminate service that all outstanding bills are satisfied. Upon presentation of evidence that outstanding bills are satisfied, service shall not be terminated. ~~The employee shall be authorized to accept full payment and in such case shall not terminate service.~~

4. Notice Of Procedure For Reconnecting Service: The employee of the city designated to terminate service shall give to the customer or leave in a conspicuous location at the service address affected a notice showing the employee's name, the time of and grounds for termination, steps to be taken to secure reconnection, and the telephone numbers of utility personnel or other authorized representatives who are available to authorize reconnection.

5. No Termination While Council Action Pending: Except as authorized by order of the city council, service shall not be terminated for failure to pay amounts in dispute prior to the city council meeting where the customer has requested to appear before the city council.

~~H~~I. Termination Of Service To Master Metered Accounts And Residents Or Occupants Who Are Not Customers:

1. Notice To Occupants Or Residents Not Customers: Except if there is a condition immediately dangerous or hazardous to life, physical safety, or property exists, or if necessary to prevent a violation of federal, state, or local safety or health codes; or the city is ordered to terminate service by any court, the city council, or any other duly authorized public authority, no utility shall terminate service without providing written notice to the residents or occupants of:

a. A building or mobile home court where service is master metered, or

b. A residence where the customer billed for service is not a resident or occupant of the premises being served.

2. ~~Seven~~ Five Day Notice To Occupants Or Residents: The city must notify the residents or occupants of its intent to terminate service at least five (5) calendar days before the proposed date of termination. The notice should be delivered to the premises or, in the case of multi-occupant buildings or mobile home parks, posted in common areas or a conspicuous location. The notice shall state:

a. The date of the notice;

b. The proposed termination date;

c. The amount due for the most recent billing period; and

d. The resident(s) or occupant(s) can negotiate directly with the city to purchase future service at that location in the resident's(s') or occupant's(s') own name(s).

~~K~~J. Payment Agreements:

1. Agreements Allowed: When a customer cannot pay a bill in full, the city shall continue to serve the customer if the customer and the city agree on a reasonable portion of the outstanding bill to be paid immediately, and the manner in which the balance of the outstanding bill shall be paid. For customers who are unable to come to meet with the city to set up a payment agreement, the city clerk must, upon request by the customer, make a payment agreement over the telephone, by mail or at the customer's home.

2. Reasonableness: In deciding on the reasonableness of a particular agreement, the utility will take into account the customer's ability to pay, the size of the unpaid balance, the customer's payment history, and the amount of time and reasons why the debt is outstanding.

3. Application Of Payment: Payments are to be applied to the oldest balance owed on the customer's bill, except in the case of a disputed bill. If the customer disputes a bill, the customer's payments are to be applied to the oldest undisputed amount.

4. When Agreement Not Binding: No payment agreement shall be binding upon a customer if it requires the customer to forego any right provided for in these rules.

5. First Payment Due: The first payment, under the agreement, will be due one business day after the arrangement, unless the city grants an extension. If the initial payment is not made, or if any check not honored by the bank is offered as initial payment, the city may terminate service.

6. Third Party Contact: The city has been unable to contact a customer concerning termination, but has contacted the customer's third party and has failed to receive a response from the customer within seven (7) days after the third party was contacted, the city may treat the customer as one who has been contacted and has declined to enter into a reasonable payment agreement.

~~L. Grounds For Denial Or Termination With Prior Notice: The city may deny or terminate service to a resident, school, business, or industry without its permission, but only after adequate notice has been given in accordance with these rules, for one or more of the following reasons:~~

~~1. The customer or applicant did not pay undisputed delinquent bills or paid a delinquent bill with any check not honored by the bank.~~

~~2. The customer or applicant failed to make a required advance payment or pay a deposit when required.~~

~~3. The customer or applicant failed to comply with a payment agreement.~~

~~4. The customer or applicant misrepresented the customer's or applicant's identity for the purpose of obtaining utility service.~~

~~5. The customer or applicant denied or wilfully prevented the utility's access to the meter.~~

~~6. The city determines as prescribed by relevant state or other applicable standards that the customer is wilfully wasting service through improper equipment or otherwise.~~

~~7. The customer or applicant failed to apply for service with the city.~~

~~M. Requirements For And Contents Of Notice Before Termination: The city shall diligently attempt to contact the customer affected, either in person or by telephone, to apprise the customer of the proposed action. This oral notice shall contain the same information required above for written notice. The city shall maintain clear, written records of these oral notices, showing dates and the city employee giving the notices.N. Grounds For Termination Of Service Without Prior Notice: The city may terminate service without prior notice to the customer as~~

~~specified in subsection B of this section only:~~

~~1. If a condition immediately dangerous or hazardous to life, physical safety, or property exists, or if necessary to prevent a violation of federal, state, or local safety or health codes;~~

~~2. Upon order by any court, the city council, or any other duly authorized public authority;~~

~~3. If such service is obtained, diverted or used without the authorization or knowledge of the city; or~~

~~4. If the city has tried diligently to meet the notice requirements of subsection B of this section, but has been unsuccessful in its attempt to contact the customer.~~

~~O. Notice To City Council: No school or industrial customer shall have its service terminated unless the city council is given written notice seven (7) days before the termination. The city council may stay termination of service upon its finding that the public interest requires service to be maintained to the customer.~~ (Ord. 457, 5-12-1999)

10-2-~~16~~21: GARDENING SPRINKLERS REQUIRED:

It shall be unlawful for any city water user, while irrigating, to run water from an open faucet or an open hose. All water used for irrigation purposes must be through a nozzle or sprinkler. (Ord. 457, 5-12-1999)

10-2-~~17~~22: IRRIGATION SCHEDULES:

All metered irrigation sprinkling and gardening with city water shall be done only during the days and hours to be specified from time to time by the city council. (Ord. 457, 5-12-1999)

10-2-~~18~~23: EMERGENCY RESTRICTIONS:

The mayor and council are empowered to set restrictions and regulations which may be applied to all water users of the city for the purpose of regulating and restricting the use of water in times of drought conditions or other factors, upon a finding by the council that an emergency exists, or is threatened by reason of water shortage. Such rules and regulations shall be posted in at least four (4) public places in the city, including the office of the clerk, and shall take effect immediately upon such posting. Such regulation and restrictions shall remain in effect until they are countermanded by action of the council. (Ord. 457, 5-12-1999)

~~10-2-19: CHARGE FOR TURNING WATER OFF AND ON:~~

~~When water is turned off because the user is delinquent in paying for the water, and then is turned on after payment, a fee, established by resolution, shall be assessed.~~ (Ord. 457, 5-12-1999)

10-2-2~~0~~4: ILLEGAL USE:

When a water consumer supplies water from his taps to parties living on premises not connected with the city water system, who do not pay a water charge, except in cases of emergency, such consumer's water supply will be cut off after notice and remain shut off until a proper showing is made that this practice will be discontinued and a charge of five dollars ($5.00) will be made and must be paid before water service is turned on again. (Ord. 457, 5-12-1999)

10-2-2~~1~~5: INSPECTION:

The city may, at any time, inspect all taps and when a connection or fixture is found leaking unnecessarily, unless repaired as directed within twenty four (24) hours after being notified so to do, the water will be shut off, and a charge of five dollars ($5.00) will be made and must be paid before water will be turned on again. (Ord. 457, 5-12-1999)

10-2-2~~2~~6: SEPARATE TAPS:

Separate taps must be installed or an extra charge paid for each residence standing on one or more lots, owned by one person, where residences are occupied by different families. (Ord. 457, 5-12-1999)

10-2-2~~3~~7: WATER FUND:

All money derived from the operation of the city water works and the sale of water be placed in a fund to be hereafter known as the water fund. (Ord. 457, 5-12-1999)

~~10-2-24: CASH DEPOSIT.~~

~~Each new occupant desiring water service shall make application with the clerk. Before such service shall be instituted, the applicant shall pay a deposit, established by resolution, which shall be refunded to the depositor by the clerk after one year of good credit history, or at the time such service is discontinued, less any amount owing to the city by such person. (Ord. 457, 5-12-1999)~~

10-2-2~~5~~8: SUMMARY OF RULES:

The city shall make available to its customers a summary of this chapter approved by the city council. The summary shall be available at city hall. (Ord. 457, 5-12-1999)

10-2-~~26~~29: UNLAWFUL ACTS:

It shall be unlawful for any person, corporation or any city water user, person or corporation to violate any of the terms of this chapter. (Ord. 457, 5-12-1999)

10-2-~~27~~30: PENALTY:

Any person or corporation in violation of the provisions of this chapter shall be subject to penalty as provided in section 1-4-1 of this code. (Ord. 457, 5-12-1999; amd. 2004 Code)

Section 2: Severability. If any section, subsection, sentence, clause or phrase of this ordinance is held by a court of competent jurisdiction to be invalid, such decision shall not affect the remaining portions of this ordinance.

Section 3: Codification Clause. The City Clerk is instructed to immediately forward this ordinance to the codifier of the official municipal code for proper revision of the code.

Section 4: Repeal of Conflicting Ordinances. From and after the effective date of this ordinance, all prior ordinances which conflict with the provisions of this ordinance are repealed to the extent of such conflict.

Section 5: Publication. This Ordinance, or a summary thereof in compliance with Section 50-901A, Idaho Code, shall be published once in the official newspaper of the City, and shall take effect immediately upon its passage, approval, and publication.

Section 6: Effective Date. This ordinance shall be in full force and effect immediately upon its passage, approval and publication.

PASSED BY THE CITY COUNCIL AND APPROVED BY THE MAYOR of the City of Glenns Ferry, Idaho, this 11th day of June, 2013.

JoAnne Lanham

JoAnne Lanham, Mayor

Attest:

Debra Rowan

Debra Rowan, City Clerk/Treasurer

Appendix F

Large Water Connections

Meter Size (inches)	Name	Address	EDUs
1	B/C Apts	234 N Commercial	1.8
1	City (Welcome Sign Irr)	Bannock/w 1st	1.8
1	Elmore Fair	1219 E Frontage	1.8
1	Family Dollar	750 E 1st	1.8
1	Interface Protein Tech	138 S Custer	1.8
1	Jones (RV PARK)	1294 W Madison	1.8
1	City (RR Park Irr)	221 E Idaho	1.8
1	City (RR Park Irr)	399 E Idaho	1.8
1	Wildes Nest Apts	786 E 1st	1.8
1	Senior Center	492 E Cleveland	1.8
1.25	Amstutz Apts	392 S Ada	2.8
1.5	City (Park Restroom)	849 W Idaho	4
1.5	Elmore Fair	855 E 1st	4
1.5	GF Health Center	486 W 1st	4
1.5	School Dist Bus barn	800 Old HWY 30	4
1.5	Hansons Motel	105 E 1st	4
1.5	Last Resort SPA	128 E Idaho	4
2	Carmela Vineyards	1289 W Madison	7
2	Crop Production	503 W Idaho	7
2	E Elmore Rec Dist	851 W Idaho	7
2	GF Airport	2281 W Madison	7
2	GF Schools	639 N Bannock	7
2	Glenns Landing Apts	448 E 5th	7
2	LDS Church	874 Old HWY 30	7
2	Oregon Trail History Center	1083 S Three Isalnd Dr	7
2	Poplar Grove Assisted Living	356 E Cleveland	7
3	Syringa Court Apts	380 E 6th	16
3	Syringa Court Apts	220 E 6th	16
3	Three Island State park	603 S Three Island dr	16
4	CO Gen Partners	101 S Atlantic	7 *
Total EDUs			**162.8**

* According to the User Rate Resolution in Appendix A, 4" meters are assigned an EDU value of 28.

Co Gen Parners (Asssociated with the unused Idahoan Potato Plant) no longer uses the 28 EDU allotment of water

Appendix G

ISRB Fire Flow Recommendations

Needed Fire Flows for P Code 147 GLENNS FERRY

Stories	N.F.F.	PPC & W	OWNER	Address	
1	5,500	08 I-1	IDAHOAN FOODS INC	600 E HARRISON AVE	GLENNS FERRY
There are(is) 1 in this group					
* 1	4,500	05 P-1,I-1	SCHOOL DISTRICT NO 192	639 N BANNOCK AVE	GLENNS FERRY
There are(is) 1 in this group					
** ~~1~~	~~3,500~~	~~05~~	~~STEVE RIBEIRO~~	~~210 HANEY AVE~~	~~GLENNS FERRY~~
There are(is) 1 in this group					
2	3,000	05	IDAHOAN FOODS INC	600 E HARRISON AVE	GLENNS FERRY
1	3,000	05	NJOY LLC	1299 W MADISON AVE	GLENNS FERRY
There are(is) 2 in this group					
2	2,000	05	WORLDWIDE EQUINE, INC.	415 E 4TH ST	GLENNS FERRY
2	2,000	05	CITY OF GLENNS FERRY	211 W ARTHUR ST	GLENNS FERRY
There are(is) 2 in this group					
1	1,750	05	GLENNS FERRY VETERANS HALL	132 E 5TH AVE	GLENNS FERRY
There are(is) 1 in this group					
2	1,500	05	SCHOOL DISTRICT #192	639 N BANNOCK AVE	GLENNS FERRY
1	1,500	05	THREE ISLAND SR CITIZEN CNTR	492 E CLEVELAND AVE	GLENNS FERRY
1	1,500	05	IDAHOAN FOODS, INC.	600 E HARRISON AVE	GLENNS FERRY
There are(is) 3 in this group					
2	1,250	05	TRACY STEWART	28 E IDAHO AVE	GLENNS FERRY
1	1,250	05	HANSON'S CAFÉ	201 1ST AVE	GLENNS FERRY
There are(is) 2 in this group					
1	1,000	10 S-5	BECKY CRITCHLOW-HEART OF IDAH	771 S COMMERCIAL ST	GLENNS FERRY
There are(is) 1 in this group					
1	750	05	GLENNS FERRY PIZZA AND DELI	217 E 1ST AVE	GLENNS FERRY
1	750	05	TWILA ANDERSON	181 W 1ST ST	GLENNS FERRY
There are(is) 2 in this group					
1	500	10 S-5	BECKY CRITCHLOW-HEART OF IDAH	771 S COMMERCIAL ST	GLENNS FERRY
4	500	05	IDAHOAN FOODS INC	600 E HARRISON AVE	GLENNS FERRY
1	500	10 S-5	BECKY CRITCHLOW-HEART OF IDAH	771 S COMMERCIAL ST	GLENNS FERRY
1	500	05	IDAHOAN FOODS INC	600 E HARRISON AVE	GLENNS FERRY
1	500	05	IDAHOAN FOODS INC	600 E HARRISON AVE	GLENNS FERRY
1	500	05	THE STOP DRIVE INN	W 1ST AVE	GLENNS FERRY
1	500	05	WORLDWIDE EQUINE INC.	415 E 4TH ST	GLENNS FERRY
There are(is) 7 in this group					
Average Needed Fire Flow is			1,663		

* Because the school has fire suppression sprinklers installed, the required fire flow could be reduced to 1,500 gpm.

** This address does not exist in Glenns Ferry.

Test No.	Location	Needed Fire Flow	Serv. Level	Pressure (psi)			Orifice	GPM Results	
				Static	Residual	Pitot		Flowing	Flowing @ 20 psi
1	Bannock @ School	5000		74	65	60	2.50 "	1300	3400
2	Bannock @ School	1500		74	65	60	2.50 "	1300	3400
3	Madison @ Winery	3000		80	64	55	2.50 "	1240	2500
4	Madison @ Winery	1250		62	30	24	2.50 "	820	1000
5	Garfield @ Assisted Living	1500		66	40	30	2.50 "	920	1300
6	R.R. Tracks and Alturas	3000		64	60	18	2.50 "	710	2600
7	Fairgrounds	1500		62	50	8	2.50 "	470	900
8	Snake River and Owyhee	1000		62	55	2	2.50 "	240	600
9	Idaho and Commercial	1750		75	55	48	2.50 "	1160	2000

Appendix H

Existing System Model Results

Existing Peak Hour Pressures				
ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J10	0	2,662.03	2,726.49	27.93
J12	0	2,591.11	2,726.39	58.62
J14	1.19	2,576.79	2,726.38	64.82
J16	1.19	2,576.79	2,726.38	64.81
J18	0	2,577.74	2,726.38	64.41
J20	13.07	2,577.62	2,726.40	64.47
J22	1.19	2,577.60	2,726.41	64.48
J24	0	2,584.94	2,726.43	61.31
J26	0	2,576.97	2,726.44	64.77
J40	1.19	2,576.79	2,726.36	64.81
J42	2.38	2,577.12	2,726.29	64.63
J44	1.19	2,576.79	2,726.37	64.81
J46	13.07	2,577.00	2,726.36	64.72
J48	7.13	2,577.45	2,726.35	64.52
J50	4.75	2,578.11	2,726.23	64.18
J52	7.13	2,577.96	2,725.93	64.12
J54	3.56	2,577.78	2,725.91	64.19
J56	2.38	2,577.45	2,726.17	64.44
J58	1.19	2,577.45	2,726.19	64.45
J62	4.75	2,574.88	2,725.81	65.4
J64	8.32	2,575.12	2,725.81	65.3
J66	2.38	2,573.30	2,725.86	66.1
J68	8.32	2,577.17	2,725.88	64.43
J70	15.21	2,548.25	2,727.86	77.82
J72	9.51	2,558.84	2,728.34	73.45
J74	4.75	2,557.75	2,728.78	74.11
J76	10.69	2,560.89	2,729.09	72.88
J78	1.19	2,580.42	2,730.11	64.86
J80	8.32	2,579.18	2,729.81	65.27
J82	4.75	2,575.71	2,728.77	66.32
J84	1.19	2,518.70	2,728.77	91.02
J86	1.19	2,561.40	2,727.55	71.99
J88	4.75	2,562.42	2,727.55	71.55
J90	13.07	2,568.84	2,726.85	68.46
J92	7.13	2,573.27	2,726.64	66.46
J94	1.19	2,573.27	2,726.64	66.46
J96	5.94	2,572.60	2,726.62	66.74
J98	13.07	2,568.43	2,726.45	68.47
J100	4.75	2,557.12	2,726.35	73.33
J102	3.56	2,555.23	2,726.30	74.13
J104	9.51	2,554.73	2,726.25	74.32
J106	3.56	2,555.01	2,726.22	74.18
J108	4.52	2,554.81	2,726.20	74.26
J110	2.38	2,555.23	2,726.17	74.07
J112	0	2,555.14	2,726.17	74.11

J114	2.38	2,553.03	2,726.15	75.01
J116	2.38	2,552.52	2,726.11	75.22
J118	5.94	2,554.85	2,726.11	74.2
J120	4.75	2,555.86	2,726.09	73.76
J122	8.32	2,559.13	2,726.10	72.34
J124	8.32	2,563.20	2,726.10	70.59
J126	4.75	2,564.96	2,726.11	69.82
J128	0	2,564.91	2,726.11	69.85
J130	1.19	2,568.17	2,726.27	68.5
J132	1.19	2,568.13	2,726.29	68.53
J134	2.38	2,578.89	2,727.94	64.59
J136	1.19	2,555.14	2,726.17	74.11
J138	1.19	2,565.95	2,728.17	70.29
J140	4.75	2,572.43	2,727.82	67.33
J144	2.38	2,555.44	2,727.13	74.39
J146	9.51	2,560.83	2,726.27	71.69
J148	7.13	2,555.49	2,726.17	73.95
J150	7.13	2,561.70	2,726.11	71.24
J152	2.38	2,564.93	2,726.11	69.84
J154	7.13	2,565.77	2,726.25	69.53
J156	4.75	2,563.05	2,726.23	70.7
J158	8.32	2,561.09	2,726.21	71.55
J160	5.94	2,560.40	2,726.21	71.84
J162	5.94	2,559.07	2,726.20	72.42
J164	2.38	2,555.94	2,726.20	73.77
J166	0	2,555.59	2,726.20	73.92
J168	4.75	2,554.25	2,726.14	74.48
J170	9.51	2,555.19	2,726.21	74.11
J172	3.56	2,555.59	2,725.77	73.74
J174	11.88	2,556.99	2,725.44	72.99
J176	5.94	2,552.57	2,725.41	74.89
J178	0	2,543.60	2,725.41	78.78
J180	6.89	2,546.49	2,725.42	77.53
J182	0	2,570.65	2,725.63	67.15
J184	4.52	2,565.79	2,725.70	69.29
J186	1.19	2,564.98	2,725.86	69.71
J188	0	2,564.98	2,725.87	69.71
J190	1.19	2,562.09	2,725.87	70.97
J192	1.19	2,560.62	2,725.88	71.6
J194	3.56	2,563.18	2,725.89	70.5
J196	3.56	2,561.52	2,725.89	71.22
J198	2.38	2,559.66	2,725.88	72.02
J200	2.38	2,560.71	2,725.87	71.56
J202	4.75	2,566.32	2,725.87	69.13
J204	8.32	2,572.66	2,725.89	66.39
J206	1.19	2,576.18	2,725.89	64.87
J208	0	2,574.48	2,725.90	65.61

J210	3.56	2,572.97	2,725.89	66.26
J212	2.38	2,577.59	2,725.89	64.26
J214	7.13	2,582.83	2,725.96	62.02
J216	5.94	2,589.34	2,726.00	59.21
J218	9.27	2,579.78	2,725.97	63.35
J220	8.32	2,572.61	2,725.96	66.45
J222	7.13	2,574.20	2,725.95	65.75
J224	0	2,555.11	2,726.08	74.08
J226	1.19	2,553.97	2,726.08	74.57
J228	2.38	2,562.30	2,726.05	70.95
J230	1.19	2,562.69	2,726.05	70.79
J232	7.13	2,564.17	2,726.04	70.14
J234	4.75	2,561.06	2,726.00	71.47
J236	5.94	2,554.79	2,725.99	74.18
J238	2.38	2,552.23	2,725.99	75.29
J240	1.19	2,559.95	2,725.99	71.94
J242	1.19	2,563.81	2,726.01	70.28
J244	8.32	2,565.93	2,726.45	69.55
J246	9.51	2,579.04	2,725.00	63.24
J248	4.75	2,553.59	2,726.42	74.89
J254	2.38	2,578.90	2,727.94	64.58
J256	9.51	2,578.61	2,727.66	64.58
J258	8.32	2,577.38	2,727.52	65.06
J260	10.69	2,576.51	2,726.67	65.06
J262	0	2,550.74	2,734.56	79.65
J264	8.32	2,563.86	2,726.24	70.36
J266	8.08	2,566.73	2,726.24	69.12
J268	8.32	2,552.52	2,726.11	75.22
J270	2.38	2,568.13	2,726.27	68.52
J272	4.75	2,555.68	2,726.20	73.88
J274	2.38	2,577.96	2,725.15	63.78
J276	3.33	2,577.30	2,724.98	63.99
J278	4.75	2,577.01	2,725.91	64.52
J280	5.94	2,586.68	2,726.02	60.38
J284	2.38	2,591.69	2,726.03	58.21
J286	2.38	2,602.87	2,726.03	53.37
J288	4.75	2,605.67	2,726.04	52.15
J292	0	2,600.28	2,726.04	54.49
J294	0	2,599.51	2,726.12	54.86
J296	19.01	2,601.07	2,725.97	54.12
J298	19.01	2,609.29	2,725.96	50.55
J300	0	2,591.51	2,726.37	58.43
J302	2.38	2,577.45	2,726.13	64.42
J304	9.51	2,574.61	2,725.83	65.52
J306	7.13	2,577.21	2,725.81	64.39
J308	13.07	2,574.83	2,725.81	65.42
J310	7.13	2,575.29	2,725.81	65.22

J312	3.56	2,574.40	2,725.86	65.63
J314	1.19	2,577.27	2,725.87	64.39
J316	2.38	2,573.33	2,725.89	66.1
J318	3.56	2,569.40	2,725.92	67.82
J320	4.75	2,567.82	2,725.96	68.52
J322	7.13	2,572.17	2,725.89	66.61
J324	3.56	2,575.78	2,725.88	65.04
J326	0	2,573.96	2,725.88	65.83
J328	4.75	2,571.05	2,725.63	66.98
J330	1.19	2,575.92	2,725.87	64.97
J332	0	2,564.32	2,725.97	70.04
J334	1.19	2,564.36	2,725.97	70.03
J336	2.38	2,563.65	2,725.95	70.32
J338	3.56	2,567.01	2,725.93	68.86
J340	2.38	2,577.78	2,725.91	64.19
J342	3.56	2,569.16	2,725.90	67.91
J344	3.56	2,564.67	2,725.97	69.89
J346	9.27	2,564.99	2,725.94	69.74
J348	4.75	2,561.71	2,725.93	71.15
J350	2.14	2,553.36	2,725.92	74.77
J352	1.19	2,566.40	2,725.91	69.11
J354	4.75	2,566.95	2,725.93	68.88
J356	7.13	2,567.49	2,725.96	68.66
J358	4.75	2,568.75	2,725.91	68.1
J360	4.75	2,566.40	2,725.89	69.11
J362	0	2,563.86	2,725.98	70.25
J364	1.19	2,568.03	2,725.87	68.39
J366	4.75	2,569.35	2,725.86	67.82
J368	0	2,551.59	2,725.87	75.52
J370	14.26	2,571.78	2,725.72	66.7
J372	2.38	2,573.69	2,725.62	65.83
J374	4.52	2,579.28	2,725.97	63.56
J376	4.75	2,573.29	2,725.95	66.15
J378	8.32	2,571.76	2,725.94	66.81
J380	0	2,579.72	2,726.21	63.47
J382	2.38	2,580.20	2,726.21	63.27
J384	1.19	2,579.86	2,726.26	63.44
J386	1.19	2,579.84	2,726.25	63.44
J388	1.19	2,574.96	2,726.33	65.59
J390	9.51	2,573.75	2,726.34	66.12
J392	3.56	2,560.88	2,726.31	71.68
J394	7.13	2,562.72	2,726.30	70.88
J398	7.13	2,574.17	2,726.30	65.92
J400	1.19	2,559.40	2,726.31	72.32
J402	1.19	2,577.64	2,726.44	64.48
J406	11.88	2,595.18	2,726.02	56.69
J408	0	2,564.66	2,725.97	69.9

J410	5.94	2,574.05	2,725.86	65.78
J414	3.56	2,573.24	2,725.86	66.13
J416	2.38	2,528.95	2,729.09	86.72
J418	1.19	2,568.25	2,728.77	69.56
J420	0	2,576.46	2,726.17	64.87
J422	0	2,576.47	2,726.17	64.87
J424	1.19	2,576.47	2,726.17	64.87
J426	0	2,576.47	2,726.17	64.86
J428	0	2,576.53	2,726.17	64.84
J430	1.19	2,576.79	2,726.17	64.72
J432	2.38	2,554.93	2,726.30	74.25
J436	0	2,580.96	2,726.44	63.04
J438	0	2,599.53	2,726.42	54.98
J470	12.83	2,555.66	2,726.10	73.85
J472	0	2,573.94	2,726.28	66.01
J474	0	2,573.79	2,725.94	65.93
J476	0	2,576.79	2,726.37	64.81
J478	0	2,552.52	2,726.12	75.22
J36	0	2,552.55	2,726.77	75.49
J38	36.83	2,534.76	2,726.89	83.25
J28	0	2,587.47	2,726.56	60.27
J30	1.19	2,564.14	2,726.62	70.4
J32	0	2,553.11	2,726.68	75.21
J34	0	2,556.65	2,726.71	73.69

Existing Peak Hour Velocity and Headloss					
ID	Length (ft)	Diameter (in)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
P11	309.95	12	0.6	0.07	0.23
P13	1,150.33	14	0.44	0.07	0.06
P15	1,515.49	10	0.1	0.01	0.01
P17	407.18	10	0.09	0	0.01
P19	988.77	10	0.08	0	0
P21	1,690.63	10	0.13	0.02	0.01
P23	177.59	12	0.13	0	0.01
P25	694.45	12	0.25	0.02	0.03
P27	252.91	12	0.25	0.01	0.03
P29	1,432.05	12	0.42	0.12	0.08
P31	638.89	12	0.42	0.05	0.08
P33	720.52	12	0.42	0.06	0.09
P35	349.27	12	0.42	0.03	0.09
P37	692.35	12	0.42	0.06	0.09
P41	318.66	2	0.12	0.02	0.07
P43	264.2	2	0.28	0.09	0.34
P45	297.51	2	0.21	0.08	0.26
P47	334.66	10	0.2	0.01	0.03
P49	626.3	10	0.08	0	0
P51	545.57	4	0.3	0.12	0.23
P53	437.64	4	0.54	0.3	0.69
P55	298.22	4	0.13	0.01	0.05
P57	916.7	4	0.34	0.26	0.28
P59	31.96	4	0.46	0.02	0.5
P61	383.42	2	0.25	0.1	0.26
P63	378.93	4	0.43	0.17	0.44
P65	302.86	4	0.37	0.1	0.35
P67	277.78	4	0.03	0	0
P69	358.62	4	0.24	0.05	0.15
P71	314.6	6	0.19	0.02	0.05
P73	337.72	4	0.23	0.05	0.14
P75	3,091.61	10	0.75	0.97	0.31
P77	1,053.65	10	0.93	0.49	0.46
P79	877.9	10	0.97	0.44	0.5
P81	604.77	10	0.99	0.31	0.52
P83	942.13	10	1.23	1.02	1.08
P85	166.14	10	1.61	0.3	1.78
P87	605.42	10	1.58	1.04	1.71
P89	362.16	8	0.01	0	0
P91	2,745.69	6	0.32	0.31	0.11
P93	50.73	4	0.17	0	0.08
P95	607.34	4	0.71	0.7	1.15
P97	913.27	4	0.3	0.21	0.23
P99	37.06	8	0.03	0	0
P101	24.22	8	1.11	0.03	1.17

P103	613.37	10	0.69	0.16	0.26
P105	629.08	10	0.54	0.11	0.17
P107	320.71	10	0.52	0.05	0.16
P109	310.21	10	0.5	0.04	0.14
P111	309.67	10	0.42	0.03	0.1
P113	312.29	10	0.36	0.03	0.08
P115	312.62	10	0.38	0.03	0.09
P117	20.18	10	0.29	0	0.06
P119	31.58	10	0.08	0	0
P121	655.04	6	0.19	0.03	0.05
P123	270.01	8	0.04	0	0
P125	255.69	10	0.23	0.01	0.03
P127	320.83	10	0.1	0	0.01
P129	324.46	10	0.14	0	0.01
P131	297.94	10	0.17	0.01	0.02
P133	25.94	8	0.3	0	0.1
P135	291.06	8	0.74	0.16	0.55
P137	16.76	8	1.07	0.02	1.09
P139	292.09	8	1.14	0.35	1.22
P141	308.8	8	2.22	1.3	4.21
P143	168.99	8	2.42	0.83	4.91
P145	241.08	6	0.21	0.02	0.06
P147	324.76	4	1.16	0.92	2.83
P149	280.02	2	0.49	0.35	1.27
P153	283.24	4	1.01	0.62	2.19
P155	263.91	4	0.85	0.42	1.6
P157	614.55	4	0.79	0.86	1.39
P159	308.63	4	0.37	0.1	0.34
P161	589.55	4	0.19	0.06	0.1
P163	341.62	8	0	0	0
P165	29.87	4	0.06	0	0.02
P167	23.7	8	0.32	0	0.11
P169	342.87	8	0.26	0.02	0.06
P171	317.91	8	0.23	0.01	0.04
P173	303.6	8	0.17	0.01	0.03
P175	312.95	8	0.14	0.01	0.02
P177	293.93	8	0.1	0	0.01
P179	21.3	8	0.02	0	0
P181	29.28	8	0.08	0	0.01
P183	334.08	4	0.25	0.06	0.17
P185	317.95	8	0.35	0.03	0.1
P187	332.57	8	0.32	0.03	0.08
P189	315.65	4	0.26	0.06	0.18
P191	565.16	6	0.11	0.01	0.02
P193	653.53	4	0.51	0.4	0.62
P195	762.64	4	0.42	0.33	0.43
P197	739.81	4	0.12	0.03	0.04

P199	807.13	4	0.04	0	0
P201	831.38	4	0.04	0	0
P203	1,749.90	4	0.21	0.21	0.12
P205	567.57	4	0.21	0.07	0.12
P207	305.53	4	0.47	0.16	0.54
P209	15.96	4	0.25	0	0.17
P211	328.27	4	0.06	0	0.01
P213	306.91	4	0.09	0.01	0.02
P215	328.58	4	0.12	0.01	0.04
P217	24.43	4	0.18	0	0.07
P219	331.52	6	0.16	0.01	0.04
P221	310.2	6	0.14	0.01	0.03
P223	331.36	6	0.11	0.01	0.02
P225	43.53	4	0.2	0	0.11
P227	641.64	4	0.11	0.02	0.03
P229	387.82	10	0.05	0	0
P231	67.32	4	0.09	0	0.03
P233	35.34	4	0.09	0	0.02
P235	43.41	10	0.04	0	0.01
P237	266.19	4	0.32	0.07	0.26
P239	326.26	4	0.21	0.04	0.12
P241	319.32	10	0.32	0.03	0.09
P243	286.24	10	0.22	0.01	0.04
P245	367.01	6	0.16	0.01	0.03
P247	550.24	4	0.18	0.05	0.09
P249	295.41	10	0	0	0
P251	307.8	10	0.26	0.01	0.04
P253	689.5	10	0.25	0.03	0.04
P255	201.37	10	0	0	0
P257	258.22	10	0.24	0.01	0.04
P259	313.03	4	0.23	0.04	0.14
P261	313.97	4	0.11	0.01	0.03
P263	334.01	4	0.04	0	0.01
P265	323.77	8	0.03	0	0
P267	433.62	4	0.13	0.02	0.05
P269	179.78	10	0.45	0.03	0.17
P271	330.2	8	0.43	0.07	0.2
P273	284.56	8	0.14	0.01	0.03
P275	315.2	2	0.97	1.44	4.58
P277	601.76	4	0.12	0.03	0.04
P279	23.84	8	0.02	0	0
P281	300.91	4	0.64	0.29	0.95
P283	332.15	4	0.4	0.13	0.4
P285	293.97	2	0.76	0.85	2.9
P287	285.97	2	0.33	0.18	0.63
P289	293.54	8	4.44	4.45	15.16
P291	310.67	4	0.18	0.03	0.09

P293	308	4	0.03	0	0
P295	302.63	4	0.24	0.05	0.15
P297	290.38	8	0.05	0	0
P299	283.59	8	0.3	0.02	0.07
P301	280.49	8	0.05	0	0
P303	310.29	2	0.58	0.55	1.78
P305	260.6	2	0.34	0.17	0.65
P307	353.19	4	0.21	0.04	0.12
P309	382.48	4	0.33	0.11	0.28
P315	317.13	10	0.14	0	0.01
P317	299.26	4	0.3	0.07	0.23
P319	298.53	10	0.38	0.04	0.12
P321	325.47	10	0.18	0.01	0.02
P323	299.45	4	0.1	0.01	0.03
P325	326.42	6	0.47	0.08	0.24
P327	297.86	10	0.58	0.08	0.27
P329	322.09	6	0.43	0.06	0.2
P331	317.72	6	0.22	0.02	0.06
P333	585.16	10	0.75	0.25	0.43
P335	54.77	10	0.76	0.02	0.44
P337	938.87	2	0.24	0.24	0.25
P339	308.67	4	0.43	0.14	0.44
P341	305.8	4	0.18	0.03	0.09
P343	342.03	4	0	0	0
P345	327.48	8	0.07	0	0.01
P347	279.58	4	0.06	0	0.01
P349	355.22	4	0.24	0.05	0.15
P351	298.74	6	0.17	0.01	0.04
P353	227.72	6	0.18	0.01	0.05
P355	334.84	6	0.27	0.03	0.1
P357	302.73	6	0.31	0.04	0.13
P359	330.25	10	0.08	0	0.01
P361	304.65	4	0.29	0.06	0.21
P363	331.55	4	0.1	0.01	0.03
P365	297.04	4	0.01	0	0
P367	28.82	4	0.14	0	0.05
P369	202.19	2	0.49	0.26	1.27
P371	128.79	2	0.12	0.01	0.1
P373	321.06	10	0.22	0.01	0.04
P375	26.11	12	0.23	0	0.03
P377	276.41	6	0.24	0.02	0.08
P379	328.06	6	0.21	0.02	0.06
P381	278.62	6	0.17	0.01	0.04
P383	374	6	0.14	0.01	0.03
P385	360.77	2	0.13	0.04	0.11
P387	55.72	12	0.08	0	0
P389	252.47	6	0.28	0.03	0.1

P391	319.9	6	0.17	0.01	0.04
P393	288.28	6	0.12	0.01	0.02
P395	318.67	4	0.21	0.03	0.1
P397	295.39	6	0.19	0.02	0.05
P399	303.34	6	0.21	0.02	0.06
P401	319.7	6	0.26	0.03	0.09
P403	317.59	4	0.27	0.05	0.16
P405	304.81	4	0.15	0.02	0.05
P407	296.32	4	0.03	0	0
P409	259.86	12	0.29	0.01	0.04
P411	209.84	10	0.42	0.03	0.15
P413	284.73	4	0.2	0.03	0.11
P415	100.08	4	0.17	0.01	0.08
P417	272.46	6	0.02	0	0
P419	674.86	4	0	0	0
P421	356.76	4	0.42	0.16	0.44
P423	288.63	2	0.24	0.1	0.35
P425	316.08	6	0.03	0	0
P427	420.89	6	0.37	0.09	0.21
P429	384.86	6	0.15	0.01	0.04
P431	574.13	6	0.09	0.01	0.01
P433	680.04	6	0.56	0.24	0.36
P435	33.6	6	0.27	0	0.09
P437	412.89	6	0.29	0.04	0.11
P439	294.32	6	0.18	0.01	0.04
P441	410.33	6	0.16	0.01	0.04
P443	550.49	6	0.48	0.15	0.27
P445	606.42	6	0.3	0.07	0.11
P447	57.74	6	0.33	0.01	0.13
P449	662.79	6	0.19	0.03	0.05
P451	299.36	6	0.14	0.01	0.03
P455	267.4	6	0.32	0.03	0.13
P457	609.01	6	0.06	0	0.01
P459	312.63	6	0.01	0	0
P461	259.36	6	0.64	0.11	0.41
P463	66.59	6	0.01	0	0
P465	376.07	10	0.08	0	0
P467	311.1	10	0.13	0	0.01
P469	39.26	8	0	0	0
P471	17.11	10	0.09	0	0.01
P473	24.63	4	0.12	0	0.04
P475	23.05	4	0.04	0	0
P477	460	8	0.02	0	0
P479	62.34	8	0.01	0	0
P481	303.75	4	0.06	0	0.01
P483	97.07	4	0.03	0	0.01
P485	10.76	4	0.03	0	0

P487	44.62	8	0	0	0
P489	75.35	8	0	0	0
P491	161.45	4	0.03	0	0
P493	12.94	8	0.02	0	0
P495	512.42	12	1.97	0.77	1.5
P497	118.39	12	1.97	0.18	1.5
P501	186.61	12	0.25	0.01	0.03
P503	480.73	14	0.44	0.03	0.06
P543	339.26	10	0.17	0.01	0.02
P545	159.91	6	0.3	0.02	0.11
P547	104.75	6	0.09	0	0.01
P551	675.35	10	0.13	0.01	0.01
P553	268.94	10	0.21	0.01	0.03
P555	328.15	6	0.19	0.01	0.03
P39	1,419.58	12	0.42	0.12	0.09

Appendix I

Future System Model Results

Future Peak Hour Pressures				
ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J10	0	2,662.03	2,725.27	27.4
J100	5.94	2,557.12	2,720.47	70.78
J102	3.56	2,555.23	2,720.39	71.56
J104	10.69	2,554.73	2,720.32	71.75
J106	9.51	2,555.01	2,720.27	71.6
J108	14.02	2,554.81	2,720.24	71.68
J110	7.13	2,555.23	2,720.20	71.48
J112	0	2,555.14	2,720.20	71.52
J114	5.94	2,553.03	2,720.20	72.43
J116	2.38	2,552.52	2,720.20	72.66
J118	5.94	2,554.85	2,720.20	71.64
J12	0	2,591.11	2,724.06	57.61
J120	4.75	2,555.86	2,720.20	71.21
J122	8.32	2,559.13	2,720.21	69.79
J124	8.32	2,563.20	2,720.21	68.04
J126	4.75	2,564.96	2,720.23	67.28
J128	0	2,564.91	2,720.23	67.3
J130	1.19	2,568.17	2,720.41	65.96
J132	1.19	2,568.13	2,720.43	65.99
J134	2.38	2,578.89	2,722.84	62.38
J136	8.08	2,555.14	2,720.20	71.52
J138	1.19	2,565.95	2,722.09	67.65
J14	5.94	2,576.79	2,721.89	62.87
J140	4.75	2,572.43	2,721.73	64.69
J144	25.9	2,555.44	2,720.42	71.48
J146	9.51	2,560.83	2,720.23	69.07
J148	7.13	2,555.49	2,720.22	71.38
J150	7.13	2,561.70	2,720.22	68.69
J152	2.38	2,564.93	2,720.22	67.29
J154	7.13	2,565.77	2,720.36	66.99
J156	4.75	2,563.05	2,720.33	68.15
J158	8.32	2,561.09	2,720.30	68.98
J16	9.51	2,576.79	2,721.33	62.63
J160	5.94	2,560.40	2,720.28	69.28
J162	5.94	2,559.07	2,720.26	69.84
J164	2.38	2,555.94	2,720.25	71.19
J166	0	2,555.59	2,720.25	71.35
J168	4.75	2,554.25	2,720.20	71.91
J170	25.9	2,555.19	2,720.21	71.51
J172	49.19	2,555.59	2,715.03	69.09
J174	21.39	2,556.99	2,714.04	68.05
J176	16.4	2,552.57	2,713.95	69.92
J178	10.69	2,543.60	2,714.04	73.85
J18	155.43	2,577.74	2,719.60	61.47
J180	6.89	2,546.49	2,714.49	72.8

J182	17.82	2,570.65	2,716.19	63.06
J184	4.52	2,565.79	2,717.67	65.81
J186	1.19	2,564.98	2,719.85	67.11
J188	0	2,564.98	2,719.90	67.13
J190	1.19	2,562.09	2,719.93	68.39
J192	1.19	2,560.62	2,719.96	69.04
J194	3.56	2,563.18	2,720.01	67.95
J196	3.56	2,561.52	2,720.01	68.67
J198	2.38	2,559.66	2,719.95	69.46
J20	13.07	2,577.62	2,719.28	61.38
J200	2.38	2,560.71	2,719.90	68.98
J202	4.75	2,566.32	2,720.00	66.59
J204	8.32	2,572.66	2,720.36	64
J206	1.19	2,576.18	2,720.36	62.47
J208	0	2,574.48	2,720.36	63.21
J210	3.56	2,572.97	2,720.36	63.87
J212	2.38	2,577.59	2,720.36	61.86
J214	7.13	2,582.83	2,720.82	59.79
J216	5.94	2,589.34	2,720.90	57
J218	9.27	2,579.78	2,720.57	61.01
J22	19.96	2,577.60	2,719.27	61.38
J220	8.32	2,572.61	2,720.37	64.02
J222	7.13	2,574.20	2,720.36	63.33
J224	8.32	2,555.11	2,720.20	71.53
J226	1.19	2,553.97	2,720.20	72.02
J228	2.38	2,562.30	2,720.20	68.41
J230	1.19	2,562.69	2,720.20	68.25
J232	7.13	2,564.17	2,720.20	67.61
J234	4.75	2,561.06	2,720.16	68.94
J236	5.94	2,554.79	2,720.15	71.65
J238	2.38	2,552.23	2,720.16	72.76
J24	53.94	2,584.94	2,719.25	58.2
J240	1.19	2,559.95	2,720.16	69.42
J242	1.19	2,563.81	2,720.19	67.76
J244	8.32	2,565.93	2,720.62	67.03
J246	9.51	2,579.04	2,719.18	60.72
J248	9.27	2,553.59	2,720.53	72.33
J254	2.38	2,578.90	2,722.84	62.37
J256	9.51	2,578.61	2,722.50	62.35
J258	8.32	2,577.38	2,722.33	62.81
J26	13.07	2,576.97	2,719.25	61.65
J260	10.69	2,576.51	2,720.89	62.56
J262	0	2,550.74	2,734.40	79.58
J264	8.32	2,563.86	2,720.24	67.76
J266	8.08	2,566.73	2,720.28	66.53
J268	8.32	2,552.52	2,720.20	72.66
J270	2.38	2,568.13	2,720.40	65.98

J272	4.75	2,555.68	2,720.25	71.31
J274	7.13	2,577.96	2,707.79	56.25
J276	19.96	2,577.30	2,703.08	54.5
J278	11.64	2,577.01	2,720.37	62.12
J28	17.11	2,587.47	2,719.31	57.13
J280	17.82	2,586.68	2,721.15	58.27
J284	7.13	2,591.69	2,721.18	56.11
J286	11.88	2,602.87	2,721.20	51.27
J288	11.64	2,605.67	2,721.23	50.07
J292	24.95	2,600.28	2,721.32	52.44
J294	25.43	2,599.51	2,721.83	53
J296	28.52	2,601.07	2,721.08	52
J298	47.05	2,609.29	2,720.99	48.4
J30	28.28	2,564.14	2,719.34	67.25
J300	5.94	2,591.51	2,723.85	57.34
J302	17.59	2,577.45	2,714.27	59.29
J304	9.51	2,574.61	2,719.90	62.95
J306	7.13	2,577.21	2,719.50	61.66
J308	13.07	2,574.83	2,719.23	62.57
J310	8.32	2,575.29	2,719.24	62.37
J312	3.56	2,574.40	2,719.33	62.8
J314	1.19	2,577.27	2,719.55	61.65
J316	2.38	2,573.33	2,719.73	63.43
J318	3.56	2,569.40	2,719.97	65.24
J32	12.83	2,553.11	2,719.40	72.05
J320	4.75	2,567.82	2,720.20	66.03
J322	9.27	2,572.17	2,720.00	64.05
J324	6.89	2,575.78	2,719.81	62.41
J326	0	2,573.96	2,719.73	63.16
J328	4.75	2,571.05	2,719.48	64.31
J330	1.19	2,575.92	2,719.72	62.31
J332	0	2,564.32	2,720.18	67.54
J334	1.19	2,564.36	2,720.18	67.52
J336	2.38	2,563.65	2,720.07	67.78
J338	3.56	2,567.01	2,719.94	66.26
J34	29.94	2,556.65	2,719.43	70.54
J340	2.38	2,577.78	2,719.84	61.56
J342	3.56	2,569.16	2,719.73	65.24
J344	3.56	2,564.67	2,720.18	67.39
J346	9.27	2,564.99	2,720.13	67.22
J348	4.75	2,561.71	2,720.09	68.62
J350	11.64	2,553.36	2,720.06	72.23
J352	1.19	2,566.40	2,720.06	66.58
J354	4.75	2,566.95	2,720.12	66.37
J356	7.13	2,567.49	2,720.20	66.17
J358	4.75	2,568.75	2,720.09	65.58
J36	6.89	2,552.55	2,719.52	72.35

J360	4.75	2,566.40	2,720.03	66.57
J362	0	2,563.86	2,720.19	67.74
J364	1.19	2,568.03	2,719.20	65.5
J366	4.75	2,569.35	2,719.18	64.92
J368	24.71	2,551.59	2,718.76	72.43
J370	14.26	2,571.78	2,718.88	63.74
J372	2.38	2,573.69	2,718.78	62.87
J374	17.59	2,579.28	2,718.89	60.49
J376	25.9	2,573.29	2,718.72	63.02
J378	8.32	2,571.76	2,718.67	63.66
J38	29.7	2,534.76	2,719.72	80.14
J380	11.88	2,579.72	2,718.96	60.33
J382	2.38	2,580.20	2,718.97	60.13
J384	5.7	2,579.86	2,719.14	60.35
J386	1.19	2,579.84	2,719.16	60.37
J388	5.94	2,574.96	2,718.98	62.4
J390	10.69	2,573.75	2,718.99	62.93
J392	9.51	2,560.88	2,718.85	68.45
J394	28.28	2,562.72	2,718.85	67.65
J398	15.45	2,574.17	2,718.93	62.72
J40	4.75	2,576.79	2,721.60	62.74
J400	29.7	2,559.40	2,718.81	69.07
J402	2.38	2,577.64	2,719.25	61.36
J406	11.88	2,595.18	2,721.17	54.59
J408	0	2,564.66	2,720.18	67.39
J410	5.94	2,574.05	2,719.33	62.95
J414	3.56	2,573.24	2,719.18	63.24
J416	58.7	2,528.95	2,723.45	84.28
J418	5.94	2,568.25	2,724.06	67.51
J42	8.32	2,577.12	2,720.06	61.93
J420	1.19	2,576.46	2,719.64	62.04
J422	0	2,576.47	2,719.64	62.04
J424	2.38	2,576.47	2,719.64	62.04
J426	2.38	2,576.47	2,719.64	62.03
J428	0	2,576.53	2,719.64	62.01
J430	2.38	2,576.79	2,719.64	61.89
J432	3.56	2,554.93	2,720.39	71.69
J436	4.75	2,580.96	2,719.25	59.92
J438	0	2,599.53	2,724.56	54.18
J44	2.38	2,576.79	2,720.09	62.09
J46	13.07	2,577.00	2,720.07	61.99
J470	12.83	2,555.66	2,720.20	71.29
J472	7.13	2,573.94	2,718.93	62.82
J474	14.26	2,573.79	2,718.67	62.78
J476	9.51	2,576.79	2,720.11	62.1
J478	0	2,552.52	2,720.20	72.65
J48	7.13	2,577.45	2,720.06	61.79

J482	8.32	2,536.94	2,719.72	79.2
J484	0	2,535.46	2,719.72	79.84
J486	0	2,535.15	2,719.72	79.97
J50	4.75	2,578.11	2,719.19	61.13
J52	7.13	2,577.96	2,719.14	61.18
J54	3.56	2,577.78	2,719.23	61.29
J56	2.38	2,577.45	2,719.68	61.63
J58	1.19	2,577.45	2,719.72	61.64
J62	4.75	2,574.88	2,719.23	62.55
J64	9.51	2,575.12	2,719.18	62.42
J66	2.38	2,573.30	2,719.18	63.21
J68	8.32	2,577.17	2,719.04	61.47
J70	53.47	2,548.25	2,721.17	74.93
J72	36.12	2,558.84	2,722.00	70.7
J74	23.76	2,557.75	2,722.84	71.54
J76	10.69	2,560.89	2,723.51	70.46
J78	4.52	2,580.42	2,726.02	63.09
J80	8.32	2,579.18	2,725.59	63.44
J82	4.75	2,575.71	2,724.06	64.28
J84	1.19	2,518.70	2,724.06	88.98
J86	11.88	2,561.40	2,721.00	69.16
J88	7.13	2,562.42	2,721.07	68.75
J90	13.07	2,568.84	2,720.91	65.89
J92	7.13	2,573.27	2,720.91	63.97
J94	1.19	2,573.27	2,720.91	63.97
J96	5.94	2,572.60	2,720.87	64.24
J98	13.07	2,568.43	2,720.63	65.95

Future Peak Hour Velocity and Headloss					
ID	Length (ft)	Diameter (in)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/kft)
P101	24.22	8	1.36	0.04	1.69
P103	613.37	10	0.85	0.24	0.39
P105	629.08	10	0.68	0.16	0.26
P107	320.71	10	0.66	0.08	0.24
P109	310.21	10	0.63	0.07	0.22
P11	309.95	12	2.85	1.29	4.16
P111	309.67	10	0.54	0.05	0.17
P113	312.29	10	0.39	0.03	0.09
P115	312.62	10	0.45	0.04	0.12
P117	20.18	10	0.1	0	0.01
P119	31.58	10	0.06	0	0
P121	655.04	6	0.02	0	0
P123	270.01	8	0.06	0	0
P125	594.95	10	0.01	0	0
P127	320.83	10	0.17	0.01	0.02
P129	324.46	10	0.21	0.01	0.03
P13	671.04	14	2.1	0.71	1.05
P131	297.94	10	0.24	0.01	0.04
P133	25.94	8	0.4	0	0.18
P135	291.06	8	0.78	0.18	0.61
P137	16.76	8	1.22	0.02	1.37
P139	292.09	8	1.34	0.48	1.64
P141	308.8	8	2.76	1.94	6.27
P143	168.99	8	2.96	1.21	7.17
P145	241.08	6	0.09	0	0.01
P147	324.76	4	1.47	1.42	4.37
P149	280.02	2	0.49	0.35	1.27
P15	1,515.49	10	1.71	2.17	1.43
P153	283.24	4	1.31	1.01	3.57
P155	263.91	4	1.01	0.58	2.19
P157	614.55	4	0.35	0.19	0.31
P159	308.63	4	0.13	0.02	0.05
P161	589.55	4	0.05	0	0.01
P163	341.62	8	0.06	0	0
P165	29.87	4	0.29	0.01	0.21
P167	23.7	8	0.43	0	0.21
P169	342.87	8	0.37	0.04	0.11
P17	407.18	10	1.67	0.56	1.36
P171	317.91	8	0.34	0.03	0.09
P173	303.6	8	0.28	0.02	0.07
P175	312.95	8	0.25	0.02	0.05
P177	293.93	8	0.21	0.01	0.04
P179	21.3	8	0.13	0	0.01
P181	29.28	8	0.21	0	0.04
P183	334.08	4	0.24	0.05	0.15

P185	317.95	8	0.08	0	0.01
P187	332.57	8	0.05	0	0
P189	315.65	4	0.29	0.07	0.22
P19	988.77	10	1.58	1.22	1.24
P191	565.16	6	0.29	0.06	0.1
P193	653.53	4	2.02	5.17	7.91
P195	762.64	4	0.76	0.99	1.3
P197	739.81	4	0.22	0.09	0.13
P199	807.13	4	0.2	0.09	0.11
P201	831.38	4	0.48	0.45	0.54
P203	1,749.90	4	0.65	1.7	0.97
P205	567.57	4	1.11	1.47	2.6
P207	305.53	4	1.91	2.19	7.16
P209	15.96	4	1.21	0.05	3.06
P21	1,690.63	10	0.58	0.32	0.19
P211	328.27	4	0.17	0.03	0.08
P213	306.91	4	0.2	0.03	0.11
P215	328.58	4	0.23	0.05	0.14
P217	24.43	4	0.15	0	0.06
P219	331.52	6	0.38	0.06	0.19
P221	310.2	6	0.35	0.05	0.16
P223	331.36	6	0.33	0.05	0.14
P225	43.53	4	1.04	0.1	2.31
P227	641.64	4	0.48	0.36	0.56
P229	387.82	10	0.11	0	0.01
P23	177.59	12	0.36	0.01	0.06
P231	67.32	4	0.09	0	0.03
P233	35.34	4	0.09	0	0.03
P235	43.41	10	0.13	0	0.01
P237	266.19	4	0.88	0.45	1.7
P239	326.26	4	0.31	0.08	0.24
P241	319.32	10	1.19	0.32	1.01
P243	286.24	10	0.99	0.21	0.72
P245	367.01	6	0.08	0	0.01
P247	550.24	4	0	0	0
P249	295.41	10	0.03	0	0
P25	694.45	12	0.19	0.01	0.02
P251	307.8	10	0.09	0	0.01
P253	689.5	10	0.05	0	0
P255	201.37	10	0	0	0
P257	258.22	10	0.04	0	0
P259	313.03	4	0.2	0.04	0.11
P261	313.97	4	0.08	0.01	0.02
P263	334.01	4	0.07	0.01	0.02
P265	323.77	8	0.03	0	0
P267	433.62	4	0.16	0.03	0.07
P269	179.78	10	0.17	0	0.03

P27	252.91	12	0.04	0	0
P271	330.2	8	0.3	0.03	0.11
P273	284.56	8	0.17	0.01	0.04
P275	315.2	2	0.97	1.44	4.58
P277	601.76	4	0.24	0.09	0.15
P279	23.84	8	0.02	0	0
P281	300.91	4	0.71	0.34	1.13
P283	332.15	4	0.46	0.17	0.52
P285	293.97	2	1.01	1.44	4.9
P287	285.97	2	0.09	0.01	0.05
P289	293.54	8	6.25	8.38	28.54
P29	1,432.05	12	0.27	0.06	0.04
P291	310.67	4	0.03	0	0
P293	308	4	0.24	0.05	0.15
P295	302.63	4	0.45	0.15	0.48
P297	290.38	8	0.05	0	0
P299	283.59	8	0.41	0.04	0.13
P301	280.49	8	0.18	0.01	0.04
P303	310.29	2	2.77	9.88	31.83
P305	260.6	2	2.04	4.71	18.08
P307	353.19	4	0.68	0.37	1.04
P309	382.48	4	0.97	0.78	2.05
P31	638.89	12	0.32	0.03	0.05
P315	317.13	10	0.31	0.02	0.06
P317	299.26	4	0.76	0.38	1.28
P319	298.53	10	1.26	0.34	1.13
P321	325.47	10	0.41	0.03	0.1
P323	299.45	4	0.39	0.11	0.38
P325	326.42	6	1.32	0.52	1.59
P327	297.86	10	1.72	0.6	2.02
P329	322.09	6	0.86	0.23	0.72
P33	720.52	12	0.4	0.06	0.08
P331	317.72	6	0.53	0.1	0.3
P333	585.16	10	2.3	2.02	3.45
P335	54.77	10	2.39	0.2	3.72
P337	938.87	2	1.8	9.58	10.2
P339	308.67	4	1.01	0.67	2.18
P341	305.8	4	0.76	0.4	1.31
P343	342.03	4	0.58	0.27	0.79
P345	327.48	8	0.09	0	0.01
P347	279.58	4	0.1	0.01	0.03
P349	355.22	4	0.31	0.09	0.25
P35	349.27	12	0.44	0.03	0.09
P351	298.74	6	0.81	0.23	0.76
P353	227.72	6	0.82	0.18	0.78
P355	334.84	6	0.78	0.24	0.71
P357	302.73	6	0.82	0.23	0.77

P359	330.25	10	0.81	0.16	0.5
P361	304.65	4	0.73	0.36	1.2
P363	331.55	4	0.49	0.19	0.58
P365	297.04	4	0.32	0.08	0.25
P367	28.82	4	0.16	0	0.08
P369	202.19	2	0.49	0.26	1.27
P37	692.35	12	0.52	0.09	0.13
P371	128.79	2	0.12	0.01	0.1
P373	321.06	10	0.24	0.01	0.04
P375	26.11	12	0.06	0	0.01
P377	276.41	6	0.59	0.12	0.43
P379	328.06	6	0.57	0.13	0.39
P381	278.62	6	0.53	0.1	0.34
P383	374	6	0.5	0.12	0.31
P385	360.77	2	0.45	0.4	1.11
P387	55.72	12	0.11	0	0.01
P389	252.47	6	0.41	0.05	0.22
P39	1,419.58	12	0.54	0.2	0.14
P391	319.9	6	0.31	0.04	0.13
P393	288.28	6	0.25	0.03	0.09
P395	318.67	4	0.27	0.05	0.16
P397	295.39	6	0.37	0.05	0.18
P399	303.34	6	0.38	0.06	0.19
P401	319.7	6	0.44	0.08	0.24
P403	317.59	4	0.41	0.11	0.35
P405	304.81	4	0.29	0.06	0.19
P407	296.32	4	0.17	0.02	0.07
P409	259.86	12	0.1	0	0.01
P41	318.66	2	0.49	0.29	0.9
P411	209.84	10	0.14	0	0.02
P413	284.73	4	0.92	0.52	1.84
P415	100.08	4	0.26	0.02	0.18
P417	272.46	6	0.06	0	0.01
P419	674.86	4	0.63	0.44	0.65
P421	356.76	4	0.42	0.16	0.44
P423	288.63	2	0.24	0.1	0.35
P425	316.08	6	0.61	0.14	0.46
P427	420.89	6	0.48	0.15	0.35
P429	384.86	6	0.55	0.17	0.44
P43	264.2	2	1.2	1.27	4.82
P431	574.13	6	0.26	0.05	0.09
P433	680.04	6	0.27	0.06	0.09
P435	33.6	6	0.58	0.01	0.38
P437	412.89	6	0.61	0.17	0.41
P439	294.32	6	0.22	0.02	0.06
P441	410.33	6	0.24	0.03	0.07
P443	550.49	6	0.45	0.13	0.24

P445	606.42	6	0.18	0.03	0.04
P447	57.74	6	0.47	0.01	0.23
P449	662.79	6	0.44	0.14	0.21
P45	297.51	2	0.13	0.03	0.11
P451	299.36	6	0	0	0
P455	267.4	6	0.4	0.05	0.19
P457	609.01	6	0.32	0.08	0.13
P459	312.63	6	0.34	0.04	0.13
P461	259.36	6	1.03	0.26	1.01
P463	66.59	6	0.03	0	0
P465	376.07	10	0.23	0.01	0.03
P467	311.1	10	0.28	0.02	0.05
P469	39.26	8	0	0	0
P47	334.66	10	0.32	0.02	0.06
P471	17.11	10	0.43	0	0.13
P473	24.63	4	0.04	0	0.01
P475	23.05	4	0.05	0	0.01
P477	460	8	0.37	0.05	0.11
P479	62.34	8	0.04	0	0
P481	303.75	4	0.21	0.04	0.12
P483	97.07	4	0.12	0	0.04
P485	10.76	4	0.06	0	0.02
P487	44.62	8	0.02	0	0
P489	75.35	8	0	0	0
P49	626.3	10	0.17	0.01	0.02
P491	161.45	4	0.06	0	0.01
P493	12.94	8	0.02	0	0.02
P495	512.42	12	2.78	1.45	2.83
P497	118.39	12	2.78	0.33	2.83
P501	186.61	12	0.03	0	0
P503	480.73	14	2.1	0.51	1.05
P51	545.57	4	0.85	0.87	1.59
P53	437.64	4	0.19	0.05	0.1
P543	339.26	10	0.06	0	0
P545	159.91	6	0.1	0	0.01
P547	104.75	6	0.09	0	0.01
P55	298.22	4	0.34	0.09	0.29
P551	675.35	10	1.21	0.51	0.75
P553	268.94	10	0.33	0.02	0.07
P555	328.15	6	0.02	0	0
P559	412.47	10	0.03	0	0
P563	742.3	10	0	0	0
P569	220.34	10	0	0	0
P57	916.7	4	0.45	0.45	0.49
P571	1,267.98	10	0	0	0
P59	31.96	4	0.72	0.04	1.18
P61	383.42	2	0.48	0.34	0.89

P63	378.93	4	0.63	0.35	0.93
P65	302.86	4	0.02	0	0
P67	277.78	4	0.25	0.05	0.16
P69	358.62	4	0.01	0	0
P71	314.6	6	0.61	0.14	0.45
P73	337.72	4	0.35	0.1	0.3
P75	3,091.61	10	0.94	1.45	0.47
P77	1,053.65	10	1.24	0.83	0.78
P79	877.9	10	1.39	0.85	0.97
P81	604.77	10	1.48	0.66	1.09
P83	942.13	10	2	2.52	2.67
P85	166.14	10	1.98	0.43	2.62
P87	605.42	10	1.94	1.53	2.53
P89	362.16	8	0.01	0	0
P91	2,745.69	6	0.23	0.17	0.06
P93	50.73	4	0.8	0.07	1.43
P95	607.34	4	0.33	0.17	0.28
P97	913.27	4	0.03	0	0
P99	37.06	8	0.05	0	0