2018 Water Facility Plan

Prepared for
City of Clark Fork, Idaho

October 2018

Prepared by
Parametrix

2018 Water Facility Plan

DRAFT

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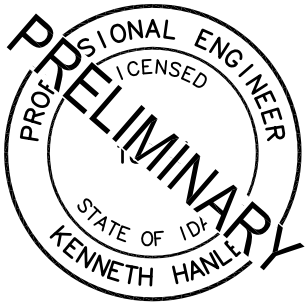
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CERTIFICATION

The technical material and data contained in this document were prepared under the supervision and direction of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below.



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KEY TERMS

ADD	average day demand
ALs	Action Limits
AWWA	American Water Works Association
BMPs	Best Management Practices
CCR	Consumer Confidence Report
CDBG	Community Development Block Grant
CFS	cubic feet per second
CIP	Capital Improvement Projects
City	City of Clark Fork
CP	commercial and public
CY	calendar year
DBPs	Disinfection byproducts
DEQ	Department of Environmental Quality
DOH	Department of Health
DS	Dead Storage
DWSRF	Drinking Water State Revolving Fund
EDU	equivalent dwelling units
EPA	Environmental Protection Agency
ES	Equalizing Storage
EWWP	Watershed Protection Program
FF	fire flow
fps	feet per second
FSS	Fire Suppression Storage
ft	feet
gpd	gallons per day
GPM	gallons per minute
HAA5	five haloacetic acids
IDAPA	Idaho Administrative Procedure Act
IDEQ	Idaho Department of Environmental Quality
IDL	Idaho Department of Lands
IWA	International Water Association
LCR	Lead and Copper Rule
LUSTs	leaking underground storage tanks
MCLs	Maximum Contaminant Levels
MDD	maximum day demand
MDL	method detection limit
MG	million gallons
mg/L	milligrams per liter

KEY TERMS (CONTINUED)

NAVD88 datum	North American Vertical Datum of 1988
NFA	No Further Action
NRCS	Natural Resource Conservation Service
OS	Operational Storage
OSHA	Occupational Safety and Health Administration
pCi/L	picocuries per liter
PHD	peak hourly demand
psi	pounds per square inch
PVC	polyvinyl chloride
RD	Rural Development
SB	Standby Storage
SDS	Safety Data Sheet
SF	single family
SWDA	Safe Drinking Water Act
TTHMs	total trihalomethanes
USGS	United States Geological Survey
WHPA	Wellhead Protection Area
WHPP	Wellhead Protection Program
WSM	Water Systems Management Inc.
WFP	water facility plan
µg/L	micrograms per liter

1. INTRODUCTION

1.1 Executive Summary

The City of Clark Fork (City) has a small municipal water system that has many components that are reaching the end of their design life, which is evident by the increased repairs and maintenance that the City has been required to perform to keep the system in operation. The general purpose of this facility plan is to evaluate the condition of the existing water system and to evaluate and develop priorities for the required system improvements based upon the greatest needs as well as cost and available funding.

The City chose Parametrix to work with them to help develop the facility plan as well as the environmental information document that will evaluate the impacts of the proposed improvements. The plan is being completed with a combination of funds from 3 different sources which include, a planning grant from Idaho Department of Environmental Quality, a planning grant from United States Department of Agriculture Rural Development, as well as matching funds from the City themselves.

The document is intended to serve as a planning document for immediate and long-term improvements to the City's water system as well as to identify the City's financial plan to fund these needs. This document as well as any proposed system improvements will follow the regulatory requirement set forth in the Idaho Administrative Code, section 58.01.08 – Idaho Rules for Public Drinking Water Systems. The document has been formatted to follow the Idaho Department of Environmental Quality Form 5-A outline, and to cover the requirements listed in the United States Department of Agriculture Rural Utilities Service Bulletin 1780-2.

1.2 Project Responsibility

The City has worked throughout the years to try and maintain their existing water system as best as possible given their available budget, but in recent years the system has started to show its age and the City accepted that they would again need to seek outside loans or funding opportunities to be able to make the necessary repairs and upgrades. The City currently has relatively low water rates, and does not have any outstanding loans on the water system, which will allow them to raise their rates to help pay for the required improvements and loan repayment fees. The City will also research and apply for any applicable grant funding which includes programs administered by agencies such as United States Department of Agriculture – Rural Development, and Idaho Community Development Block Grants.

The City contracts out the operation and maintenance of the existing system to a company that employs licensed water system operators who are on call. In addition to the qualified staff currently employed by the City, consultants and industry professionals are hired on an as needed basis to provide additional expertise and staff for larger or complex problems. Given the scale and complexity of the improvements and required projects for the water system, the City is anticipating hiring private consultants to manage the design and construction of the projects. The City will go through a rigorous screening and interview process to select a qualified engineer. The selection process will be structured to ensure that it meets all the requirements of the potential funding partners that the City plans to pursue.

2. EXISTING CONDITIONS

This section provides general information about the municipal water system owned and operated by the City of Clark Fork. Information is presented describing the history and development of Clark Fork's water system, the current ownership and management of the system, a system overview, related plans, and the system's existing service, retail service and future service areas.

2.1 System and Project Boundaries

The attached system map included in Appendix A-5 shows both the water system boundary and the project boundary. Given the scale of the improvements required within the system and the immediate need, we have broken projects up into three separate phases. Depending on the available funding and support of the community, the projects may be grouped together and built at the same time, these groups will be shown later in the Capital Improvements Section of the Plan. Figure 2-1 shows the service area boundary.

2.2 Environmental Conditions in Planning Area

The City of Clark Fork is in the narrow river gorge of the Clark Fork Valley on the southeast side of Lake Pend Oreille. The downtown area has an elevation of 2090 feet (ft) (United States Geological Survey [USGS]) above sea level. Elevations for the rest of the City vary from 2087 ft at the western edge near the Clark Fork River to 2140 ft at the northeastern end of the valley generally sloping in a westerly direction towards town. The City is bounded by Lightning Creek on the western edge and Mosquito Creek on the eastern edge.

According to the Koppen Climate Classification Clark Fork has a boreal climate experiencing warm summers and cold winters. Winter temperatures vary between 20 degrees to 40 degrees Fahrenheit, while receiving an average of 55 inches of precipitation of either rain or snow. Summer temperatures vary between 50 degrees to 90 degrees with 5 inches of precipitation falling as rainfall.

Per the Natural Resource Conservation Service (NRCS), the primary soil type near Clark Fork is Bonner Silt Loam. The Bonner series consists of very deep, well drained soils formed in glacial outwash material derived dominantly from granite, gneiss, and schist, with a mantle of volcanic ash and loess. These soils are on terraces and terrace escarpments. Permeability is moderate in the solum and rapid to very rapid in the underlying material. Due to these soil properties, they are classified as prime farmland, however, the City does not contain any protected farmlands per the NRCS.

Bonner soils are on terraces and terrace escarpments. Elevations range from 2,000 to 3,200 feet. Slope ranges from 0 to 15 percent on the terraces and 15 to 65 percent on the escarpments. These soils formed in glacial outwash material derived dominantly from granite, gneiss, and schist. They have a mantle of volcanic ash and loess.

Bonner soils are used for timber production, grazing, homesites, cropland, hay and pasture, recreation, and wildlife habitat. Natural vegetation is mainly grand fir, Douglas-fir, ponderosa pine, lodgepole pine, and western larch, with an understory of pine reedgrass, myrtle pachystima, baldhip rose, common snowberry, longtube twinflower, American trailplant, piper anemone, goldthread, sedge, and common princes pine.

The City is protected from the regulatory floodway of lightning creek by levees along the edge of the river. The FEMA flood map for this area is provided in Appendix B-4. Because of the City's proximity to

several rivers and waterways, there are also large areas of wetland classified as freshwater emergent wetland and freshwater forested/shrub wetland. The map from the U.S. Fish and Wildlife Service is provided in Appendix B-5.

The City's main water line from their tank and source crosses Lightning Creek along a cable bridge suspended via tensioning on either side of the river. During larger storm events, Lightning Creek can very quickly reach the top of the dike road that the western anchor is seated near. Frequently, trees upstream of this crossing will be swept down to the crossing and become tangled in the suspended pipeline, forcing maintenance personnel to have to disentangle the trees from the City's only water source.

Clark Fork, from which the City gets its name, bounds the City to the South and outlets into Lake Pond Oreille just West of the City. Much of the soils in the area are from natural deposition from the local rivers.

2.3 Ownership and Management

The City of Clark Fork water system is owned and operated by the City of Clark Fork and is Class DWD1 for distribution and a DWT1 for treatment. The water system owner and operator are as follows:

Owner:	City of Clark Fork 110 E 3rd Avenue Clark Fork, ID 83811
Operator:	Robert Hansen (Water System Operator) Jay Solomon (Water System Operator) Edward Huckaby (Water System Operator)
Phones:	(208) 265-4270 (Robert Hansen) (208) 266-1315 (City Hall)

The Idaho Department of Environmental Quality (IDEQ) water system identification number is ID1090018. Overall management of the City of Clark Fork's water system is performed by the Mayor and the City Council. One of the members of the City Council oversees the City's water system. This water system committee chair-person reports and/or makes recommendations to the Mayor and then reports are made to the City Council regarding their findings and/or recommendations. This person confers with the water systems treatment and distribution system operators to formulate recommendations to be presented to the Mayor and City Council regarding the water system. The Mayor and City Council may also request information or may assign tasks to the water system committee chair-person who reports back to the City Council and Mayor. Decisions regarding the water system are then made in an open public format during the monthly council meeting, and if necessary are formulated through the resolution process.



Figure 2-1. Municipal Service Area

2.4 System History and Background

The City of Clark Fork is in Bonner County approximately 45 miles north of Coeur d'Alene and 55 miles south of the Canadian border in north Idaho. The City of Clark Fork has provided water service to its residents since its incorporation in 1911. The City has two sources of drinking water from the Spring Creek well located approximately 2 miles north of the city limits and the 9th Ave well located at the western end of 9th Avenue. Before the water system improvements constructed in 1985, the City used a surface water diversion near the location of the present well site. The additional well at 9th Avenue is operated regularly and used as an emergency backup source for the system. The water is conveyed to the City limits from the pump house in a 16-inch wooden pipe of unknown condition. A steel distribution main was installed in the late 1930s to replace sections of the wooden pipe that had failed. In 1978 a new 15 hp pump station was built at the Spring Creek wellhead in addition to a 130,000-gallon concrete water reservoir. In 1986, another round of system improvements occurred which included replacing under capacity segments of the 4-inch distribution system, installation of water meters, replacement of the original fire hydrants, installation of a liquid propane backup generator for the pump station, and other piping and electrical improvements. Also in 1986, some of the wooden conveyance pipeline from the Spring Creek wellhead was replaced with steel water main.

The water distribution system consists of approx. 8.3 miles of pipes of varying types (polyvinyl chloride [PVC], steel, ductile iron, cast iron, and wood) and sizes (2-inches through 16-inches). Much of the City's distribution system is old – outside of the PVC main line. The City has isolation valves within the system, however these valves have not been accurately located for the purposes of this report, and an unknown number of them were not properly maintained and have seized up and are no longer operable.

2.5 System Overview and Inventory

2.5.1 Overview of System Operation

The Spring Creek Well consists of a 16-inch diameter casing that is 70 feet deep with a 15 hp Berkeley submersible pump. The well can produce 350 gallons per minute (GPM) and is controlled by a variable speed controller to minimize water hammer. Located on the discharge pipe in the well house is an 8-inch flow meter, gate valve, check valve, sample taps, pressure gauge, and flow measurement detector that activates the chlorinator, corrosion control systems and injectors for both sodium hypochlorite (liquid chlorine) and caustic soda 25 percent. Pumping to the storage tank is controlled by a level sensor located in the city's concete reservoir. When the water level falls to a preset elevation, the pump starts pumping into the system until the water level reaches "pump off" level in the reservoir.

2.5.2 System Inventory

The bulleted list below contains a brief system inventory highlighting the basic components of the system (refer to Chapter 4, Table 4-1 for a more comprehensive inventory). The City's existing water facilities are shown in Figure 2-2, and a larger version of this map is provided in Appendix A-5.

- One groundwater well at Spring Creek
- One groundwater well at 9th Avenue (Backup/Emergency)
- One 130,000 gallon concrete storage reservoir

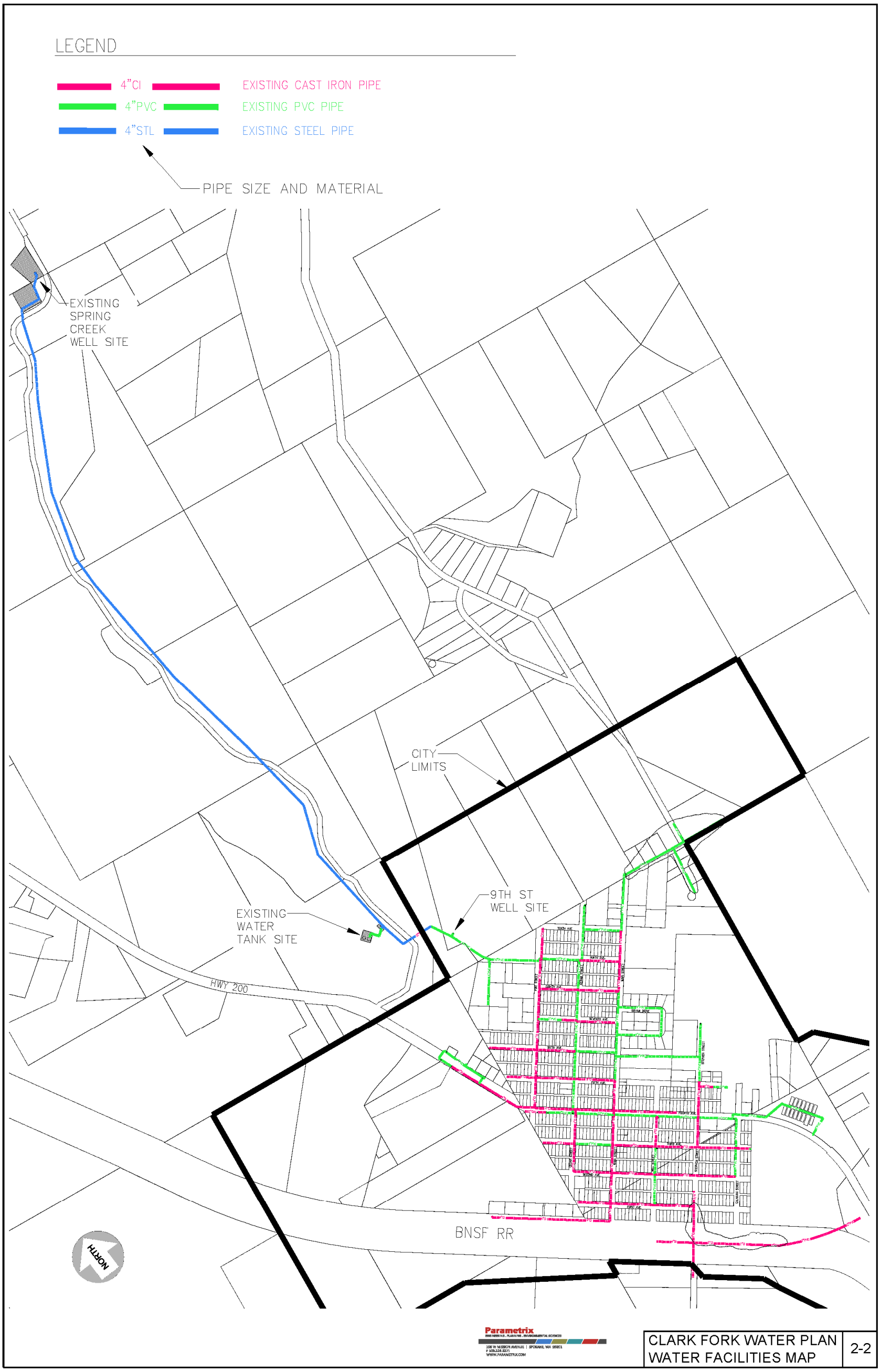


Figure 2-2. Existing Water Facilities

- one active 15 hp pump (Spring Creek Well)
- one active 30 hp pump (9th Avenue Well)
- A network of distribution pipes ranging in size from 2-inch to 16-inch diameter (8.3 miles) with approximately 282 active service connections
- Manual isolation valves[1]
- 42 Fire hydrants[2] within the downtown area
- Liquid chlorine disinfection (Spring Creek Well)
- Corrosion Control treatment (Spring Creek Well)
- Meters in the water treatment building, reservoir outlet and at most service connections

2.5.3 Cross Connection Control Program

The City of Clark Fork has a cross-connection control ordinance (Clark Fork Ordinance #251) which requires compliance with cross connection control requirements of Idaho Administrative Procedure Act (IDAPA) IDAPA 58.01.08 and lays out requirements for inspections, required installations, minimum backflow prevention devices and other parameters. A copy the City's Water Ordinance is contained in Appendix A. It is recommended that the City review the ordinance annually and make updates as needed to remain compliant with Idaho Code.

2.6 Existing Service Area

The existing service area (also known as the water rights place of use) is approximately 636 acres in size (see Figure 2-1) and is generally defined as the City limits. The City provides service to approximately 282 active service connections serving 570 people as described during the 2010 Census. The water system supports both residential and commercial buildings with potable water. Commercial buildings include a restaurant/bar, a gas station/convenience store and government entities such as the City hall, ball fields, park, cemetery, post office. There are no other municipal water systems within a reasonable distance such that an intertie might be made.

2.7 Future Service Area

The City has not shown any consistent growth in the available historical records, so for this planning document, no additional service areas are discussed nor anticipated outside of the undeveloped area in the current city limits.

[1] The water system operator noted that prior to his involvement, the valves within the system were not exercised consistently, and as a result are no longer operational. Any required maintenance for the system requires that large portions of the system be taken offline.

[2] Many hydrants are fed from undersized water mains.



Figure 2-3. Existing Service Area

2.8 Service Area Policies

The City of Clark Fork has water service area policies including provisions for metering, connection charges, cross connection control and design and developer standards. The City does have a policy requiring connection to the City's water system for residents desiring water service within city limits (see Ordinance No. 251 in Appendix A-3).

According to the Municipal Water Law, the City of Clark Fork's water system has a duty to serve new water service connections within the retail service area. The following conditions must be met for the City of Clark Fork to provide a new water service connection within its defined retail service area:

1. The water system must have sufficient capacity to serve water in a safe and reliable manner.
2. The service request shall be consistent with adopted local plans and development regulations.
3. The water system shall have sufficient water rights to provide service.
4. The water system must be able to provide service in a timely and reasonable manner.

To request new water service (a water service extension), an applicant must complete a City of Clark Fork water service application form. A copy of their application is then sent to city council, to review the application and determine whether the proposed extension conforms to the adopted Water System Plan. If the Committee decides there is not adequate infrastructure to support the requested water service, the applicant would be required to analyze the impact on the water system. If adequate infrastructure is not available, the applicant is so notified and, where possible, given the opportunity to construct the necessary additional infrastructure at their expense and in conformance with the City's design standards and specifications.

2.9 Water Rate Structure and Fees

The City of Clark Fork has adopted new water rates and fees to meet their financial requirements. These water rates were implemented in the summer of 2018 to assist the city in using water rates revenue to cover operation costs. The current adopted water rates are as follows (see Resolution 6-2018):

Residential: Base Rate: $24.78 per ¾" connection
User Charge: $1.89 per 1,000/gallons

Commercial: Base Rate: $36.76 (3/4" meter connection)
Base Rate: $44.69 (1" meter connection)
Base Rate: $121.95 (2" meter connection)
Base Rate: $304.87 (3" & 4" meter connection)
User Charge: $1.89 per 1,000/gallons

Therefore, if a 2-inch commercial user had a meter reading of 7,000 gallons in a one-month billing cycle, their bill would be ($121.95 + $13.23) $135.18. There is also a water connection charge based on the conditions of the following table. A reference for this table is found in the water rates ordinance in Appendix A-4.

Table 2-1. Water Service Connection Fee Schedule

Meter Size	Connection Fee
1” Residential/Commercial	$5,000
2” Residential/Commercial	$6,500
3” Residential/Commercial	$8,500
4” Residential/Commercial	$12,500
Up to 4” Fire connection	$8,500

3. PLANNING DATA AND WATER DEMAND

3.1 Introduction

This chapter discusses planning data and demand forecasts via three main sections. The first section summarizes historical and projected demographics for the City of Clark Fork. The second section summarizes historical supply characteristics including production, peaking factors, water balances, non-revenue water, leakage, and water use factors. The third section combines the demographics and water supply characteristics to develop a demand forecast for the six and twenty-year planning periods.

3.2 Demographics – Historical and Projected

The demographic data is comprised of two key elements: population and single-family households. Table 3-1 shows the historical and projected demographics from Census data years (1990, 2000, 2010) and 2014 to 2038. The table includes growth rates compared to the current 2016 numbers and annual growth rates based on the 2010 Census population estimate increase from 2014 to 2015 for Bonner County available from the Idaho Department of Labor, which is 0.37 percent. This annual growth rate was applied to all plan years for single family residences (SF), commercial and public occupied areas (CP) and to the population of the City of Clark Fork. The demographics were developed using this annual growth rate for the six plan years of 2019 thru 2024 and then also applied to the long-range plan years of 2024 to 2038 (see footnotes to Table 3-1).

The estimated current population inside the service area in 2019 is 549 and is expected to increase to 559 by the end of the 6-year planning period in 2024 and increase to 589 by the end of the 20-year planning period in 2039. The resulting increase over the 2016 population during the 20-year planning period is estimated to be 7.2 percent. The City of Clark Fork has expressed that their intent and desires are to maintain the current population well into the future and not experience a decline in population, as was the case in recent years.

The number of single family households in 2017 is based on the number of active residential water service meters which was determined to be 229 from data provided by the City of Clark Fork. The number of residential water service meters is conservatively estimated to increase to 235 by the end of the 6-year planning period in 2024, and then increase to 248 by the end of the 20-year planning period in 2038. The resulting increase over the 2016 number of single family households during the 20-year planning period is estimated to be 8.3 percent.

The estimated current number of commercial and public occupied areas in 2017 is 52 and is expected to increase to 53 by the end of the 6-year planning period in 2024 and possibly increase to 57 by the end of the 20-year planning period in 2038. The resulting increase over the 2017 number of commercial and public occupied areas during the 20-year planning period is estimated at 9.6 percent since the same annual increase of 0.37 percent has been applied to all the plan years for estimating the potential increase in population, number of single family households and the number of commercial and public occupied areas.

Table 3-1. Historical and Projected Demographics

Calendar Year[1]	Plan Year	Single Family (SF) Households			Population inside the water service area[4]			Commercial and Public (CP) Occupied Areas[5]		
		Quantity[2]	% Increase Over 2010	Annual Increase[3]	Quantity	% Increase Over 2010	Annual Increase[3]	Quantity	% Increase Over 2010	Annual Increase[3]
1990	n/a	188	n/a	n/a	448	n/a	n/a	n/a	n/a	n/a
2000	n/a	223	n/a	n/a	530	n/a	1.83%	n/a	n/a	n/a
2010	n/a	226	n/a	n/a	537	n/a	1.32%	51	n/a	n/a
2014	n/a	226	n/a	n/a	539	n/a	0.37%	51	n/a	n/a
2015	n/a	227	0.74%	0.37%	541	0.74%	0.37%	52	0.7%	0.37%
2016	n/a	228	1.11%	0.37%	543	1.12%	0.37%	52	1.1%	0.37%
2017	n/a	229	1.47%	0.37%	545	1.49%	0.37%	52	1.5%	0.37%
2018	n/a	230	1.87%	0.37%	547	1.87%	0.37%	52	1.9%	0.37%
2019	1	231	2.24%	0.37%	549	2.24%	0.37%	52	2.2%	0.37%
2020	2	232	2.62%	0.37%	551	2.62%	0.37%	53	2.6%	0.37%
2021	3	232	3.00%	0.37%	553	3.00%	0.37%	53	3.0%	0.37%
2022	4	233	3.38%	0.37%	555	3.38%	0.37%	53	3.4%	0.37%
2023	5	234	3.76%	0.37%	557	3.76%	0.37%	53	3.8%	0.37%
2024	6	235	4.15%	0.37%	559	4.15%	0.37%	53	4.1%	0.37%
2025	7	236	4.53%	0.37%	561	4.53%	0.37%	54	4.5%	0.37%
2026	8	237	4.92%	0.37%	563	4.92%	0.37%	54	4.9%	0.37%
2027	9	238	5.31%	0.37%	566	5.31%	0.37%	54	5.3%	0.37%
2028	10	239	5.70%	0.37%	568	5.70%	0.37%	54	5.7%	0.37%
2029	11	239	6.09%	0.37%	570	6.09%	0.37%	54	6.1%	0.37%
2030	12	240	6.48%	0.37%	572	6.48%	0.37%	55	6.5%	0.37%
2031	13	241	6.88%	0.37%	574	6.88%	0.37%	55	6.9%	0.37%
2032	14	242	7.27%	0.37%	576	7.27%	0.37%	55	7.3%	0.37%
2033	15	243	7.67%	0.37%	578	7.67%	0.37%	55	7.7%	0.37%
2034	16	244	8.07%	0.37%	580	8.07%	0.37%	55	8.1%	0.37%
2035	17	245	8.47%	0.37%	582	8.47%	0.37%	56	8.5%	0.37%
2036	18	246	8.87%	0.37%	585	8.87%	0.37%	56	8.9%	0.37%
2037	19	247	9.27%	0.37%	587	9.27%	0.37%	56	9.3%	0.37%
2038	20	247	9.68%	0.37%	589	9.68%	0.37%	56	9.7%	0.37%

1. Calendar years prior to 2015 are Census data years.
2. Quantity of single family households is from Census data for years prior to 2015. Quantity of single family households for 2015 is based on the number of active residential water meters.
3. The annual percentage increase for 2015 and beyond is from the Idaho Labor Market Information Website. The LMI provided an estimated change in population from 2010 to 2015 for the City of Clark Fork which was applied to all plan years.
4. Population is from Census data for years prior to 2015.
5. CP = Commercial and Public occupied areas includes commercial (industrial and non-industrial) and government agencies (Post Office & City Hall etc.).

3.3 Water Use Characteristics

3.3.1 Production and Peaking Factor

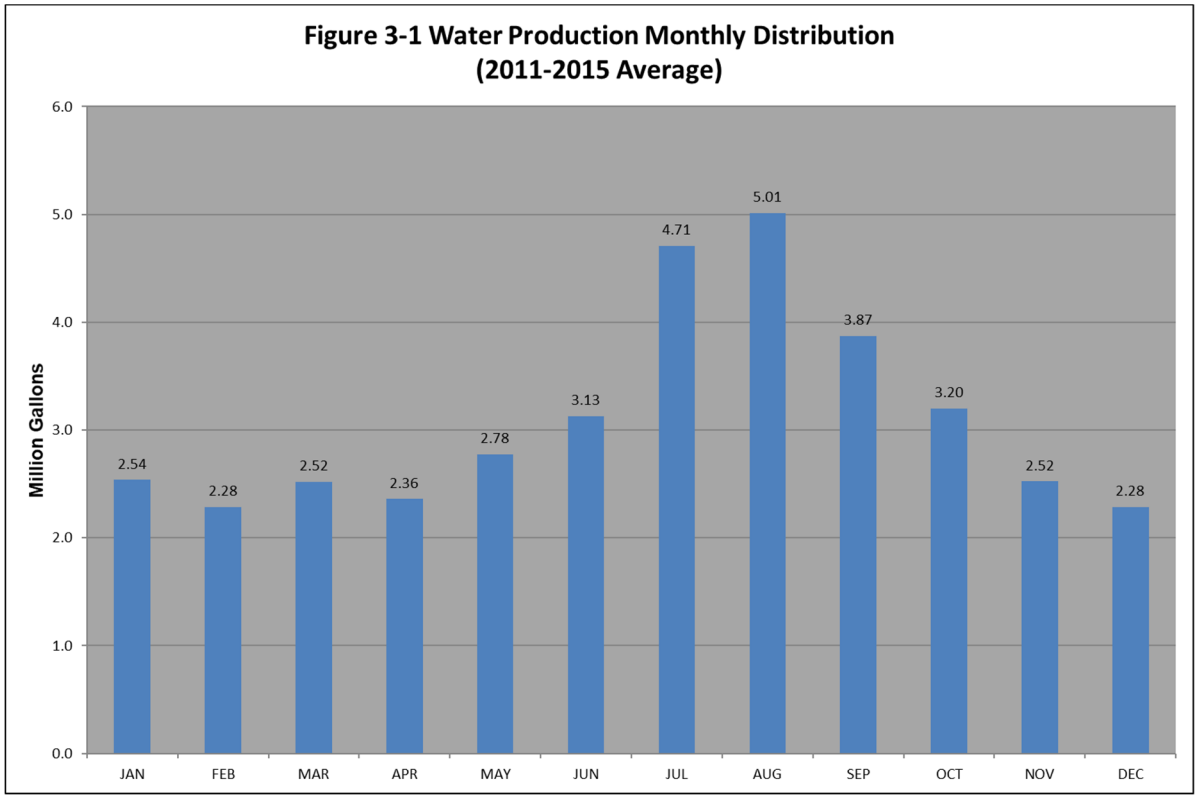
The City of Clark Fork currently produces water from one source, the well near Spring Creek. Table 3-2 shows the average production by month over the last five years (2011-2015). The total average annual production has been just less than 38 million gallons. As is typical with most water utilities, production peaks in the summer months of July through August due to increased outdoor water usage like irrigation. Figure 3-1 shows this same production information graphically. The last column on the right in Table 3-2 shows for a given year how the water usage might be allocated for any month.

Table 3-2. Water Production 2011-2015 Million Gallons (MG)

Month	2011	2012	2013	2014	2015	Average	Percent
JAN	2.41	2.15	3.48	3.35	1.30	2.54	7%
FEB	2.05	2.13	2.96	3.18	1.10	2.28	6%
MAR	2.25	2.35	3.33	3.30	1.37	2.52	7%
APR	2.19	2.17	3.21	3.09	1.14	2.36	6%
MAY	2.44	2.41	3.62	3.37	2.04	2.78	7%
JUN	2.68	2.18	3.28	3.40	4.09	3.13	8%
JUL	4.16	3.75	5.24	5.39	5.00	4.71	13%
AUG	5.74	4.32	5.14	4.89	4.96	5.01	13%
SEP	4.56	3.36	3.97	4.07	3.38	3.87	10%
OCT	2.65	3.48	2.76	3.38	3.74	3.20	9%
NOV	2.54	2.11	2.82	2.14	3.01	2.52	7%
DEC	2.57	2.77	3.30	1.59	1.20	2.28	6%
Total	**36.24**	**33.16**	**43.10**	**41.17**	**32.33**	**37.20**	**100%**

MG = Million gallons.

Data Source: City of Clark Fork's water treatment plant production reports.



Data Source: City of Clark Fork plant production reports.

Figure 3-1. Water Production Monthly Distribution

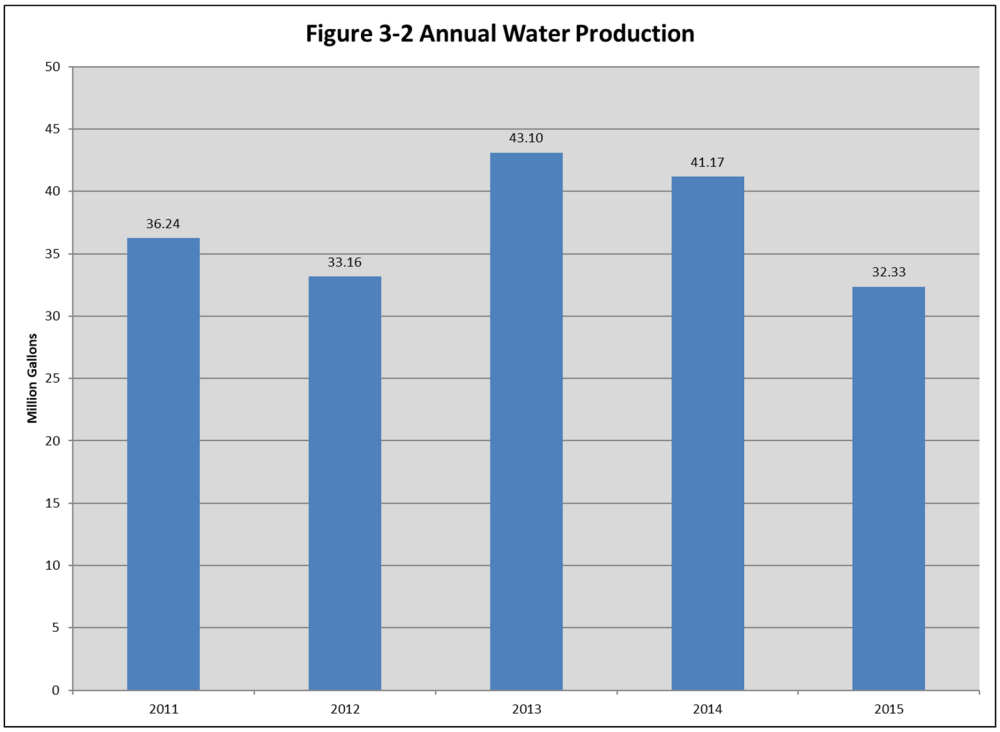
The annual production data and peaking factors from 2011 through 2015 are shown in Table 3-3. Water production as shown in the table below has not been constant for the last several years. The reason for this fluctuation is that the system is showing its age and more leaks are appearing throughout the system. The City has been repairing these leaks when they are found.

Table 3-3. Water Production Summary 2011-2015

Year	Annual (MG)[1]	Annual Change	Average Day (MG)	Maximum Day[1] MG[2]	Maximum Day[1] Date	MDD Peaking Factor
2011	36.24	NA	0.0993	N/A	N/A	
2012	33.16	-8.5%	0.0909	N/A	N/A	
2013	43.10	30%	0.118	N/A	N/A	
2014	41.17	-4.5%	0.113	N/A	N/A	
2015	32.33	-18.5%	0.0919	0.0255	8/11/15	2.8
2011-2015 Average	**37.20**	**-1.125%**	**0.1012**	**0.0255**	**N/A**	**2.7[2]**

1. Data Source: City of Clark Forks water treatment plant production reports.
2. The only available daily records are from 2015, so the peaking factor was developed based on the available data.

The annual total water production data for the years 2011 thru 2015 is shown in Figure 3-2. There does not appear to be a trend that is identifiable from the data. It appears that leaks in the system caused an increase of 25 percent over the historical data and by 2015 the data returned to the previous production levels.



Data Source: Water treatment plant production reports – City of Clark Fork

Figure 3-2. Annual Water Production

3.3.2 Customer Categories

The City of Clark Fork has essentially two customer categories. While the City does not have formal definitions of these categories, below are general understandings of each customer category:

Residential: Detached residential buildings serving a single family.

Commercial and Occupied Public Areas: Business customers engaged in industrial and non-industrial activities, public entities such as schools, churches and City Hall.

The meter data was divided into the separate uses by using the name of the account holder listed on meter data, Bonner County assessor data or by street view from Google Earth. There are 281 metered service connections in the City of Clark Fork (see Appendix C). Currently, of the 281 metered connections 229 of them are residential connections and 52 of them are commercial and occupied public area connections. Of the 52 commercial and public properties, 6 displayed significant increases in water usage during summer months for irrigation. These six were broken out into a separate commercial category as shown below. Annual water usage by customer category is provided below in Table 3-4 for the portions of 2015 as provided by the City.

Table 3-4. Water Service Meter Usage

Meter Reading Intervals (million gallons per interval reading)

	6-1 2015 to 6-29 2015 (28 days)		6-30 2015 to 9-1-2015 (63 days)		9-2 2015 to 9-30-2015 (28 days)		10-01 2015 to 1-5-2016 (96 days)			Category Usage Total	
Customer Category	**Active Connec-tions**	**Daily Usage***	**Active Connec-tions**	**Daily Usage***	**Active Connec-tions**	**Daily Usage***	**Active Connec-tions**	**Daily Usage***	**Interval Average per Day**	**(6-1-15 thru 1-5-16)**	**% of Total**
Residential	230	0.1011	230	0.0826	230	0.0338	229	0.0273	0.050	10.80	62%
Comm. Non-Irrigated	46	0.017	46	0.012	46	0.009	46	0.005	0.0087	1.88	11%
Comm. w/Irrigation	6	0.026	6	0.0343	6	0.0284	6	0.000	0.00257	4.70*	27%
Interval Total	**282**	**4.029**	**282**	**8.116**	**282**	**1.981**	**281**	**3.23**	**n/a**	**17.38**	**100%**

*Based on 160 days during the summer months.

3.3.3 Water Balance, Non-Revenue and Leakage

Table 3-5 shows the City of Clark Fork's water balance for six months (June 2015 - January 2016) based on the available water meter reading data and usage summary as provided in Appendix C. This represents all the available meter data from the City to date. The table format is a modified version of a format developed by the International Water Association (IWA) and recommended for use by the American Water Works Association (AWWA) Water Loss Committee.

Table 3-5. Water Balance (June 1, 2015 – Dec 31, 2015)

	Category Method A	Category Method B	Category Method C	Volume (MG)	% of Water Produced
Water Produced	1. Accounted Water Uses	1. Authorized Consumption	1. Water Exported	0	0.0%
			2. Metered Consumption	17.356	68.40%
			3. Un-metered Consumption	0.0	0.0%
	2. Unaccounted Water Uses	2. Real Losses	4. Known Main Leakage	0.0	0.0%
			5. Known Service Connection Leakage	0.0	0.0%
			6. Known Storage Leakage/Overflows	0.0	0.0%
			7. Assumed Leakage*	8.017	31.60%
			Total Production:	**25.37**	**100.00%**

*all non-billed water usage is assumed to be leakage.

The following categories are useful in identifying potential additional system improvements and identifying the magnitude of leaks that could be fixed:

Un-Metered Authorized Consumption: Includes uses such as water system flushing, government irrigation, firefighting, and government use. Typically, it is standard practice not to charge for uses falling into this sub-category. However, reviewing these uses to ensure a legitimate revenue opportunity is not missed is always a prudent idea.

Real Losses: Includes various types of system leaks. A certain level of leaks is unavoidable; however, leaks should be fixed to not unduly burden both the natural resource and the physical infrastructure. Under the IWA's protocol; any amount that cannot be assigned to another category is considered a real loss. The City's real losses are estimated at 31.60 percent. This number represents a real and significant financial cost to the City as the water is pumped, treated and stored only to disappear in the distribution lines. Typically, industry standards suggest losses over 15 percent should be addressed by leak detection and repair programs.

3.3.4 Water Use Factors and EDUs

Water use factors were calculated for two customer categories: SF and CP which is the combination of two customer categories; commercial and government facilities (i.e., post office, City Hall, etc.). Table 3-6 shows the details for the water use factor calculations. See Section 3.4.2 for an explanation of how these categories were created.

Table 3-6. Water Use Factors (2015-2016 Average)

Customer Category	Quantity (gpd)	Metered Service Connections	Number of Households	Avg. Day Demand (gpd)		Number of EDU's[1]
				Per Connection	Per Household	
Single Family (SF)	49,886	229	229	239	239	229
Comm. Non Irrigated.	8,686	46	N/A	189	N/A	36
Comm. w/Irrigation	2,570	6	N/A	428	N/A	11
Non-Revenue	21,920	1	N/A	21.920	N/A	91
					Total	**367**

1. EDUs, or equivalent dwelling units, are a method of representing water use by non-residential categories as an equivalent number of residential customers. An EDU can be thought of as the amount of water used by a single family household.

3.4 Demand Forecast

3.4.1 Demand Forecast Results (without conservation)

The demand forecast for the average day demand (ADD) is expected to increase to 94,844 gpd by the end of the 6-year planning period in 2024, and increase to 98,954 gpd by the end of the 20-year planning period in 2038. The maximum day demand (MDD) forecast is expected to increase to 265,564 gpd by the end of the 6-year planning period in 2024, and increase to 277,072 gpd by the end of the 20-year planning period in 2038 based on utilizing the average peaking factor of 2.8 (see Table 3-3). The historical and projected demand is shown in Table 3-7 without any conservation.

Table 3-7. Historical and Projected Water Demand (without conservation)

		Demographics[1]		Water Use Factors (EDU)[2]		Demand					
						Average Day Demand (ADD gpd)					
Calendar Year	Plan Year	Single Family (SF) Household	Commercial & Public (CP) Occupied Areas	Per SF	Per CP	SF[3]	CP[4]	Sub-total[6]	Non-Revenue[7]	Total[8]	Maximum Day Demand (MDD gpd)[9]
1990	n/a	188	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2000	n/a	223	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2010	n/a	226	51	239	309	53,930	15,832	69,761	21,920	91,681	256,708
2014	n/a	226	51	239	309	54,131	15,891	70,021	21,920	91,941	257,435
2015	n/a	227	52	239	309	54,331	15,949	70,280	21,920	92,200	258,161
2016	n/a	228	52	239	309	54,532	16,008	70,540	21,920	92,460	258,889
2017	n/a	229	52	239	309	54,734	16,068	70,801	21,920	92,721	259,620
2018	n/a	230	52	239	309	54,936	16,127	71,063	21,920	92,983	260,353
2019	1	231	52	239	309	55,139	16,187	71,326	21,920	93,246	261,089
2020	2	232	53	239	309	55,343	16,247	71,590	21,920	93,510	261,828
2021	3	232	53	239	309	55,548	16,307	71,855	21,920	93,775	262,570
2022	4	233	53	239	309	55,754	16,367	72,121	21,920	94,041	263,314
2023	5	234	53	239	309	55,960	16,428	72,388	21,920	94,308	264,062
2024	6	235	53	239	309	56,167	16,488	72,656	21,920	94,576	264,812
2025	7	236	54	239	309	56,375	16,549	72,924	21,920	94,844	265,564
2026	8	237	54	239	309	56,583	16,611	73,194	21,920	95,114	266,320
2027	9	238	54	239	309	56,793	16,672	73,465	21,920	95,385	267,078

(Table Continues)

Table 3-7. Historical and Projected Water Demand (without conservation) (Continued)

		Demographics[1]		Water Use Factors (EDU)[2]		Demand					
						Average Day Demand (ADD gpd)					
Calendar Year	Plan Year	Single Family (SF) Household	Commercial & Public (CP) Occupied Areas	Per SF	Per CP	SF[3]	CP[4]	Sub-total[6]	Non-Revenue[7]	Total[8]	Maximum Day Demand (MDD gpd)[9]
2028	10	239	54	239	309	57,003	16,734	73,737	21,920	95,657	267,839
2029	11	239	54	239	309	57,214	16,796	74,010	21,920	95,930	268,603
2030	12	240	55	239	309	57,426	16,858	74,284	21,920	96,204	269,370
2031	13	241	55	239	309	57,638	16,920	74,558	21,920	96,478	270,139
2032	14	242	55	239	309	57,851	16,983	74,834	21,920	96,754	270,912
2033	15	243	55	239	309	58,065	17,046	75,111	21,920	97,031	271,687
2034	16	244	55	239	309	58,280	17,109	75,389	21,920	97,309	272,465
2035	17	245	56	239	309	58,496	17,172	75,668	21,920	97,588	273,246
2036	18	246	56	239	309	58,712	17,236	75,948	21,920	97,868	274,030
2037	19	247	56	239	309	58,929	17,300	76,229	21,920	98,149	274,817
2038	20	248	56	239	309	59,147	17,364	76,511	21,920	98,431	275,607

1. See Table 3-1 for details on how these numbers were generated.
2. See Table 3-6 for details on how these numbers were generated.
3. The number of single family households multiplied by the water use per single family household.
4. The number of multifamily households multiplied by the water use per multifamily household.
5. The number of CP occupied acres multiplied by the water use per CP occupied areas.
6. The sum of the SF, MF, and CP demands.
7. Non-Revenue water is pumped but not billed.
8. The subtotal of the SF, MF, and CP demands plus the non-revenue water.
9. The total average day demand multiplied by a peaking factor of 2.8 which is the 2015 peaking factor (see Table 3-3).

Figure 3-3 shows ADD and MDD without conservation graphically. Figure 3-4 shows ADD without conservation graphically. The three components of the ADD (single family; commercial/public occupied areas and non-revenue) are presented so that it is easy to comprehend the relative impact of each component.

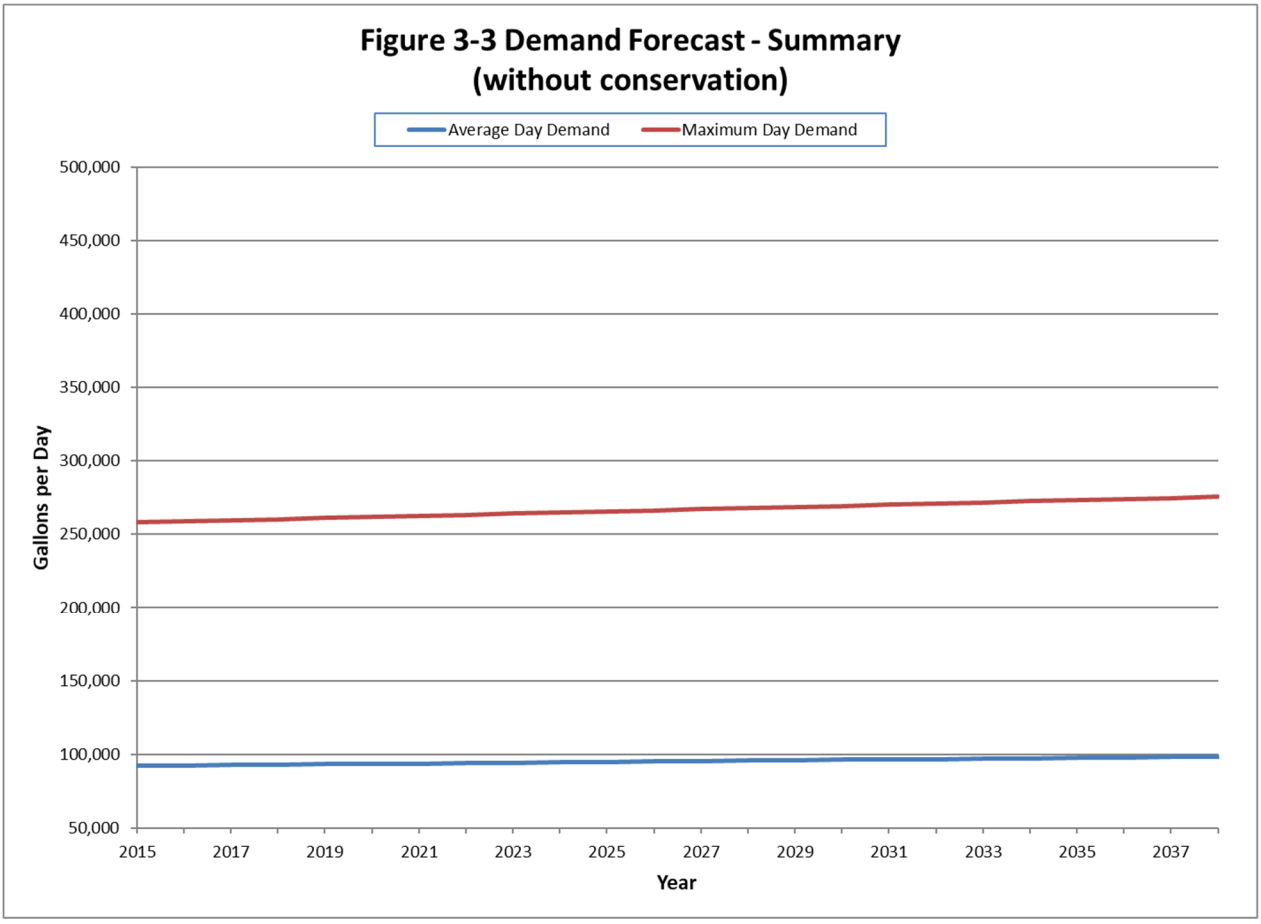


Figure 3-3. Demand Forecast Summary

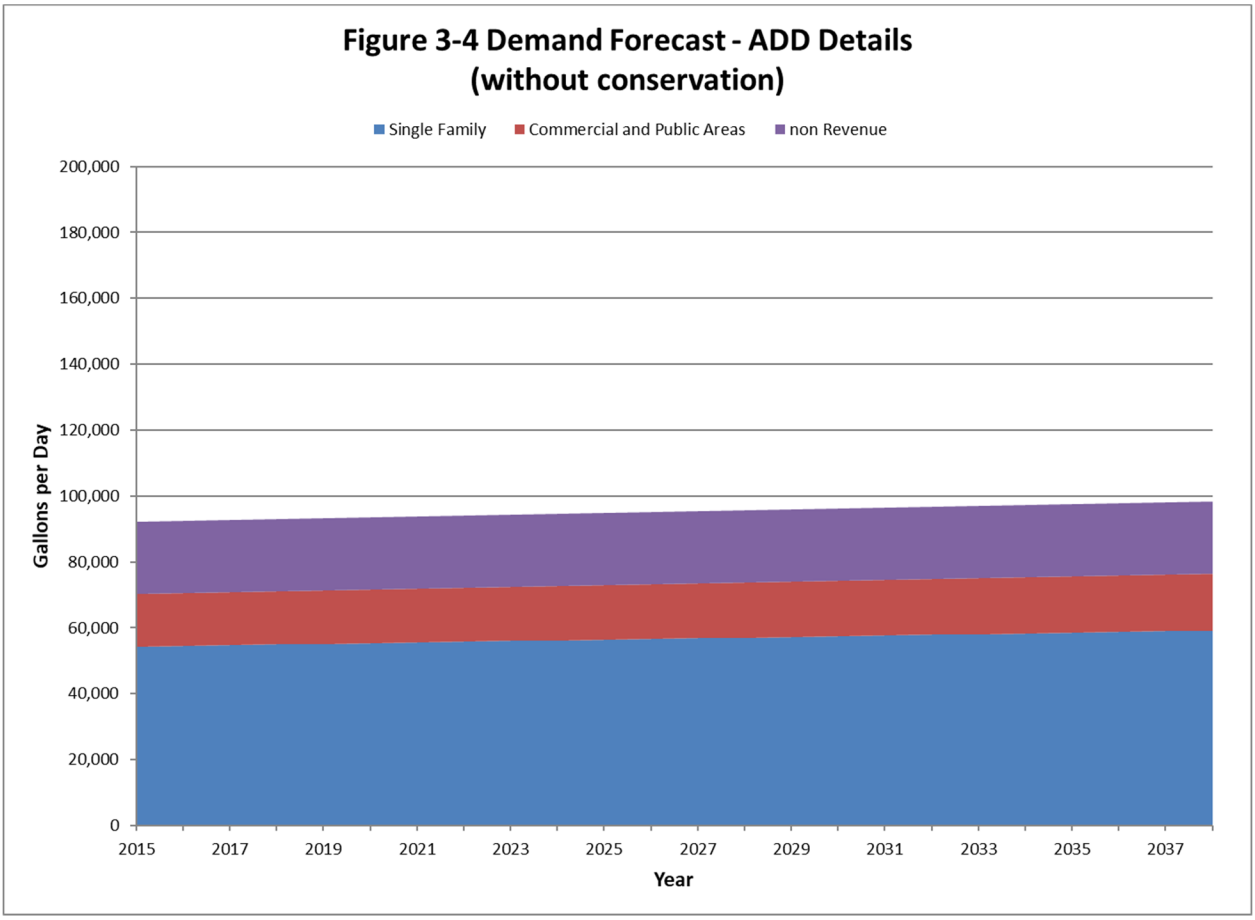


Figure 3-4. Demand Forecast (ADD) Details

3.4.2 Demand Forecast Methodology

The process for projecting water demand involved the following seven steps:

Step 1 Demographic Projections: Demographic projections were generated according to the process described in Section 3.2.

Step 2 Water Use Factors: Water use factors were calculated according to the process described in Section 3.3.4.

Step 3 Demand for Metered Water: The demographics projections (from Step 1) were multiplied by the water use factors (from Step 2) to get the demand for the single family and commercial/public areas. For example, in 2022 the 233 single family households were multiplied by the water use factor of 239 gpd to result in 55,754 gpd average day demand for the single family household category.

Step 4 Non-Revenue Demand: The amount of non-revenue water accounts for the non-revenue water shown on Table 3-5. The percentage is derived by dividing the assumed leakage (8 mg) by 365 to determine how much is lost daily.

Step 5 Average Day Demand: The system total average day demand was calculated by adding the demands for single family and commercial/occupied areas; and non-revenue water. For example, in 2022 the 55,754 gpd in single family, 16,367 gpd in commercial/public areas and 21,920 gpd in non-revenue water were added to total an average day demand of 94,041 gpd.

Step 6 Maximum Day Demand: The system total maximum day demand was calculated by multiplying the ADD by the 2.80 peaking factor from Table 3-3. For example, in 2022 the average day demand system total of 94,041 gpd is multiplied by 2.80 to arrive at a system maximum day demand of 263,314 gpd.

Step 7 Conservation: The methodology outlined in Steps 1 through 6 above creates a baseline demand forecast that does not reflect any conservation. A discussion of the City's Conservation Program is presented in Chapter 5.

4. SYSTEM ANALYSIS

4.1 System Analysis Standards

This section will analyze the source, storage and distribution requirements of the system over a 20-year planning period to determine if the system meets IDEQ requirements. The governing fire authority, the City of Clark Fork Fire Department was contacted to confirm fire flow requirements for the water system. The fire flow requirements have been analyzed and are presented in the following sections. Source and storage regulatory requirements are presented below in Table 4-1.

Table 4-1. Source and Storage Requirements

Requirement	IDAPA 58.01.08 Citation	Description
Groundwater Source Redundancy	501.17	Under normal operating conditions, with any source out of service, the remaining source(s) shall be capable of providing either peak hour demand (PHD) of the system or a minimum of the MDD plus equalization storage.
Reservoir Capacities	544.01 & 003.15	Storage facilities shall have sufficient capacity, as determined from engineering studies that consider peak flows, fire flow capacity, and analysis of the need for various components of finished storage as defined under the term “Components of Finished Water Storage” in Section 003.
Emergency Operation	501.07	During a power outage, the water system shall be able to meet the operating pressure requirements of Subsection 552.01.b. for a minimum of eight (8) hours at average day demand plus fire flow where provided.

4.2 System Inventory

A system inventory was performed from as-built construction drawings, information provided to Parametrix by the City and water system maintenance staff. Table 4-2 is a listing of the system components and capacities.

A hydraulic profile of the water system is provided in Figure 4-1 that illustrates the components listed in Table 4-2. The figure presents a visual representation of how the components work together as a complete water system and the individual pressure zones. Figure 4-1 also shows the hydraulic profile of the system with reservoir levels reflecting the current fire storage requirements.

Table 4-2. Water System Components

System	Component	Description	
Source	Groundwater Well at Spring Creek	Date Constructed:	Upgrades completed in 1985
		Static Water Level:	2188.5± (varies based on Spring Creek elevation)
		Source Output:	350 gpm (approx.)
		Source Location:	Spring Creek Road, Clark Fork, ID
	Groundwater Well at 9th Avenue (backup/emergency	Date Constructed:	Completed in 1978
		Static Water Level:	2103± (based on well records)
		Source Output:	300 gpm (approx.)
		Source Location:	9th Avenue, Clark Fork, ID
Storage	Concrete Reservoir	Date Constructed:	1978
		Diameter:	35.1’
		Height:	18.5’
		Construction Type:	Concrete w/fusion bonded RPP liner (1997)
		Base Elevation:	~2210
		Overflow elevation:	~2227.25
		Volume:	130,000 gallons
		Pressure zone served:	Gravity
		Location:	Spring Creek Road, Clark Fork, ID
Treatment	Chlorine Injection	Date Constructed:	1978
		Corrosion Control:	LMI metering pump injecting sodium hydroxide
		Disinfection:	LMI metering pump injecting liquid chlorine
		Location:	Spring Creek Road, Clark Fork, ID
Distribution	Water Main Piping (approx. pipe lengths)	2" Steel: 6,613 LF 2” PVC: 2,557 LF 4" Steel: 15,501 LF 4” PVC: 4,303 LF 6" Steel: 810 LF 6” PVC: 2,384 LF 8" Steel: 1,288 LF 8” PVC: 2,413 LF 10” PVC: 5,220 LF 12” Steel: 7,647 LF 14” Steel: 22 LF 16” Wood: Unknown Total: 43,821LF	
Pressure Zone	Gravity Zone	The zone is fed by gravity from the reservoir and serves all areas within the City service area.	

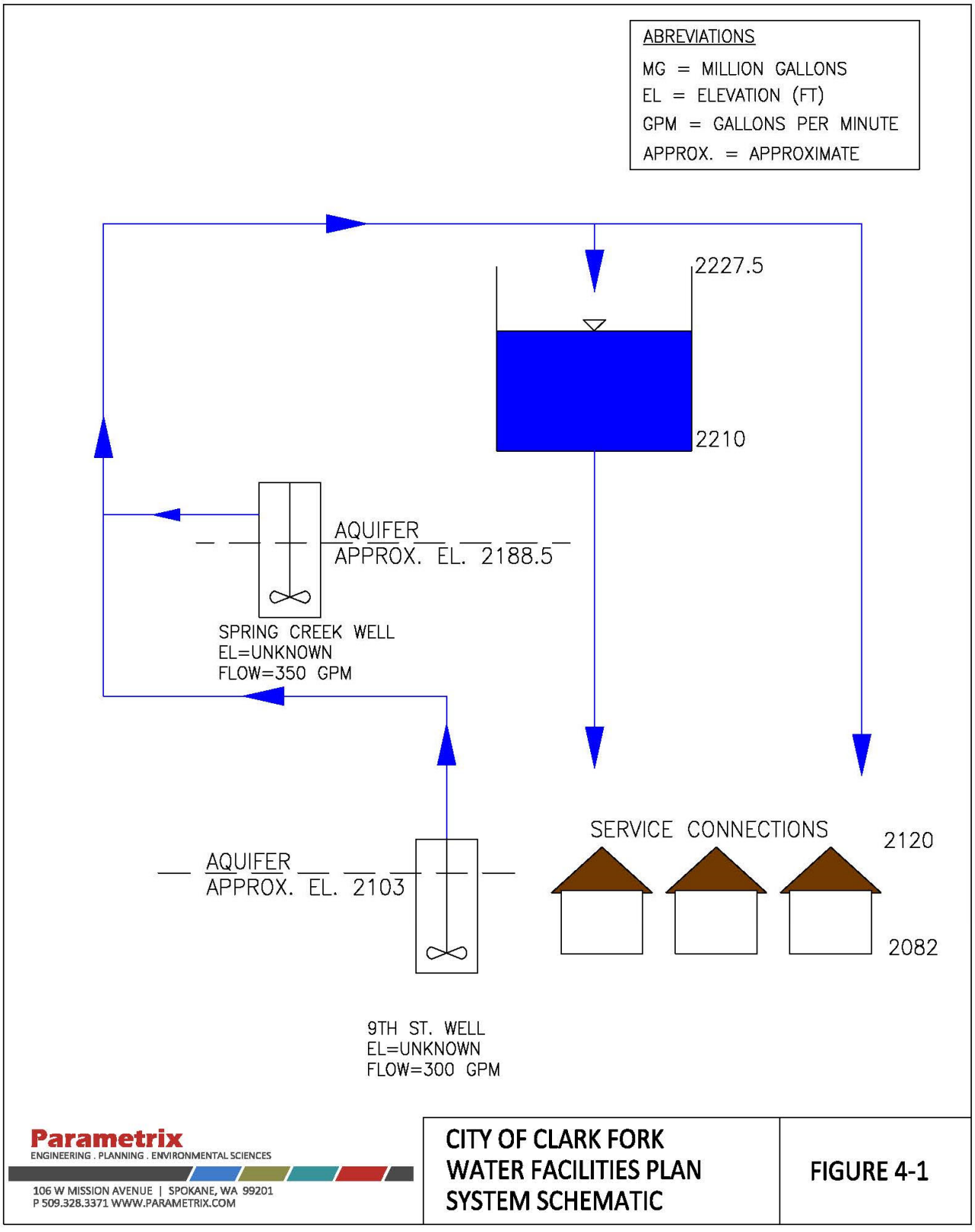


Figure 4-1. Water System Schematic

4.3 Hydraulic Analysis

4.3.1 Methodology

The City of Clark Fork's water system was analyzed using Bentley WaterCad Version 8i hydraulic modeling software. A "steady state" modeling approach was used to analyze the system, which is allowed for system planning purposes by the IDAPA.

Due to the condition of the existing systems pipes, no existing modeling was performed. The existing pipes have considerable scaling that, where repairs have been made, show significant restrictions to the diameters of the pipes. Due to this, some pipes that may have had an initial internal diameter of 6 inches have been constricted down to 4 or even 2 inches in areas. Because this would introduce significant error into the analyses herein, the system was modeled at the 6-year and 20-year planning periods assuming significant measures will be made in this period and assuming that there was no scaling in pipes. For this hydraulic analysis method to be representative, the City will need to make significant changes to their rate structure as this may require replacing nearly all pipelines that are not currently PVC, as well as constructing new storage and sources of supply. Figure 4-2 shows an example pipeline that was replaced within the City.



Figure 4-2. Pipeline Cross Section Showing Scaling

The current demands and population data were provided by the City. The 6-year and 20-year projections in the water model were determined by converting population growth data to demand growth.

To set up the model, available information regarding the pipe materials and diameters in the existing system was gathered from the City. Elevations of individual nodes in the system were determined using Google Earth. Tank elevations used in the model were provided by the City and are assumed to be accurate. Without a relevant pump curve, a flow rate of 300 GPM was assumed to be provided to the system by the Spring Creek well. Unit demands were assigned to nodes by analyzing how many residential and commercial units are serviced by each node. The unit demands were distributed throughout the system after determining the quantity of equivalent dwelling units (EDU) using the average daily demand (ADD) of the City. Multipliers were determined by matching the flows for each scenario to the peak flows shown in Table 4-3.

The model includes simulations for base year, 6-year, and 20-year conditions for both fire flow and steady state flow. Fire flow simulations were ran using MDD, and steady flow conditions were simulated by using the peak hourly demand (PHD). Pipe, well, and storage upgrades needed in the system for the 6-year and 20-year plan were determined by running base year fire flow and PHD simulations, and locating where required pressures and flows were not met. The 20-year plan includes upgrades needed to have no nodes below the required 1,000 GPM for fire flow.

The existing main source, the Spring Creek well, was assumed to be no longer used and separate from the rest of the system, but still available in the event of an emergency. The new main source will be the 9th Avenue well, but the flow was assumed to remain at 300 GPM.

To meet the fire flow requirements for the City, a flow rate of 1,500 GPM must be available for 2 hours resulting in a required volume of 180,000 gallons. Thus, a standard sized storage tank with the capacity to hold more than 180,000 gallons was modeled adjacent to the existing tank. The bottom elevation of the proposed storage tank is assumed to be the same as the existing storage tank.

The system upgrades proposed in the 6-year and 20-year plan were developed through communication with the City. Per the demands of the City, long dead-end pipes shall be looped, pipes with small diameters shall be replaced, cast-iron pipes shall be replaced, and isolation valves will be replaced. All cast-iron pipes are to be replaced by the 20-year plan period.

4.3.2 System Components

The WaterCad hydraulic model for the City of Clark Fork water system consists of 152 junctions, 201 pipes, 1 reservoir, and one well representing actual system physical and operational characteristics for the existing system as shown in Table 4-2. The most crucial requirement of system hydraulic modeling is the condition of MDD plus fire flow. Sizes and lengths of pipes and storage tank capacities were determined based on available existing system information, as-built construction drawings, and site visits. Storage tank operational elevations (treatment building pump on and pump off elevations) were obtained from the water treatment system operator and available as built plans. Elevations of pipe network junctions were determined based on available elevations from Google Earth.

The City's water system consists of one pressure zone, a gravity zone, which is served by the storage tank. The water tank sits on top of a hill near where the water main from the existing source enters the City, and is significantly higher in elevation than the rest of the City. For instance, the bottom of the tank is at 2210 and the highest service in town is at 2117.

4.3.3 Current and Future System Demands

Chapter 3 (Planning Data and Demand) presents information on water demands for the City of Clark Fork water system and provides an estimate of projected water demands through the 20-year (year 2036) planning period.

The average daily demand and maximum daily demands were determined from residential, commercial and public facilities water meters and other information provided to Parametrix by the water system's maintenance staff. PHD and MDD were allocated to junctions throughout the hydraulic model based on the contributing number of lots/parcels. Max day demands and peak hour demands were divided among the total residential connections and distributed to the junctions to whom they are adjacent.

There are currently 229 active single-family residential meters installed in the system in 2016. There are currently 52 commercial/public area meters installed in the system of which 52 are currently active in 2016. Meter readings from the residential and commercial/institutional were used to calculate the ADD. The maximum daily demand was calculated by multiplying the average day demand by the weighted average peaking factor of 2.8 (see Chapter 3 for a detailed discussion on how these numbers were derived).

4.3.4 Peak Hour Demand

Peak hour demand typically occurs in the summertime during irrigation hours. The IDEQ requires that the 2016 PHD is generated from the data discussed in Chapter 2, however the City does not record data on an hourly basis. Therefore, the PHD will be estimated using the following formula*:

PHD = (MDD/1440)[(C)(N) + F] + 18

Where: **PHD** = Peak Hourly Demand (GPM)
C = Coefficient Associated with Ranges of EDUs
N = Number of Service Connections, EDUs
F = Factor Associated with Ranges of EDUs
MDD = Maximum Day Demand (gpd/EDU)

*2009 WADOH Water System Design Manual Section 5.2.4

Table 4-3 summarizes the average day demands, maximum day demands, and peak hour demands on the system, without conservation.

Table 4-3. Peak Demand Projections and Calculations

Demand Type	Total System EDU's	System EDU Demand	System Demand
Year 2019			
Average Day Demand (ADD)		251 gpd/EDU[2]	93,246 gpd[4]
Maximum Day Demand (MDD)	371[1]	703 gpd/EDU[3]	261,089 gpd[4]
Peak Hour Demand (PHD)[5]			405 gpm
Year 2024			
Average Day Demand (ADD)[1]		250 gpd/EDU[2]	94,576 gpd[4]
Maximum Day Demand (MDD)[2]	379[1]	699 gpd/EDU[3]	264,812 gpd[4]
Peak Hour Demand (PHD)[5]			410 gpm
Year 2038			
Average Day Demand (ADD)[1]		247 gpd/EDU[2]	98,431 gpd[4]
Maximum Day Demand (MDD)[2]	398[1]	692 gpd/EDU[3]	275,606 gpd[4]
Peak Hour Demand (PHD)[5]			422 gpm

1. See Table 4-6 and Table 4-7.
2. Calculated by system ADD divided by total system EDU's.
3. Calculated by system MDD divided by total system EDUs.
4. See Table 4-7.
5. 'C' coefficient = 1.8 and 'F' factor = 125 for EDU's = 251-500 'C' and 'F' values are from Table 5-1 of the WA DOH WATER SYSTEM DESIGN MANUAL, 2009.

4.3.5 Modeling Scenarios

IDEQ requires that water systems be evaluated for the following flow conditions for each zone:

- PHD under the condition where all operating and equalizing storage volume has been depleted and assuming that all sources are operating. Under this condition, the distribution system shall provide pressures of at least 40 pounds per square inch (psi) (IDAPA 58.01.08 – 522.01 b.viii).
- Fire suppression flows during maximum day demand (MDD) under the condition where fire suppression storage and equalizing storage has been depleted with any pump out of service. The distribution system shall provide pressures of at least 20 psi (IDAPA 58.01.08 – 522.01 b.i).
- Maximum Static pressure of 100 psi and ordinarily less than 80 psi (IDAPA 58.01.08 – 522.01 b.vi).

The 2015 International Fire Code's (IFC) minimum fire flow requirement is 1,000 gpm for a duration of 1 hours, which is equivalent to 60,000 gallons. This fire flow requirement is based on the International Building Code's minimum required fire-flow and flow duration for residential dwellings with no automatic sprinkler system. The IFC also prescribes minimum fire flows for other buildings and materials of construction; For example, a Type V (combustible construction - wood frame) building with square footage in the range of 0-3,600 square feet has a minimum required fire-flow of 1,500 gpm for a 2-hour duration. This flow will be used for the total volume required for fire suppression as it is an achievable

middle ground for the City at 180,000 gallons. For most nodes within the model, the required fire flow has been set at 1000 gpm per direction by the fire chief as that is the target fire flow for the City's residential connections. See Appendix B-2 for the letter from the fire chief and the IFC requirements.

Additionally, pipe velocity in the distribution system should be maintained at 8 feet per second (fps) or less under PHD conditions. Maximum velocities of greater than eight fps may occur under fire flow conditions for short sections of mains or in piping within pump and valve station facilities up to a maximum of 10 feet per second.

If the above requirements were not met, system deficiencies were noted and improvements were analyzed until minimum 2015 IFC fire flow requirements were met along with meeting maximum pipe velocities and minimum system pressures.

As stated in Section 4.3.1, the existing system will not be analyzed in this plan, as any model developed would not represent the existing system with the amount of unknown pipe conditions; however, the existing system model is provided in Appendices C-1 and C-2 for reference. For the interim cases where only certain pipes have been replaced it was assumed that for modeling purposes, the existing pipes would function based on their known diameters. This will result in modeling that may not mirror the real-world conditions, but without this assumption, no modeling would be feasible.

System demands were established per the demand forecasting discussed earlier in this report. These demands were distributed based on grouping and allocating the demands per EDU to the nearest junction in the hydraulic model as shown in the map provided in Appendix C-7. A map of the water model that illustrates the pipe and junction (node) numbering system for each plan year is also provided in Appendix C-7. Table 4-4 below describes the modeling scenarios with relevant results conducted as part of the Clark Fork Water System Plan.

Table 4-4. Modeling Scenarios for Clark Fork Water Facilities Plan

Description	Facilities	Demand	Purpose
6-year (2024) Peak Hour	6-year CIP System	6-year (2024) Peak Hour Demand	Evaluate system performance and develop 6-year CIP for peak hour conditions
20-year (2038) Peak Hour	20-year CIP System	20-year (2038) Peak Hour Demand	Evaluate system performance and develop 20-year CIP for peak hour conditions for final system
6-year (2024) Fire Flow	6-year CIP System	6-year (2024) Maximum Day Demand plus fire flow	Evaluate system performance and develop 6-year CIP for fire flow conditions
20-year (2038) Fire Flow	20-year CIP System	20-year (2038) Maximum Day Demand plus fire flow	Evaluate system performance and develop 20-year CIP for fire flow conditions for final system

WaterCAD modeling software output data for the above scenarios can be found in the following appendices:

Appendix C-1: PHD, Base Year (2018)

Appendix C-2: MDD plus Fire Flow, Base Year (2018)

Appendix C-3: PHD, 6-Year (2024)

Appendix C-4: MDD plus Fire Flow, 6-Year (2024)

Appendix C-5: PHD, 20-Year (2038)

Appendix C-6: MDD plus Fire Flow, 20-Year (2038)

For these modeling scenarios, a methodology was developed to determine during which scenarios certain improvements would be made to the system. A hierarchy of required improvements was developed based on knowledge of the existing system and discussions with the City. The series of items that will be addressed is shown in the list below.

This Hierarchy is based on several risk factors including likelihood of failure without the proposed improvements, direct impact on system performance, and cost of the alternatives. The improvements address the system deficiencies and will improve system reliability and resident safety. After discussions with the City, their desire is to focus first on the source and storage issues as the existing wooden pipeline is a weak link in the distribution system, and the water tank cannot meet the required fire flow volumes.

<u>6-Year Water System Improvements</u>

1. Fire Suppression Storage and Water Source: the current water tank is undersized for the fire suppression needs of the City. The first project will construct a new water tank to meet volume requirements. The backup well on 9th Avenue will be refurbished to bring it online so that the existing Spring Creek Well can be moved to a "Emergency Only" status and the wooden pipeline can be separated from the rest of the system via valves. New connection piping will also be installed to connect the reservoirs to the new well. This will allow the current main line suspended over Lightning Creek to be removed. Additionally, several dead-end pipes will be "looped" to eliminate the need for periodic flushing.

<u>20-Year Water System Improvements</u>

2. Existing Water Line Replacement: existing cast iron and ductile iron pipes and system valves will be replaced to improve system performance. Some undersized PVC pipes will also be replaced to increase available flow.
3. Treatment Plant: The City would like to add a treatment and softening plant at the 9th Avenue well to improve the quality of the water that gets distributed to the consumers.

To establish the 6-year model, the recommendations from the City were used to add looped water mains to certain areas of the system that require frequent flushing's to maintain water quality. Other pipelines were added to reroute the crossing over Lightning Creek to the highway bridge which already has a sleeve prepared for use.

Also for the 6-year model, required storage facilities had to be included to increase the City's total available fire flow storage up to the required 180,000 gallons. To establish a baseline for fire flow availability, a 20-psi minimum system pressure was used to analyze the available flow at each hydrant node within the water system, due to the level of the existing tank being such that all the serviced nodes within the system are above 20-psi even with the tank depleted, the tank water level was set to the bottom. The required volumes of water above this elevation were then calculated as detailed later in this chapter. The total required volume was compared to the available volume, and the new tank was established based on these requirements.

Lastly for the 6-year model, the well on 9th Avenue was added, and the Spring Creek Well was disconnected. It was assumed that the well would produce at least 300 GPM and that additional groundwater rights were swapped for the existing surface water rights allowing for more withdrawal than the existing water rights for the well allow. This well was modeled at 300 GPM for this report's

purposes, but could be increased to 400 GPM while maintaining the existing 4-inch diameter discharge column and 8-inch diameter well casing. For flows higher than 400 GPM a new well would need to be drilled to ensure that a larger diameter pipe and pump would fit. For a more conservative analysis, each of the scenarios were modeled with the wells offline as it would better approximate how the system actually functions: demands met by gravity feed and storage volume replenishment intermittently.

To establish the 20-year model, further system enhancements and repairs were included. All the non-PVC pipes have been replaced within the distribution system, as well as the undersized pipes restricting available fire flows. All the other modifications from the 6-year model are included.

New water pipeline sizing was determined as follows: Water main from tanks and providing transmission backbone is 10-inch minimum, mains and loops within system are 8-inch minimum, and internal system piping upgrades are 6-inch minimum.

4.3.6 Peak Hour Demand Modeling Results

Two of the hydraulic modeling scenarios conducted were PHD conditions on the future 6-year (year 2024) and 20-year (year 2038) systems. Table 4-3 lists the peak hour demands of 410 gpm and 422 gpm which were distributed throughout the model based on known locations of EDU's. The reservoir level (elevation 2210) was set at the bottom of the calculated equalization storage volume of 41,700 gallons (7.9 feet in the new combined tank). Service connection pressures in the existing distribution system were all above the minimum required 30 psi with the lowest serviced pressure at approximately 53 psi.

Table 4-5 summarizes the PHD hydraulic model inputs and results.

Table 4-5. PHD Hydraulic Modeling Summary

Model Run	Pressure Zone	Tank Water Elevation	Treatment Plant Pump Operation	30 psi at All Service Connections	Maximum Pipe Velocity (Ft/s)	Number of Deficiencies	Comments
6-year	Gravity	2240	Off	Yes	2.62	0	None
20-year	Gravity	2240	Off	Yes	2.69	0	None

4.3.7 Fire Flow Modeling Results

The water system was evaluated under MDD plus fire flow (FF) conditions to determine its capability of providing fire protection to system users. Typically, fire flow conditions represent the worst-case scenario for water systems due to high flow rates for long durations that are required to fight building fires. Provided below is a summary of the completed fire flow modeling.

A residential fire flow requirement has been assumed for the City of Clark Fork of 1,000 gpm for a duration of 1 hours, and a commercial and public fire flow of 1,500 gpm for 2 hours while providing a minimum of 20 psi (residual) system pressure at ground level along gravity zone pipeline junctions (i.e., fire hydrants) while also providing the required fire flows. A higher required fire flow was used for the two largest buildings in the City (Church and School) per the International Fire Code based off building construction type and building size. See Appendix D for a letter from the Fire Chief Richard Harter (AHJ for City of Clark Fork) and the 2015 IFC fire flow targets.

The 6-year fire flow model sets a baseline for improvements that should be finished by the 20-year planning horizon to achieve the minimum fire flows to all hydrants within the City. The results also show

that even if the existing pipelines were not restricted by scaling, reaching the required 1000 GPM would require significant upgrades. See Appendix C-4 for the 6-year fire flow results.

The 20-year fire flow model shows what the system could be if all the undersized and metal water pipelines were replaced with larger PVC pipes. See Appendix C-6 for the 20-year fire flow results.

4.4 Source of Supply Analysis

The IDEQ Design Manual requires that a water systems source can provide water at a rate equal to the MDD for the area being evaluated. For the source of supply analysis, the well north of town is the primary active source for the entire system. Water rights exist for the surface water source adjacent to the northerly well, however, considerable treatment would be required for use. The backup well on 9th Ave is not currently treated and would require treatment were it to be used in the future.

The source of supply analysis assumes that the pump can operate 24 hours a day with a capacity of 300 GPM, which results in a daily production of 432,000 gallons. The year 2019 MDD/EDU for the system is 703 gpd/EDU and there are 371 EDUs, resulting in a system MDD of 261,089 gallons. The available source production is greater than the MDD for the system in the base year. See Table 4-6 below for full system source analysis details.

Table 4-6. Evaluation of Source Adequacy

	Year		
	2019	**2024**	**2038**
Projected EDUs and Demand[1]			
Equivalent Dwelling Units (EDUs)	371	379	398
Projected Demand (gpd)			
Average Day Demand	93,246	94,576	98,431
Maximum Day Demand	261,089	264,812	275,606
Available Sources (gallons per day - gpd)[2]			
Spring Creek Well	432,000	N/A	N/A
9th Avenue Well	N/A	432,000	432,000
Total Available Source (gallons per day - gpd)	432,000	432,000	432,000
Source Surplus/(Deficiency)[3] **(gpd)**	170,911	167,188	156,394
Water Rights Limitation (gpd)[4]	N/A	N/A	N/A

1. Number of EDUs based on gpd per ERU values from Table 4-2.
2. Capacity of source based on current existing Spring Creek Well capacity of 300 gpm and assumed available flow from upgraded 9th Avenue well of 300 gpm.
3. Available source minus Maximum Day Demand.
4. Water right instantaneous withdraw is limited to 300 gpm, with no limit on total volume.

4.5 Storage Analysis

Storage is important for any water system to meet fire suppression requirements, daily diurnal usage patterns, peak demand periods, and emergency situations when sources may be compromised. IDEQ requires reservoir sizing based on five different types of storage; designed to provide adequate storage

to deal with these stresses on the system. Requirements for reservoir capacity can be found in IDAPA 58.01.08.544.01 and IDAPA 58.01.08.003.15. Additive storage types are as follows:

- Operational Storage
- Equalizing Storage
- Standby Storage
- Fire Suppression Storage
- Dead Storage

The local fire chief does not require that the standby storage component and the fire suppression storage component of the tank be additive; therefore "nesting" of the standby storage and fire suppression storage is allowed. The more critical storage volume between these components (fire suppression) was used in this analysis.

Storage analysis included consideration of the five Department of Environmental Quality (DEQ) storage components. DEQ guidelines and criteria have been used to calculate required storage components. See Table 4-7 below for a summary of equations and criteria for determination of storage components.

Table 4-7. DEQ Storage Sizing Requirements Summary

Operational Storage (OS)	Equalizing Storage (ES)[1]	Standby Storage (SB)[2]	Fire Suppression Storage (FSS)[3]	Dead Storage (DS)
Pump on & off elevations were obtained from the system operator. Elevations were set to reduce pump cycling.	ES = (PHD-Q_s)*(150)	Eqn 1: SB = (2days)*(ADD)*(N) Will be nested in FSS	Q_{FF}*t=FSS 180,000 Gallons	Volume of tank below 20 psi minimum system pressure under MDD plus fire flow

1. PHD = Peak Hour Demand based on WA DOH Equations. Qs is source capacity. QFF is the required fire flow. t is the required fire flow duration.

2. Eqn 1: SB for single source systems (zones); ADD = Average Day Demand; N = ERUs

3. Fire flow requirements are from IFC and confirmed by Richard Harter, Fire Chief of the City of Clark Fork.

Results of storage component calculations were compared to the available storage components in the existing reservoir. See Figure 4-3A for existing reservoir elevations and storage component capacities and Figure 4-3B for the combined reservoir relative elevations and capacities. Dimensions and elevations for the existing reservoir are from the system inventory shown in Table 4-2. And the combined reservoir is sized to eliminate the storage deficiencies within the system.

Table 4-8. Evaluation of Storage Adequacy for Gravity Pressure Zone

Description	Year 2019	2024	2038
Projected EDUs and Demand[1]			
Equivalent Residential Units (EDUs)	371	379	398
Average Day Demand (gpd)	93,246	94,576	98,431
Maximum Day Demand (gpd)	261,089	264,812	275,606
Peak Hour (gpm)	405	410	422
Available Source (gpd)[2]			
Spring Creek Well	432,000	N/A	N/A
9th Avenue Well	N/A	432,000	432,000
Total source available to meet deficiency based on water rights (gpd)	432,000	432,000	432,000
Required Storage Calculations			
Calculated Standby Storage (gallons)[3]	186,492	189,152	196,862
Equalizing Storage (gallons)[4]	15,750	16,500	18,300
Fire Suppression Storage (gallons)[5]	180,000	180,000	180,000
Nested Standby Storage & Fire Flow Storage (gallons)[6]	186,492	189,152	196,862
Total Required Storage (gallons)[7]	202,242	205,652	215,162
Available Existing Storage (>30 psi) (gallons)[8]			
Existing Storage > 30 psi (gallons)	108,383	108,383	108,383
Available Existing Storage (>20 psi) (gallons)[8]			
Existing Storage > 20 psi (gallons)	108,383	108,383	108,383
Storage Surplus/(Deficiency) (Gallons)			
> 30 psi	(93,859)	(97,269)	(106,779)
> 20 psi	(93,859)	(97,269)	(106,779)

1. Projected EDU's and demands are from Table 3-2.
2. Available source assumes source pumps are on for 24 hours per day, at a production rate of 300 gpm.
3. Required Standby Storage for existing source (DOH eqn. 9-2): SB=2*ADD*# of ERU's.
4. Required equalization storage = (Peak Hour Demand - Total Available Source) * (150 min.).
5. Required fire flow storage = 180,000 gallons (1500 gallons per minute for 120 minutes).
6. The standby storage volume has been consolidated with the fire suppression storage volume to provide the nested volume shown.
7. The total required storage volume is equal to the nested fire suppression volume and the equalization storage volume (operational storage volume is ignored, OS = 2 feet).
8. Available storage for the analysis is based on highest service connection (elevation 2117) within the gravity pressure zone.

The results from Table 4-8 show that the existing system storage is deficient by nearly 50 percent in its current configuration. This will require the construction of new storage within the system to mitigate.

Luckily, the location where the existing tank is located has some available space for construction of a new tank.

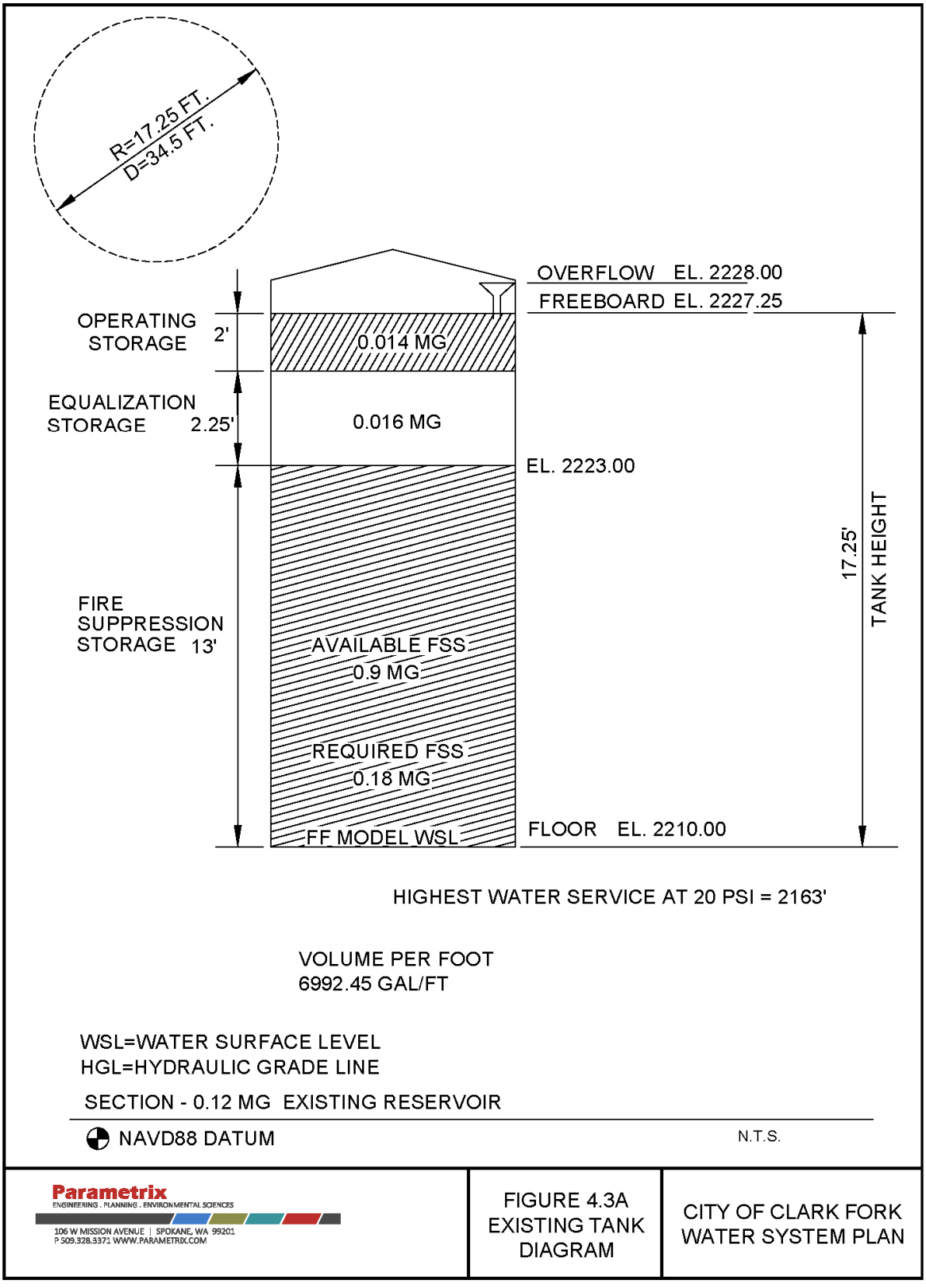


Figure 4-3A. Existing Tank Diagram

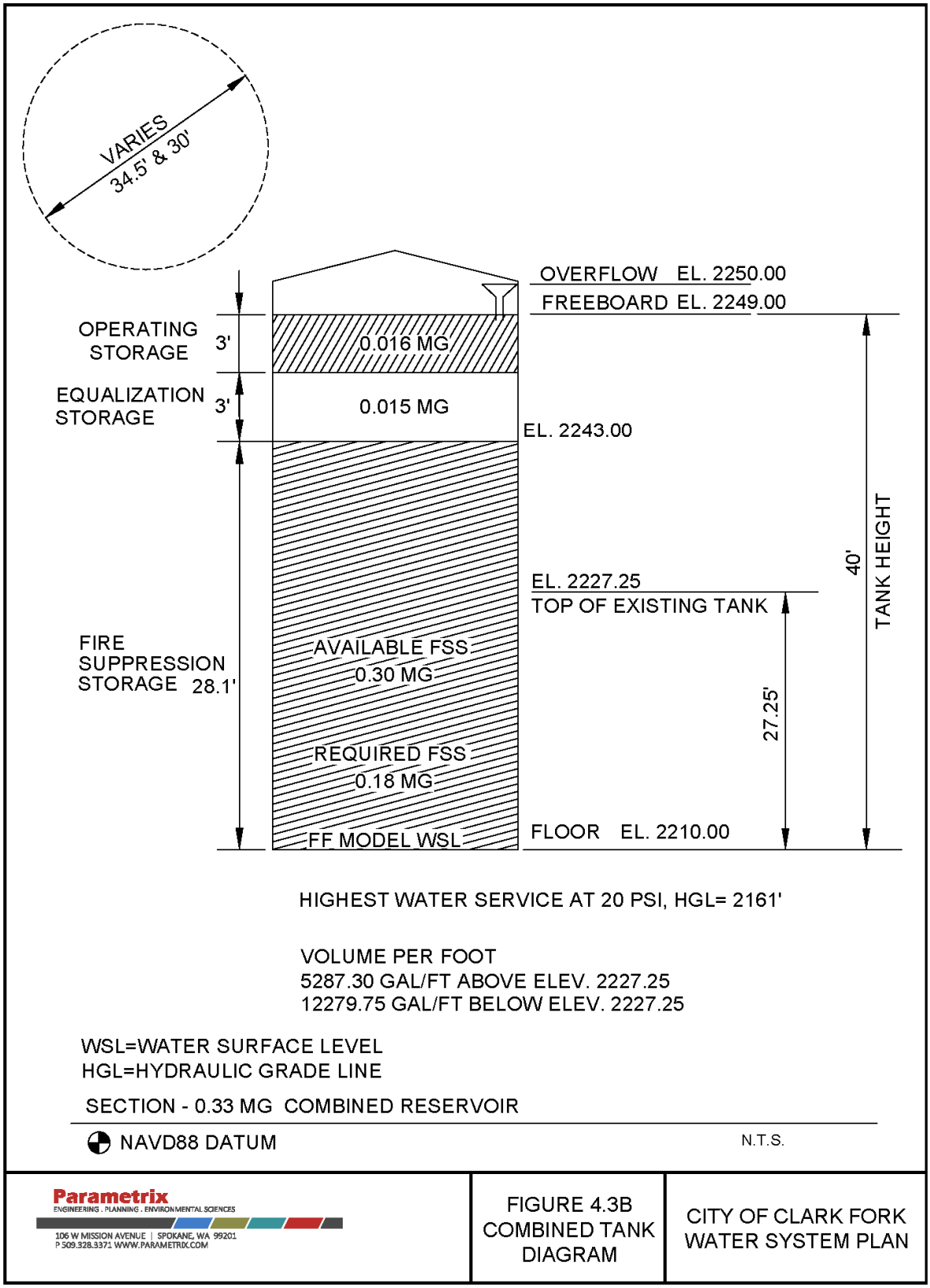


Figure 4-3B. Combined Tank Diagram

4.6 Emergency Operations

IDAPA 58.01.08.501.07 requires that water systems have sufficient dedicated on-site standby power, with automatic switch-over capability, and/or storage so that water may be treated and supplied to pressurize the entire distribution system during power outages if standby storage is not available. During a power outage, the water system must be able to meet minimum operating pressure requirements for a minimum of 8 hours at ADD plus fire flow, where provided.

The City Currently does not have adequate storage to meet the standby storage, but they do have a mobile generator that they can use to temporarily power their Spring Creek Well in the event of a power outage. The system upgrades will incorporate additional storage to help meet that standby storage volume so that during a power outage, the consumers could still use water.

4.7 Water Quality Analysis

The City of Clark Fork upgraded their water system in 1978 and 1985, which consisted of updates to the Water Treatment facility to meet current water system design standards. Currently, the City of Clark Fork chlorinates their water source with sodium hypochlorite injected into the water piping. The City of Clark Fork has historically provided high quality water to its residents after it changed from a surface water source on Spring Creek to a groundwater source adjacent to the original source. The City is currently in compliance with all water quality monitoring requirements. The City encourages public participation in its water utility and annually publishes a Consumer Confidence Report (CCR) describing the City's water quality parameters (see Appendix G).

This section provides a summary of water quality information and an overview of the City of Clark Fork's compliance.

4.7.1 Source Water Protection

The Safe Drinking Water Act (SWDA) (Section 1428) established a Wellhead Protection Program (WHPP) to protect groundwaters that contribute to public water systems. IDEQ has expanded those Federal source protection regulations to include all community water systems, including groundwater, GUI (groundwater under the influence), and filtered and non-filtered surface water sources. Accordingly, IDEQ has developed regulations that require all water systems that maintain and operate their own sources to implement a WHPP (IDAPA 58.01.11). The City of Clark Fork's Watershed Protection Program (EWWP) is contained in Chapter 6.

Source water protection programs are planning tools to be used by water utilities to identify potential sources of water contamination, and to protect existing and future drinking water supplies. The City of Clark Fork has prepared and implemented a Watershed Control Program for its surface water source which is described in further detail in Chapter 6. The objective is to minimize risk of accidental releases of contaminants in areas contributing water to the public water supply. The three basic elements of a source water protection plan are:

- Definition of the area, either a Wellhead Protection Area (WHPA) or a watershed, that directly contributes to a water supply. A WHPA is defined as an area contributing to a source within a specified amount of time.
- Inventory of land uses to identify potential sources of contamination within the WHPA or watershed.

- Management strategies including emergency spill response and contingency plans to minimize or eliminate the possibility of potential contamination of the water supply.

The City of Clark Fork will be conducting the following activities during the next 6-year period for updating and maintaining the Watershed Protection Program:

- Update the Contaminant Inventory every 2-years.
- Updating the Inventory of Potential Contamination Sources.
- Updating contingency plans for providing potable water in the event that contamination results in the temporary or permanent loss of any of the principle source of supply.

4.7.2 Laboratory Certification

Table 4-9 summarizes the pertinent information regarding the certified laboratories that the City of Clark Fork currently uses for its analytical testing.

Table 4-9. Certified Laboratories Used for Analytical Testing

Name	Street	City	State	Zip	Contact Name	Phone	EPA I.D #	Active
Accurate Testing Labs	7950 Meadowlark	Coeur d'Alene	ID	83815	John Kinney	208-762-8378	ID00912	Yes
Anatek Labs, Inc.*	1282 Alturas Drive	Moscow	ID	83834	Gene Solomon	208-883-2839	ID00013	Yes

4.7.3 Summary of Regulatory Status by Source

Review of water quality data from 2010 through 2015 indicates that the City of Clark Fork has followed all effective federal and State drinking water regulations. Table 4-10 summarizes applicable regulations and the City's compliance status.

Table 4-10. Summary of Applicable Regulations and Compliance Status

Regulation	Requirements	Status	Compliance Status
Phase I, Phase II, Phase V Regulations	• Written Plan • Monitoring	• Monitoring conducted per IDEQ directed monitoring plan • Meets Maximum Contaminant Levels (MCLs)	Yes
Radionuclides	• Monitoring	• Monitors • Meets MCLs	Yes
Source Water Protection Program	• Watershed Control Program	• Submitted with this WFP	Yes
Revised Total Coliform Rule	• Written Plan • Monitoring	• Monitors throughout distribution system • Meets monitoring requirements • Submitted with this WFP	Yes
Lead and Copper Rule	• Monitoring	• Monitors	Yes
CCR and Public Notification Rules	• Annual Reports • Reporting as needed	• Consumer Confidence Reports published annually	Yes

4.7.4 Summary of Monitoring Requirements and Plans

Currently, the City of Clark Fork is required to conduct source water monitoring. Table 4-11 provides a summary of water quality source monitoring requirements for the City of Clark Fork. The table includes the parameters to be monitored, sampling location, and frequency as provided in IDEQ's most current Water Quality Monitoring Schedule Report (see Appendix C-7). Table 4-11 is intended to be a guide; detailed requirements are available in IDAPA 58.01.08 and by contacting IDEQ.

Table 4-11. Monitoring Requirements

Test	Frequency*	Last Sample	Next Sample
Bacteriological	Monthly	Monthly	Monthly
Chlorine Residuals	Daily 1 location	Daily	Daily
Nitrates	Yearly	2016	2017
Nitrites	Source, 9 years	1/01/2001 – 12/31/10	1/01/2011 – 12/31/19
Inorganic Chemical (IOC) Phase 2 and 5	Source, 9 years	1/01/2001 – 12/31/10	1/01/2011 – 12/31/19
IOC Fluoride	Source, 9 years	1/01/2001 – 12/31/10	1/01/2011 – 12/31/19
IOC Sodium	Source, 3 years	1/01/2014– 12/31/16	1/01/2017 – 12/31/19
Disinfection Byproducts Stage I	Yearly	2016	2017
Arsenic	9 years	1/01/2001 – 12/31/10	1/01/2011 – 12/31/19
Volatile Organic Chemical (VOC) Group	Source, 6 years	1/01/2010 – 12/31/15	1/01/2014 – 12/31/19
Radium 226	Source, 9 Year Cycle	1/01/2004– 12/31/13	1/01/2014 – 12/31/22
Radium 228	Source, 9 Year Cycle	1/01/2004 – 12/31/13	1/01/2014 – 12/31/22
Gross Alpha	Source, 9 Year Cycle	1/01/2008 – 12/31/16	1/01/2017 – 12/31/26

* Based on current information, waiver requirements may be modified by IDEQ.

4.8 Source Water Quality

Table 4-12 below summarizes available key water quality parameters including average and maximum values for arsenic, nitrate, and gross alpha emitters. All samples exhibited concentrations less than the regulatory MCLs for these parameters.

Table 4-12. Source Water Quality

Parameter	Maximum Contaminant Level (MCL)	9th Avenue Well	Spring Creek Well
Arsenic	**10 µg/L**	**Not Detected**	**Not Detected**
Average			
Maximum			
Nitrate	**10 mg/L**	**Not Detected**	**Not Detected**
Average			
Maximum			
Gross Alpha	**15 pCi/L**		
Average		**0.17 pCi/L**	**0.13 pCi/L**
Maximum		**0.5 pCi/L**	**0.2 pCi/L**

µg/L = micrograms per liter

pCi/L = picocuries per liter

Data Collected from IDEQ Drinking Water Branch Records available online.

4.9 Water Quality Regulations

The SDWA establishes water quality regulations for all public water systems in the United States. There are numerous contaminants that are regulated under the SDWA that must be monitored and reported to the regulatory authority, in this case the IDEQ.

Based on this review, the City of Clark Fork is currently in compliance with all requirements of the SDWA, including arsenic, nitrate, radionuclides, lead, copper, total trihalomethanes (TTHMs), and five haloacetic acids (HAA5). It is anticipated that the City will maintain compliance with current and future regulations due to the high quality of the source water upon which the system relies.

4.9.1 Total Coliform Bacteria

The City performs Coliform sampling monthly, these results are published yearly in their consumer confidence report. All the samples tested negative for total coliform. Federal drinking water quality regulations require that less than 5 percent of coliform samples be positive.

4.9.2 Arsenic

The current arsenic maximum contaminant level MCL set by Environmental Protection Agency (EPA) is 10 micrograms per liter (µg/L; however there is some discussion in the industry that the standard could potentially be lowered in the future, perhaps to a level of 5 µg/L or lower. While this may or may not come to pass, the current City arsenic data have a minimum detection limit of 5 µg/L, with all samples collected during the past five years yielding results of non-detect, or <5 µg/L. A lower detection limit, such as 1 µg/L, would provide additional information that would be helpful in assessing future

regulatory compliance. We recommend that the City obtain a lower method detection limit (MDL) for arsenic samples for future analyses, either from the laboratory that currently analyzes the samples, or from an alternate laboratory to better quantify arsenic levels.

4.9.3 Disinfection Byproducts

Disinfection byproducts (DBPs) are formed when organic compounds in the source water, most notably humic and fulvic acids, react with chlorine which is added to the water for disinfection purposes. DBPs are typically more of a concern for surface water sources than for groundwater sources such as those used in Clark Fork. DBP samples are collected from the distribution system, as opposed to the source or wellhead, because the reactions between organic precursors and chlorine that form DBPs take some time to occur.

The City collected samples for DBPs from 2004 to 2018. Samples were collected at four locations in the distribution system as required by the Disinfection Byproduct Rule. The DBP Rule regulates the concentration of TTHMs and the concentration of HAA5 at MCLs of 80 ug/L and 60 ug/L, respectively. All samples collected were well below these limits.

4.9.4 Lead and Copper

The Lead and Copper Rule (LCR) regulates the concentrations of lead and copper in public water systems at Action Limits (ALs) of 0.015 milligrams per liter (mg/L) for lead and 1.3 mg/L for copper. A public water system's 90th percentile lead and copper levels must be less than the respective Action Limits to maintain compliance with the LCR. The City is currently in compliance with the LCR based on the most recent sampling which was conducted during 2015. five samples were collected on August 4, 2015 from different locations in the distribution system. The 90th percentile lead concentration was 0.006 mg/L which is less than the lead AL of 0.015 mg/L and therefore achieves compliance with the lead standard. The 90th percentile copper concentration was 0.641 mg/L which is less than the copper AL of 1.3 mg/L and therefore achieves compliance with the copper standard. Because the lead and copper sample results are well below their respective ALs, maintaining compliance with the LCR into the future is anticipated.

4.10 Summary of System Deficiencies

System analysis from earlier in this chapter determined that the system is lacking in several areas. Pipelines within the system are not only undersized in many areas, but they are also considerably scaled effectively reducing the diameter of all affected pipes. The under sizing and scaling reduces the available flow below the prescribed minimums and increases a risk of a catastrophic failure. Other distribution system deficiencies include a lack of operable isolation valves, old hydrants and dead-end pipes. Addressing these deficiencies will require city wide replacement of all cast iron, ductile iron and galvanized steel pipelines with PVC, installing new isolation valves at every intersection when replacing pipes, and updating hydrants with ones that meet new standards.

The No Action alternative will put the City in a precarious position, as it ignores the system's degrading infrastructure. Without addressing these issues proactively, the City will be waiting for catastrophic failure and increasing total costs due to the emergency status of required repairs or replacements. Depending on the type of failure, the City might need to provide bottled water, or be required to take a contract for repairs that is not in the City's best interest.

Current source capacities are adequate for the system's demands; however, the existing wells are aging and will need to be upgraded and/or replaced soon. The existing Spring Creek Well is too far from town with too much transmission pipe in unknown condition or location to be considered for long term use. The well on 9th Avenue could meet the City's demands for the long term as it is already operable, it would just need a treatment system, new control building and new pump. When the 9th Avenue well becomes the City's new sole source, the Spring Creek well could move to an emergency only status. To maintain the main line from the Spring Creek well, a jockey pump of some kind, and a valve system will be required to reduce the risk of a depressurization event which could contaminate the existing water system.

The City's current groundwater rights are only currently applicable to the 9th Avenue well; however, the City still maintains considerable surface water rights (~300 cubic feet per second [CFS]) that could be swapped for more ground water rights if desired. The rate at which this trade off would happen would not be one to one, but the City could secure more than enough ground water source capacity to meet their needs for many years into the future. This will be discussed further in the following chapter.

Storage analysis revealed that the existing tank is significantly undersized to meet required fire flow volumes. The new fire flow and storage volume requirements require almost doubling the total storage for the City. Luckily, the parcel that the City owns where the existing tank is located has some extra area that could likely fit the new tank's footprint. The sizing of the tank takes advantage of the availability and price of cast in place concrete storage tanks of standard sizes.

The City's current treatment and testing strategies have been consistently within local and federal regulatory requirements for some time. The goal of the City is to maintain this good record into the future, and adopt new requirements and standards as they are enacted.

5. WATER RESOURCE ANALYSIS & WATER CONSERVATION

5.1 Metering Program

The City of Clark Fork meters the source of their drinking water in the Water Treatment Building. The meter is an 8-inch propeller meter with mechanical read which is read occasionally. No records exist that detail past maintenance or calibration, so it was assumed that it would be replaced as soon as feasible. One of the Capital Improvement Projects included in Chapter 8 is the addition of an electromagnetic flow meter in the 9th Avenue well when it is brought online.

5.2 Current Water Conservation Program

This section describes the City of Clark Fork's current water conservation program, and summarizes the future direction of the program. Clark Forks' interest in water conservation is driven by a desire to minimize the City's impact on the local aquifers. Their intent is to limit increases in water use due to system losses and offer users benefits to conserve water in their homes.

The City's efforts have been concentrated in data gathering and distribution of educational information and conservation devices to the public.

The City's current conservation program features both system-side and demand-side elements, as shown in Table 5-1.

Table 5-1. Current Conservation Program

System-Side	Demand-Side
• Meter calibration • Water balance accounting • Leak detection	• Audits for outdoor irrigation • Public information and education: demonstration garden, school programs, and promotion through various outlets (e.g., the City website, newsletters, bus posters, display boards, booths at community events, messages on customer bills, the annual water quality report, flyers, awards recognition, conferences and speaker presentations.) • Tiered rate structure • Water Conservation Plan

5.2.1 Water Supply Characteristics

The City of Clark Fork's primary water source lies within the Pend Oreille Lake Watershed Area (HUC 17010214). The source is a groundwater well adjacent to Spring Creek located a few miles to the northwest of town. The water is supplied via a pump house which is pumped through the treatment injection systems in the Water Treatment Building and then flows to a 122,000-gallon storage tank. The distribution system downstream of the storage tank is fed by gravity via the tank. For further water supply characteristics information see Chapter 6, Watershed Control Program.

5.3 Water Rights Assessment

The purpose of this section is to assess the available and existing water rights to better plan for future needs. The City Clark Fork provides potable water to City residents from one groundwater well. The City also provides water for irrigation of public parks, landscaped areas, and open spaces.

5.3.1 Potable Water

The City of Clark Fork is authorized to use one well for delivery of groundwater to City customers through its potable supply system (9th Ave). The City has groundwater rights issued by the Idaho Department of Water Resources (IDWR) for a total instantaneous quantity of 0.67 cfs. Table 5-2 below for a summary of all the City's Water Rights.

5.3.2 Non-Potable Water

The City still retains surface water diversion rights from Spring Creek as depicted in Table 5-2 below. The City is not currently utilizing these rights.

Table 5-2. Water Rights Summary

Water Right Number	Description	Source	Priority Date	Max. Instantaneous Withdrawal - cfs	Max. Instantaneous Withdrawal - gpm	Purpose of Use	Notes
96-4015	Surface Water Diversion	Spring Creek	1911	5.0	2,244.15	Multiple Domestic Uses	No longer connected to system
96-4229	Surface Water Diversion	Spring Creek	1911	300	134,659	Municipal Water	No longer connected to system
96-7459 (96-2046)	Surface Water Diversion	Spring Creek	1921	3.5	1,570.9	Irrigation and Domestic Uses	No longer connected to system
96-7733	Groundwater	9th Avenue	1978	0.67	300.7	Municipal Water	
			Total	**309.17**	**138,774.75**		

It should be noted that the City's water rights do not include a limitation for the annual quantity. Currently the limiting factor is the size of the pump at the Spring Creek wellhead which provides a maximum peak flow of 300 gpm.

5.3.3 Instantaneous Water Right

The peak hour demand of the water system in the year 2024 is 410 gpm (379 EDU's) and 422 gpm in the year 2038 (398 EDU's). Therefore, the total instantaneous draw in years 2024 and 2038 appear to exceed the 300.7 gpm limit allowed by the permit. This excess in demand of the peak day (i.e. peak hour demand) in the years 2024 and 2038 is met using equalizing storage in the 122,000-gallon tank and not

by pumping additional water from surface water source. According to Table 4-3, the peak (maximum day) demand in the year 2024 is 264,812 gallons per day or 184 gpm pumping for 24 hours. If peak day demand is less than the instantaneous water demand water right, the instantaneous water right is adequate.

A possible alternative to the City's current water system would be to convert their existing surface water rights into more ground water rights and switch their main source from the well to the North and upgrade their existing well located on 9th Avenue to service the entire system.

5.4 Water Supply Reliability Analysis

5.4.1 Source Reliability

The City of Clark Fork has received a sufficient quantity of good quality drinking water from the groundwater well and Water Treatment system since they were upgraded in the 1980s.

5.4.2 Water Right Adequacy

As discussed in section 4.4.3 above, the existing water rights for the City of Clark Fork are adequate to meet future water demands in the future. With continuation of the conservation measures, repair of distribution leakages and continued source and usage metering the City will be able to manage water usage.

5.4.3 Facility Reliability

As described in Chapter 1 and Chapter 3 of this plan, the City's supply, storage and distribution system are showing their age and are no longer adequate to meet system demands. Upgrades performed to the system in 1985 and 1986 did improve the system. However, a lack of system upgrades and storage addition has left the system with numerous deficiencies.

5.4.4 Water Shortage Response Planning

Water shortages for reasons other than emergency situations are a possibility. The City will address any shortages as they occur. The City will address any shortages due to emergency situations as provided in their emergency response plan as they occur which is discussed in Chapter 6. In the event of a power outage, the City has a portable generator that can be utilized to power the existing wells. In the event of a contamination event, the City has a backup well which could supply water temporarily; however, because it is untreated, it would likely be water of a lesser quality.

5.5 Green Power Partnership

The City became an EPA Green Power Partner in 2018 to establish Clark Fork as a forward-thinking environmentally conscious community. The City pays a premium on its municipal power consumption to invest in the future growth of renewable energy from its utility provider: Avista. The City must report their annual usage and investigate measures to reduce its total power consumption. Currently the City uses 14,400 kWh of green power which is 23% of their total usage.

6. WATERSHED CONTROL PROGRAM

6.1 Description

The City of Clark Fork uses groundwater for its water supply. To protect groundwater supplies, the IDEQ requires public utilities to develop and implement a Watershed Control Program as part of their Water System Facilities Plan.

The purpose of a Watershed Control Program is to provide the City of Clark Fork with a proactive program for preventing source water contamination. A successful watershed control program consists of several components, which must be developed before the plan can be fully implemented. The major components of the plan are described below and form the basis of this chapter:

- A complete susceptibility assessment for the source.
- A delineated watershed protection area defined by the entire watershed up-gradient of the intake point. This includes the initial watershed plus any open conveyance mechanism and/or storage reservoirs.
- A sanitary control area.
- An inventory within the source protection area of potential sources of contamination.
- Watershed control measures to reduce the likelihood that potential contaminant sources will pollute the drinking water supply.
- A description of the system operation and emergency provisions.
- Documentation of water quality trends.

The City of Clark Fork currently monitors activities within the watershed that may affect source water quality. The watershed control program will be re-evaluated every six years per regulations. Changes that affect the source water quality will be documented and recommendations made for improved watershed control.

6.2 Watershed Description and Inventory

The watershed description and inventory provides site-specific information including location, land ownership and activities that may adversely affect source water quality.

6.2.1 Location

The City of Clark Fork is in Bonner County approximately 45 miles north of Coeur D'Alene and 55 miles south of the Canadian border in north Idaho. The City's Water System is supplied by a groundwater well near Spring Creek, and a backup well near 9th Avenue.

6.2.2 Hydrology

Average monthly rainfall for Clark Fork ranges from 0.98 to 4.37 inches with an annual average of 31.63 inches (Cabinet Gorge 1981-2010 - normals). Surface elevations within the watershed range from 2100 to 2530 feet (NAVD 88 Datum). Runoff occurs primarily November through June when soils are saturated and rainfall is greatest.

6.2.3 Land Ownership

The IDEQ created the Source Water Assessment area for the well at Spring Creek and at 9th Avenue as well in 2002. These assessments are provided in Appendix E-2. The Assessment Area surrounding the Spring Creek well is approximately 91 acres, while the area surrounding the 9th Avenue Well is approximately 22 acres. The City owns only a portion of the land within the assessment areas. The land use map provided in Appendix A-5 illustrates land ownership within the area. If future development presents a threat to water quality in the Spring Creek and/or 9th Avenue assessment areas, the city may consider purchasing additional land.

6.3 Watershed Inventory of Potential Contaminant Sources

An essential element of the watershed control program is an inventory of past, present and proposed activities that may pose a threat to water quality in the watershed protection areas. The contaminant source inventory considers existing and potential sources of contamination related to watershed activities and land use. This includes both point and non-point pollution sources. Within a watershed protection area, there are many diverse activities that may impact a water supply. It is important that these activities are properly inventoried and, if necessary, regulated to prevent degradation of the water source. These activities may include land use and zoning practices, solid waste, wastewater and stormwater discharges, agriculture, underground storage tanks, septic tanks, and other types of contamination. A discussion of these practices and their potential impact on the City's water supply are included in the subsections below. The assessment area surrounding the Spring Creek well is relatively isolated and sparsely populated. Based on land ownership and zoned uses, the primary potential contaminant concerns are agricultural land use, logging and abandoned mines.

In the 2002 Source Water Assessment summary report that was revised in 2013 for the Spring Creek well and 2016 for the 9th Avenue well, IDEQ performed a susceptibility analysis to determine the likelihood that the Spring Creek and 9th Avenue water supply will become contaminated. This document is included in Appendix E-1.

6.3.1 Agriculture

Agricultural uses exist in the Spring Creek watershed. These include small livestock operations including sheep, cattle and horses. If not properly managed, agricultural operations can contaminate surface water. Contaminants can include, but are not limited to, sediments from soil erosion, nutrient loading, microbiological, and chemical contaminants. Farming activities that can cause water quality problems include sub-standard pasture management, use of chemicals, poor management of animal wastes, unlimited access to surface water or spring source and overgrazing of sensitive areas.

6.3.2 Forestry

Forestlands comprise approximately 66 percent of the watershed. Local timber harvested may be used for saw logs, pulpwood, export logs and firewood. Without proper management, timber harvesting and subsequent site preparation activities have the potential to adversely affect water quality through increased soil erosion and sedimentation, soil compaction and water temperature increases, as the thermal cover is removed.

6.3.3 Mining (Historic)

Mining of metal may have occurred near the assessment area over the previous century in the Spring Creek watershed at two separate locations; Hope Mine and Whitdelph Mine. The surface water in Spring Creek has been tested and it does not exhibit the presence of elevated metals due to mining activity.

6.3.4 Roads

Roads are potential sources of contamination to surface waters through their potential for spills, construction and maintenance activities, and general vehicular traffic that can introduce chemicals and sediments into runoff from roadways. County or rural roads that are unpaved or have gravel shoulders can contribute sediment, nutrient and metal loading into tributaries and nearby streams.

6.3.5 Solid and Hazardous Waste

These wastes, if not managed correctly, can pollute surface and groundwater with hydrocarbons, heavy metals, toxic organic chemicals and other pathogens. Proper management is essential for reducing or eliminating the potential water quality pollution from these waste streams. Management includes collection, storage, transportation, transfer, treatment, and disposal of the waste material. Solid waste includes garbage, rubbish, ashes, industrial wastes, demolition and construction debris and abandoned vehicles. Garbage disposal for Clark Fork is provided by B&N Sanitary Disposal. Waste is collected by B&N and taken to the County transfer station, where it is collected and stored prior to being transported outside the county for disposal. Residents of Clark Fork should be encouraged to use the facilities to recycle and dispose of household hazardous waste for free or at a minimum cost. Hazardous wastes as defined are all flammable, toxic, corrosive and reactive waste generated by residences and businesses.

6.3.6 Accidental Spills

Accidental spills or releases of contaminants can potentially impact water supplies. Potential sources of spills and leaks can include underground storage tanks, accidents and poor disposal practices.

6.3.7 Confirmed or Suspected Contamination Sites

Under the Hazardous Waste Management Act, IDAPA 58.01.05, the Department of Ecology is responsible for ensuring all hazardous waste sites are properly remediated. This includes confirmed and suspected sites of contamination, as well as leaking underground storage tanks (LUSTs). A separate inventory for each, which includes the status of cleanup efforts, is maintained by IDEQ. Two sites have been identified near the watershed protection area.

- Hope Mine – This abandoned mine was recommended by IDEQ to receive additional action due to high levels of lead and arsenic.
- Whitdelph Mine – This abandoned mine and mill were investigated by IDEQ. IDEQ determined No Further Action (NFA) after assessment due to low likelihood of contamination.

The information provided above was compiled from the Idaho Waste Management and Remediation Divisions Waste Remediation Facility Mapper.

https://idaho.terradex.com/

6.4 Watershed Control Measures

This section of the watershed control program describes how the City of Clark Fork, in coordination with other local agencies, monitors and manages activities and land use to minimize or eliminate source water quality impacts. The City of Clark Fork does not own all the land within its watershed and must also rely on other local entities with land use authority.

6.4.1 Land Use Restrictions

- The City of Clark Fork owns the property surrounding the groundwater well at Spring Creek. The well is located 20 feet West of the intersection of Spring Lane and East Spring Creek Road adjacent to Spring Creek Road. The wellhead is located inside a building surrounded by a locked gate with perimeter fence to provide controlled access to prohibit degradation of the source.
- Bonner County has jurisdiction for land-use planning activities within the assessment area. Requests to change land-use designations within the area are to be made only with the consultation of the City of Clark Fork.

6.4.2 Regulation of Agriculture, Timber Harvesting and Construction Practices

- The DEQ assumes the primary enforcement role to ensure that agricultural operations do not degrade water quality. Their enforcement is triggered by documented water quality degradation, and usually initiated by a complaint. Generally, enforcement actions are used as a last resort only. Farm owners are encouraged to work with the NRCS and the Bonner County Conservation District to develop and implement farm plans and install Best Management Practices (BMPs) to protect water quality.
- Under IDAPA 20.02.01, the Idaho Department of Lands (IDL) has the authority to regulate timber harvest under the Timber-Open Space program. The IDL also has the land use authority to limit the conversion of Open Space into commercial or residential uses.

6.4.3 Inspection, Surveillance, Monitoring

- The City of Clark Fork conducts daily inspections of the wellhead, water treatment building, storage tank and associated water infrastructure.
- The City conducts water quality monitoring per DEQ requirements.
- The City performs quarterly “windshield” surveys of the watershed to determine changes in land use and assess general health of the watershed.

6.4.4 Contamination Source Controls

- Bonner County recommends use of the IDEQ’s “A landowners and Contractors Best Management for the Control and Treatment of Stormwater, Erosion and Sedimentation” as part of its development code that requires developers to prepare and submit a Stormwater Site Plan that analyzes potential water quality impacts, the effectiveness of proposed BMPs and create an erosion and sediment control plan.

6.4.5 Public Education

The City of Clark Fork leads community education programs within the Spring Creek Assessment Area.

- The City distributes the Consumer Confidence Report which is issued to water users once per year which includes descriptions of the City's water source and ways to protect it.
- The Bonner County Extension provides education programs to residents regarding farm and residential water use, water quality and waste management. Additional information can be found at: https://www.uidaho.edu/extension/county/bonner

6.4.6 Watershed Control Activities

The City of Clark Fork has identified the following watershed control activities to be implemented to reduce the potential of degradation of the water supply.

- Establish sanitary control area adjacent to the Spring Creek Wellhead.
- Install locking gate and fencing to limit access to the wellhead.
- Install additional high visibility signs, "Water Supply Protection Area", adjacent to wellhead.
- Establish better communications with Bonner County to keep abreast of development within the watershed control area.
- Contact landowners within the watershed with an informational letter identifying the City's use of the water as it sole source.
- Develop a public awareness program to educate landowners about activities in the watershed that could be detrimental to the water supply.

6.5 System Operation and Emergency Provisions

6.5.1 System Operation

The system operation ensures that the water delivered to customers continuously meets drinking water regulations. Key components of the system are described in detail in Chapter 3.

6.5.2 Emergency Response

For emergency response procedures to be properly executed, coordination, cooperation, and communication among the responding agencies, organizations, and individuals are imperative. There are emergency response organizations at the local, state and federal levels. Depending on the magnitude and type of release, any of the following organizations may be involved in emergency response for a watershed protection area in Idaho:

- DEQ: DEQ is responsible for determining the source and cause of the release and the responsible party. If the responsible party is unknown, DEQ will investigate to determine who is responsible and ensure that containment, clean up and disposal proceedings begin. The DEQ's 24 Hour Spill Response Team can be contacted at 911.
- Local Fire Department: The City of Clark provides fire and emergency response service through a group of local volunteers. Since the City's Fire Department is volunteer based, the fire

department will respond only to 911 calls or, possibly the fire chief, Richard Harter who can be reached at the department line (208-266-1337), or at the City Hall (208-266-1315).

An emergency contact list for the City of Clark Fork can be found in Appendix J

6.5.3 Contingency Planning

A contingency plan is needed if a contamination event or natural disaster results in a temporary or permanent loss of the Spring Creek well. The contingency plan identifies the amount of water required to sustain the community daily and the alternative sources of supply for both short term and long-term emergencies. If the Spring Creek Well goes off-line due to pipe maintenance or cleaning, the 122,000-gallon reservoir would adequately supply water to the residents for approximately 1.3 days under average day consumption conditions (101,000 gpd).

In the event of contamination at the source, or within the distribution system, the City of Clark Fork's options are limited since the wellhead is the City's only source of water. The City would have to notify the IDEQ requesting assistance and then issue a health advisory. The health advisory would be issued and residents would have to make the choice between using their own bottled water and possibly boiling the available tap water.

Alternate temporary sources of drinking water for the City of Clark include the well on 9th Avenue or a new well located somewhere within the city limits.

Alternatives that may be considered in the future to develop a local (secondary) emergency water source include the following:

- Upgrade secondary water source (9th Avenue Well) with current treatment technologies.
- Construct additional storage capacity within the system.

7. OPERATIONS AND MAINTENANCE

7.1 Water System Management and Personnel

The system is currently managed and operated by the following personnel:

Name	Phone Number	Responsibility
Russ Schenck	208-290-42891	Mayor
Ben Dooley	208-610-6877	Maintenance
Eric Babcock	208-266-0349	Maintenance
Robert Hansen (WSM)	208-265-4270	Contracted System Operator
Jay Solomon (WSM)	208-265-4270	Contracted System Operator
Edward Huckaby (WSM)	208-265-4270	Contracted System Operator

7.2 Operator Certification

The City of Clark Fork has contracted out the operations of the water system to Water Systems Management Inc. (WSM), a full-service water system management company based out of Sandpoint Idaho. See Appendix D-1 for the relevant operator certifications.

7.3 Routine Operating Procedures and Preventive Maintenance

The following is a general listing of routine operation and preventative maintenance tasks performed by City staff:

Daily

The following routine and preventative maintenance activities will be performed daily:

- Facility Inspections.
- Visual and aural inspections of building exteriors, interiors and equipment.
- Visual inspections of chlorine settings.
- Chlorine residual level monitoring.
- Pumping and distribution data totals.
- Security of all facilities.

Weekly

The following routine and preventative maintenance activities will be performed weekly:

- Routine sampling and testing.
- Check and clean chlorination system and turbidity meter.

Monthly

The following routine and preventative maintenance activities will be performed monthly:

- Read meters (meters have been read randomly in the past) but the City has started a bi-annual (April and October) meter reading program.
- Verify meter readings showing high consumption.
- Notification to consumer of possible leaks.
- Distribution of shut off notices.
- Meter “turn-offs” for lack of payment (rare occasion).
- Meter “turn-ons” for payment.
- Calibrate chlorine residual and turbidity meters .
- Flushing dead-end mains.

Annually

The following routine and preventative maintenance activities will be performed annually:

- Hydrant inspection and flushing (as needed).
- Exercise all distribution valves.
- Service line replacements, as needed.
- Cross connection control device testing.
- Preventative maintenance on chlorination and booster pumps.
- Reservoir hatches, vent and overflows cleaning.
- Update inventory of all water department equipment.
- Update cross connection control records (inspect backflow prevention devices).
- Capital improvement program purchase(s) and preparation of preliminary budget for next fiscal year.

Every Five Years

The following routine and preventative maintenance activities will be performed every five years:

- Inspect and clean reservoir.

Every Ten Years

The following routine and preventative maintenance activities will be performed every ten years:

- Source meter calibration check.
- Fire hydrant maintenance.

The operation, control and maintenance practices and recommended preventative maintenance activities for specific system components are discussed in the following sections.

Spring Creek Wellhead

Description:

The City of Clark Fork obtains its drinking water from a well adjacent to Spring Creek, a ground water source. The source is located 50 feet west of the intersection of Spring Lane and Spring Creek Road adjacent to Spring Creek Road.

If the spring creek wellhead goes off-line due to pipe maintenance or cleaning, the 122,000-gallon reservoir would adequately supply water to the residents for approximately 1 days under average day consumptions conditions (94,000 GPD) if the tank were full at the start of the outage.

Existing Maintenance Practices:

Proposed Improvements to Existing Maintenance Practices

No changes to the existing maintenance practices are proposed.

Water Treatment Plant

Operation:

The City of Clark Fork has a General Operation and Maintenance Manual Titled Water Treatment Plant Operation 5th Edition – A Field Study Training Program Volume 1, and it has sections that are roughly outlined below:

1. Provide normal lubrication of pumps, motors and valves (per manufacturer's manuals).
2. Perform routine maintenance of chlorine feed system per the manufacturer's instructions.
3. Little to no maintenance is expected to be performed in the control panel and associated equipment. Reset circuit breaker in the event of failure following determination/cause of failure.
4. All electronic water quality monitoring instruments, such as the chlorine residual analyzer and turbidity meter, shall be calibrated in accordance with the manufacturer's instructions (minimum quarterly or more frequent intervals).

The Water Treatment building is equipped with a mobile back-up diesel powered generator in the event of an extended power outage.

Proposed Improvements to Existing Maintenance Practices

No changes to the existing maintenance practices are proposed.

7.3.1 Concrete Reservoir

Description:

The concrete reservoir contains a total of 122,000 gallons of storage and is located above grade northeast of the intersection of HWY 200 and E Spring Creek Rd. and serves the gravity zone. The overflow elevation of the steel Reservoir is 2227.25 feet North American Vertical Datum of 1988 (NAVD88 datum).

The water tank is equipped with an exterior lockable galvanized steel ladder, a lockable access hatch on the roof, and an access man-way at the base of the tank. The reservoir is equipped with individual inlet, outlet, and drain pipes with appropriate valves to service (clean, paint, etc.) the reservoir when needed. The tank vent is screen is cleaned or replaced as required. The reservoir overflow discharges to a catch

basin with an outlet pipe which drains to Spring Creek. The reservoir is also equipped with a pressure transducer that relays tank water level information to the Water Treatment Building.

Operation:

The City checks the site monthly to ensure proper operation and verify that the site has not been vandalized.

Existing Maintenance Practices:

The City performs the following preventative maintenance activities:

- The City inspects the exterior of the reservoir on a regular basis and will hire a diver to inspect the interior of the tank on an as needed basis.
- The City checks the condition of the exterior vent and screens annually.
- It is recommended that the tank be drained and cleaned at least once every four to 5 years.

Proposed Improvements to Existing Maintenance Practices

No changes to the existing maintenance practices are proposed.

7.4 Water Quality Sampling Procedures and Program

The City of Clark Fork's water quality sampling program is described in Section 4.9.

7.5 Coliform Monitoring Plan

A Revised Total Coliform Monitoring Plan has been developed for the City of Clark Fork in accordance with the Small Public Water Systems rule IDAPA 58.01.08. A copy of this plan is included in Appendix E-4.

7.6 Emergency Programs, Service Reliability and Water Shortage Plan

Please see Appendix D-3 for a copy of the Emergency Response Plan Guidance for Small and Medium Community Water Systems, EPA 2004.

7.7 Sanitary Survey Findings

A sanitary survey was performed by DEQ on September 5, 2013. The inspector found that the water system was well built, properly maintained and in compliance with the Idaho Rules for Public Drinking Water Systems.

The following deficiencies and requirements were identified:

1. The water system must ensure that cross connections do not exist or are isolated from the potable water system by an approved backflow prevention assembly. Backflow prevention assemblies shall be inspected and tested annually for functionality by an Idaho licensed tester, as specified in Subsection 552.06.c. Annual backflow testing of all backflow assemblies installed on underground sprinkler systems within distribution is required.
2. Please complete the enclosed Financial and Managerial Capacity forms and return to the Department along with your plan of corrections.

3. It is required that any dead-end distribution mains must be flushed every six months.

Follow Up Items:

1. If at any time there is a depressurization event, the District must provide public notification and notify the DEQ.

Recommendations:

1. The Department strongly recommends that the City of Clark Fork develop a plan for financing the needed repairs and upgrades to their water system. It was discussed that the 4-inch lines on all fire hydrants be replaced with 6-inch lines to correct the problem of low fire flows; replace deteriorating lines/mains to 6-inch lines with the priority on locating and replacing the leaking lines; repair and replace valves in distribution system; repair and add an additional reservoir; change the corrosion control chemical to sodium bicarbonate (soda wash) which is much safer to work with than the current 25 percent sodium hydroxide (caustic soda) solution.
2. The Department recommends that an additional eye wash station be added in the chemical room at the Spring Creek Well house.
3. The Department recommends the reservoir be inspected and cleaned ever five years.
4. The Department recommends the valves in distribution be exercised annually.
5. The Department recommends an operation and maintenance manual be provided for the drinking water system. Operation and maintenance manuals should include daily operating instructions, trouble shooting, operator safety procedures, location of valves and other key system features, parts lists and parts order forms, and information for contacting the water system operator.

7.8 Safety Procedures

All work on the water system follows Occupational Safety and Health Administration (OSHA), and local safety requirements. This includes but is not limited to confined space entry, trenching/underground, electrical, and fall hazard work such as on reservoirs.

Additionally, the City of Clark Fork currently conducts semi-annual safety meetings to address the following issues:

- Monthly safety meetings.
- Material chemical safety.
- Emergency response materials.
- Proper maintenance of equipment used every day and during emergency situations.
- Discuss any accidents that may have occurred and how to avoid future problems and mishaps.
- Unfinished reporting and documentation of work projects.

The use of Sodium Hypochlorite (bleach) for disinfection of the City's water supply is a hazard to personnel. The City has appropriate training and education to mitigate the potential danger of this chemical. City staff are familiar with the Safety Data Sheet (SDS) for this chemical.

The following are the procedures the City follows when handling this chemical:

Sodium Hypochlorite is considered a hazardous material at any strength. Even though it is largely composed of water, it is handled with care by using aprons or chemical resistant clothing and goggles in a well-ventilated area. It is stored in well vented, closed containers that provide protection from direct sunlight. It is separated from incompatible substances and should not be stored near acids, heat or oxidizable materials or organics. When handling, it is not mixed with other cleaning agents that may liberate chlorine gas vapors (e.g., acidic agents).

This product should be stored and handled in accordance with the National Fire Protection Association 430 Code for the Storage of Liquid and Oxidizing Materials.

7.9 Record Keeping, Reporting, and Customer Complaint Program

Record Keeping

The City shall retain records of the following:

1. Daily source meter readings for 10 years minimum.
2. Project reports, construction documents and related drawings, inspection reports and approvals for the life of the system.
3. Daily chlorine test records for 3 years minimum.
4. Bacteriological sampling records for 5 years minimum.
5. Chemical sampling records for as long as the system is in operation.
6. Records of action taken to correct violations and public notifications for 3 years minimum.
7. Sanitary survey reports, summaries or communications with IDEQ for 10 years minimum.
8. Cross connection control records for service connections if the premise poses a hazard.
9. Backflow assembly inventory information for the life of the assembly or 5 years minimum.
10. Backflow incident records and annual summary reports (if any) for 5 years minimum.

Reporting

The City shall report to IDEQ within twenty-four hours the failure to comply with any national primary drinking water regulation (including failure to comply with any monitoring requirements). For violations and situations with significant potential to have serious adverse effects on human health because of short term exposure, IDEQ must be notified as soon as possible, but no later than twenty-four hours after the violation is known.

The City shall submit to IDEQ reports required under IDAPA 58.01.08.100, including tests, measurements, and analytic reports. Monthly reports are due before the tenth day of the following month, unless otherwise specified in this chapter. City staff shall submit to DEQ copies of any written summaries or communications relating to the status of monitoring waivers during each monitoring cycle or as directed by DEQ. Source meter readings shall be made available to DEQ.

The City shall notify DEQ within thirty days of any change in name, category, ownership, or responsibility for management of the water system, or addition of source or storage facilities. The City shall notify DEQ of the presence of fecal coliform or E. coli in a sample, by the end of the business day in which the City is

notified by the laboratory. If the City is notified of the results after normal close of business, then the City shall notify DOH before the end of the next business day.

The City shall report disinfection by-products information to IDEQ as specified in 40 CFR 141.134. The City shall submit to IDEQ a certification that the system has complied with the public notification regulations when a public notification is required. Along with the certification, the City shall submit a representative copy of each type of notice.

The Consumer Confidence Report is published to the customers on the water system annually. The 2018 Report is in Appendix D-5.

Customer Complaints

Customer complaints are directed to the water system superintendent. Upon receipt and resolution of the customer complaint, the water system superintendent completes an incident report form. The form documents actions that occur out of the ordinary such as unusual water quality incidents or consumer complaints. Water quality complaints refer to both specific water parameters and the general aesthetics characteristics of the water that might result in consumer complaints. The water system superintendent gathers and records the following information on the incident form:

- Date and time of incident
- Location of incident
- Type of incident
- Customer contact information
- Method of discovery
- Response action(s) taken
- Notification(s) made
- Assessment of any threat to the system

All customer complaints and incident reports are reviewed by the City Council and the water system operator.

7.10 O & M Deficiencies

Based on conversations with the water treatment system operator and the water distribution system operator there are several issues with the systems O&M that will require system upgrades to mitigate. These include long dead-end services that take upwards of 15 minutes to flush out, unknown pipe integrity, and undersized pipelines. Also, the operator noted that all the valves within the system are not currently working as they have seized up from disuse. All valves within the system will need to be replaced on a typical 3 per intersection basis or on a basis that allows the system to be functional during repairs and routine maintenance. This means that any section of pipe will need at maximum 4 valves to isolate it from the rest of the system.

8. CAPITAL IMPROVEMENT PROGRAM

8.1 Capital Improvement Program and Schedule

Capital Improvement Projects (CIP) for the planning period are presented in this section. Rather than set up specific projects for the 20-year planning period, projects are set up broadly into 4 separate tasks as there could be considerable cost savings by doing much larger projects that will have a more immediate impact on the performance of the system. See Table 8-1 below for the 5 projects that were identified in the water modeling analysis. Detailed diagrams for the CIPs are provided in Appendix F-2. The total cost of all the projects during the 20-year planning period is approximately $5,300,000.

Table 8-1. Capital Improvement Program Schedule and Costs

Improvement	Type	Components	Total Cost[1]
Cast in Place Concrete Water Tank and 9th Ave Well Rehabilitation	CIP	~220,000 Gal cast in place concrete water tank, altitude valves, distribution mains and new isolation valves to connect to system across the bridge over lightning creek. Upgraded existing well on 9th Ave with new pump, pump house building, treatment system and re-cased well shaft. Revise piping from tank to cross under HWY bridge.	$1,500,000
Continuous Water Line and Valve Replacement North Half of City	CIP	Replacement of existing undersized cast iron and galvanized steel water lines in a grid pattern to provide required fire hydrant coverage on the north side of the highway.	$2,000,000
Continuous Water Line and Valve Replacement South Half of City	CIP	Replacement of existing undersized cast iron and galvanized steel water lines in a grid pattern to provide required fire hydrant coverage on the south side of the highway.	$1,800,000
Water Treatment Plant	CIP	Installation of a water treatment plant located near the 9th Ave well to treat for softer, better tasting water.	

1. Total cost includes topographic surveying, engineering design and construction engineering professional services (if applicable). Opinions of probable costs are shown in 2018 dollars.

The projects shown in the above table are more general as the City's existing system is currently in a degraded state and most if not all the valves and pipes should be replaced. The City will likely save a considerable amount of money by contracting out large projects. This will require considerable loans on the City's part to acquire funding, but securing it once will make a major difference in the system's operation. The "No Action" Alternative was discussed at the end of Chapter 4 and was found to be very risky and potentially more costly in the end. Separating the City into separate pressure zones was not considered as the city is very flat and the required upgrades would limit the availability of fire flow throughout the system.

9. FINANCIAL PLAN

9.1 Introduction

The effective implementation of a water facility plan (WFP) is dependent upon accurately developing a document which can be financially supported by the water system, meeting State and local regulatory requirements, and providing the flexibility to deal with unforeseen changes. The discussion below presents elements of this WFP addressing each of these issues.

This chapter will develop a financial plan which reviews the sources of funds (revenues) and applications of funds (expenses) for the City of Clark Fork. The financial plan will include projected operating and capital costs of the system for the six-year projected period of calendar year (CY) 2019 to 2025. The capital costs contained within this financial plan utilize the capital improvements plan developed as part of this water plan. The results of the financial plan will outline the annual operating and capital needs of the water system and determine if the current water revenues are sufficient to cover costs. The City of Clark Fork has relied and will continue to rely on state and federal grants and low interest rate loans to assist in paying for water system improvements.

9.2 Past Financial History

Available financial information from the City was analyzed to determine the availability of funding for the water system. Available financial information indicates that the City manages to maintain a profit from year to year.

The City of Clark Fork's water fund includes subcategories for water revenues and expenditures as provided in Table 9-1, the backup data for the table are provided in Appendix F-1. The City has also provided their September 2017 Local Government Investment Pool monthly balance showing a positive balance of $360,654.36.

Provided below in Table 9-1 is a summary of the financial history for years 2011 to 2017 for the City. As can be seen from the Table, the City's water system operating expenses have not exceeded their revenue for the past two years where revenue data was available. In 2018, the City implemented a new water rate structure that raised monthly water rates per Resolution 6-2018 provided in Appendix A-4.

Table 9-1. Financial History 2012 to 2017

Expenditures						
Year	2012	2013	2014	2015	2016	2017
Salaries and Wages						
Clerk and Assistant	$ 5,887.94	$ 5,615.86	$ 6,933.14	$ 8,945.56	$ 8,222.15	$ 10,429.24
Maintenance	$ 9,873.84	$ 9,277.60	$ 12,191.48	$ 9,684.00	$ 10,211.56	$ 9,307.70
FICA/Medicare	$ 988.53	$ 877.41	$ 1,288.86	$ 1,431.97	$ 1,395.26	$ 1,509.89
Unemployment	$ -	$ -	$ -	$ -	$ -	$ -
Retirement	$ 1,577.18	$ 1,627.65	$ 1,991.23	$ 1,556.85	$ 2,618.00	$ 1,341.22
Workers Comp	$ 590.40	$ 274.60	$ (22.00)	$ 15.00	$ 636.30	$ 554.40
System Expenses						
Repair and maintenance	$ 2,471.41	$ 6,946.53	$ 10,561.01	$ 11,662.63	$ 9,241.59	$ 10,705.00
Insurance	$ 1,278.60	$ 763.40	$ 1,240.00	$ 1,090.10	$ 1,252.60	$ 1,252.60
Telephone	$ 1,093.02	$ 901.18	$ 1,302.19	$ 1,029.74	$ 1,071.71	$ 1,149.52
Utilities	$ 5,033.33	$ 5,331.08	$ 4,011.67	$ 3,046.40	$ 3,678.15	$ 2,493.30
DEQ Water Fee Assessment	$ 3,168.00	$ 1,056.00	$ 528.00	$ 264.00	$ 1,056.00	$ 1,107.00
Water Treatment/Testing	$ 7,814.32	$ 7,477.93	$ 10,489.87	$ 4,373.87	$ 5,019.18	$ 7,309.75
Professional Fees						
Audit	$ 2,041.25	$ 4,001.25	$ 2,550.00	$ 3,501.26	$ 1,666.75	$ 1,937.50
Legal	$ -	$ 70.00	$ 175.85	$ 30.00	$ -	$ -
Engineering	$ -	$ -	$ -	$ -	$ 10,780.00	$ 17,580.00
Back-up Operator	$ 1,300.00	$ 1,100.00	$ 1,100.00	$ 1,300.00	$ 1,200.00	$ 1,462.50
Other Professional	$ -	$ -	$ -	$ -	$ -	$ 75.00
Misc. Expeditures						
Travel	$ -	$ -	$ -	$ -	$ -	$ -
Office Expenses	$ 2,677.53	$ 2,532.00	$ 6,079.27	$ 3,251.95	$ 3,084.71	$ 3,374.59
Interest Expenses	$ 4,534.82	$ 4,946.94	$ 4,357.08	$ 4,395.92	$ 3,538.83	$ 3,517.59
Leases	$ 200.00	$ 200.00	$ 200.00	$ 200.00	$ 200.00	$ 200.00
(Depreciation) Reserve	$ 21,926.00	$ 21,136.03	$ 21,169.35	$ 21,123.00	$ 22,934.84	$ 23,038.97
Legal Notices and Printing	$ 68.75	$ -	$ 75.85	$ -	$ -	$ -
Dues, Training and Subscriptions	$ 585.00	$ 264.00	$ 1,438.00	$ 1,488.00	$ 759.99	$ 709.00
Miscellaneous	$ 2,388.34	$ 75.68	$ 223.99	$ 395.01	$ -	$ -
Gas and Oil	$ 1,020.87	$ 799.37	$ 1,921.36	$ 842.29	$ 508.39	$ 752.31
CIP	$ -	$ -	$ -	$ -	$ -	$ 2,947.84
Equipment	$ -	$ -	$ -	$ 601.96	$ 561.50	$ 173.07
Bonner County Treasurer	$ -	$ -	$ -	$ 45.00	$ 25.00	$ 25.00
Sub Total Expenses	**$ 76,519.13**	**$ 75,274.51**	**$ 89,806.20**	**$ 80,274.51**	**$ 89,662.51**	**$ 102,952.99**
Revenue						
Year	2012	2013	2014	2015	2016	2017
Water Sales	$ 90,000.10	$ 104,259.99	$ 110,308.39	$ 136,233.14	$ 124,132.35	$ 131,310.37
Water Hook Up Fees	$ 10,000.00	$ -	$ -	$ 1,150.78	$ 5,000.00	$ 5,000.00
Interest	$ 559.25	$ 205.97	$ 143.22	$ 268.70	$ 681.98	1358.16
Misc and Donations	$ -	$ 113.25	$ 750.00	$ 4,566.00	$ -	$ 18,247.50
Sub Total Revenue	**$ 100,559.35**	**$ 104,579.21**	**$ 111,201.61**	**$ 142,218.62**	**$ 129,814.33**	**$ 155,916.03**
Net Revenue/(Deficiency)	**$ 24,040.22**	**$ 29,304.70**	**$ 21,395.41**	**$ 61,944.11**	**$ 40,151.82**	**$ 52,963.04**

9.3 Development of the Six Year Financial Plan

The development of the six-year financial plan is intended to demonstrate the City's ability to meet its operation and maintenance expenditures, while maintaining sufficient rate levels to support those needs. As previously stated, the financial plan was developed to review the projected revenues and expenses of the water system for CY 2013-2018.

In developing the financial forecast, two components were reviewed; revenues and expenditures. The City's CY 2017 water system budget was used as a starting point. Projections for future years expenses were obtained by applying an assumed annual escalation (inflation) factor of 2 percent upon each year.

The first component of the financial plan reviews the sources of funds of the water system. There are two primary types of revenues received from operations:

- Residential rate revenues – received from water sales to active residential services, and
- Commercial rate revenues – received from water sales to active commercial services.

Total water rate revenues for the City of Clark Fork are projected to be $143,792.57 in CY 2018 based on the rate increase that took place in June 2018 and the current amount of active residential 229 service connections and active commercial 52 service connections. Revenue growth is expected since the rates are projected to increase at 5% per year. The current City Council will likely need to evaluate an additional rate increase depending on the funding source for the CIP projects shown later in this chapter.

The second part of the financial plan involves distributing the funds from the revenue analysis. This involved taking the latest expenditure data and projecting the costs of running the system for the next 6 years. This would also involve some of the Capital Improvement Projects discussed in Chapter 8.

Table 9-2 below provides a projection of expenses and revenues for the six-year planning period of CY 2018-2024. It includes the loan services for the selected Capital Improvements Projects at $5,300,000 over 40 years at 3 percent interest with an assumed $750,000 in grants to offset costs. To compensate for this additional cost, the 2020 revenues would have to increase by 79% to meet the $195,456 yearly loan payments.

Table 9-2. 6-Year Financial Plan

Expenditures								
Year	Reference year 2017	2018	2019	2020	2021	2022	2023	2024
Salaries and Wages								
Clerk and Assistant	$ 10,429.24	$ 12,469.74	$ 12,719.13	$ 12,973.52	$ 13,232.99	$ 13,497.65	$ 13,767.60	$ 14,042.95
Maintenance	$ 9,307.70	$ 8,265.36	$ 8,430.67	$ 8,599.28	$ 8,771.27	$ 8,946.69	$ 9,125.63	$ 9,308.14
FICA/Medicare	$ 1,509.89	$ 1,586.24	$ 1,617.96	$ 1,650.32	$ 1,683.33	$ 1,717.00	$ 1,751.34	$ 1,786.36
Unemployment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Retirement	$ 1,341.22	$ 2,347.22	$ 2,394.16	$ 2,442.05	$ 2,490.89	$ 2,540.71	$ 2,591.52	$ 2,643.35
Workers Comp	$ 554.40	$ 80.25	$ 81.86	$ 83.49	$ 85.16	$ 86.87	$ 88.60	$ 90.37
System Expenses								
Repair and maintenance	$ 10,705.00	$ 8,530.98	$ 8,701.60	$ 8,875.63	$ 9,053.14	$ 9,234.21	$ 9,418.89	$ 9,607.27
Insurance	$ 1,252.60	$ 626.30	$ 1,644.00	$ 1,676.88	$ 1,710.42	$ 1,744.63	$ 1,779.52	$ 1,815.11
Telephone	$ 1,149.52	$ 1,249.92	$ 1,274.92	$ 1,300.42	$ 1,326.43	$ 1,352.95	$ 1,380.01	$ 1,407.61
Utilities	$ 2,493.30	$ 2,633.99	$ 2,686.67	$ 2,740.40	$ 2,795.21	$ 2,851.12	$ 2,908.14	$ 2,966.30
DEQ Water Fee Assessment	$ 1,107.00	$ 837.00	$ 853.74	$ 870.81	$ 888.23	$ 906.00	$ 924.12	$ 942.60
Water Treatment/Testing	$ 7,309.75	$ 4,210.44	$ 4,294.65	$ 4,380.54	$ 4,468.15	$ 4,557.52	$ 4,648.67	$ 4,741.64
Professional Fees								
Audit	$ 1,937.50	$ 1,987.50	$ 2,027.25	$ 2,067.80	$ 2,109.15	$ 2,151.33	$ 2,194.36	$ 2,238.25
Legal	$ -	$ 1,517.00	$ -	$ -	$ -	$ -	$ -	$ -
Engineering	$ 17,580.00	$ 1,924.00	$ -	$ -	$ -	$ -	$ -	$ -
Back-up Operator	$ 1,462.50	$ 6,262.96	$ 6,600.00	$ 6,600.00	$ 6,600.00	$ 6,600.00	$ 6,600.00	$ 6,600.00
Other Professional	$ 75.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Misc. Expeditures								
Travel	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Office Expenses	$ 3,374.59	$ 3,325.04	$ 3,391.54	$ 3,459.37	$ 3,528.56	$ 3,599.13	$ 3,671.11	$ 3,744.54
Interest Expenses	$ 3,517.59	$ 3,224.88	$ -	$ -	$ -	$ -	$ -	$ -
Montana Rail Link Lease	$ 200.00	$ 200.00	$ 200.00	$ 200.00	$ 200.00	$ 200.00	$ 200.00	$ 200.00
Depreciation	$ 23,038.97	$ 25,000.00	$ 25,500.00	$ 26,010.00	$ 26,530.20	$ 27,060.80	$ 27,602.02	$ 28,154.06
Legal Notices and Printing	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Dues, Training and Subscriptions	$ 709.00	$ 405.00	$ 413.10	$ 421.36	$ 429.79	$ 438.39	$ 447.15	$ 456.10
Miscellaneous	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Gas and Oil	$ 752.31	$ 885.01	$ 902.71	$ 920.76	$ 939.18	$ 957.96	$ 977.12	$ 996.67
Equipment	$ 173.07	$ 2,238.22	$ 2,282.98	$ 2,328.64	$ 2,375.22	$ 2,422.72	$ 2,471.18	$ 2,520.60
Bonner County Treasurer	$ 25.00	$ 25.00	$ 25.00	$ 25.00	$ 25.00	$ 25.00	$ 25.00	$ 25.00
CIP Reference Year	$ 2,947.84	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sub Total Expenses	**$ 102,952.99**	**$ 89,832.05**	**$ 86,041.95**	**$ 87,626.29**	**$ 89,242.31**	**$ 90,890.66**	**$ 92,571.97**	**$ 94,286.91**
Capital Improvement Projects								
	Project Cost	2018	2019	2020	2021	2022	2023	2024
Loan Funding For the Following:								
Cast In Place Concrete Water Tank	**$ 900,000.00**							
Refurbishment of Existing Well on 9th St and New Piping Routing	**$ 600,000.00**							
Water Line and Valve Replacement North Half of City	**$ 2,000,000.00**							
Water Line and Valve Replacement South Half of City	**$ 1,800,000.00**							
Total Cost: *	**$ 5,300,000.00**			**$195,456**	**$195,456**	**$195,456**	**$195,456**	**$195,456**
Revenue								
Year	2017	2018***	2019	2020	2021	2022	2023	2024
Water Sales	$ 131,310.37	$ 133,281.09	$ 139,945.14	$ 146,942.40	$ 154,289.52	$ 162,004.00	$ 170,104.20	$ 178,609.41
Water Hook Up Fees	$ 5,000.00	$ 5,000.00	$ 5,118.50	$ 5,239.81	$ 5,363.99	$ 5,491.12	$ 5,621.26	$ 5,754.48
Interest	1358.16	$ 5,511.48	$ 5,642.10	$ 5,775.82	$ 5,912.71	$ 6,052.84	$ 6,196.29	$ 6,343.14
Misc and Donations	$ 18,247.50	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Sub Total Revenue	**$ 155,916.03**	**$ 143,792.57**	**$ 150,705.75**	**$ 157,958.03**	**$ 165,566.22**	**$ 173,547.95**	**$ 181,921.75**	**$ 190,707.03**
Net Revenue/(Deficiency)	**$ 52,963.04**	**$ 53,960.52**	**$ 64,663.80**	**$ (125,124.26)**	**$ (119,132.09)**	**$ (112,798.70)**	**$ (106,106.23)**	**$ (99,035.88)**

*the loan is assumed to be acquired in 2019 with payments beginning in 2020.
**Loan amount is for $4,550,000 at 3% for 40 years with $750,000 in grants
***Year 2018 started new water rates per Appendix A-4b, the revenues have been increased by the % change (~22%)
Note: Yearly increases for costs increase by 2% per year and revenues by 2%+0.37%.

9.4 External Sources of Funding

The CIP listed in Table 8-1 and Table 9-2 will require external sources of funding. Most available sources of funding provide loan interest loans over varying periods of time for payment of principal and interest. A few of the available funding sources are discussed below.

Table 9-3 provides a summary of the contacts for the various funding agencies. Depending on the source, the City will need to supplement these funds with other sources of revenue with other varying requirements to ensure that construction of the recommended capital improvement projects occurs. Additional information on funding agencies is provided in Appendix F-3.

Table 9-3. Funding Agency Contacts

Program	Address	Phone	Internet
Community Development Block Grant	Idaho Department of Commerce 700 West State Street, PO Box 83720 Boise, ID 83720	Dennis Porter (208) 287-0782	https://commerce.idaho.gov/communities/community-grants/community-development-block-grant-cdbg/
Rural Development	USDA-Agricultural Department 7830 Meadowlark Dr # C, Coeur d'Alene, ID 83815	Michelle Noordam (208) 209-4360	https://www.rd.usda.gov/programs-services/rural-economic-development-loan-grant-program
Drinking Water State Revolving Fund	Idaho Department of Environmental Quality 1410 N. Hilton Boise, ID 83706	Tim Wedland (208) 373-0439	http://www.deq.idaho.gov/water-quality/grants-loans/

Community Development Block Grant (CDBG)

Funding is available for final design and construction of domestic wastewater, drinking water, service connections, stormwater, streets, bridges, community facilities, economic development, and housing rehabilitation projects.

Types of CDBG funding available:

- Grant
  - Typically $300,000 to $500,000 per grant
  - No match required, but local contribution and gap financing preferred

Rural Development (RD)

Funding for pre-construction and construction associated with building, repairing, or improving drinking water, solid waste facilities and wastewater facilities.

Types of RD funding available:

- Loans (grants in some cases)
  - Interest rates vary (currently 2.125 – 3.5 percent)
  - Up to 40-year loan term
  - No pre-payment penalty
  - Grant must have match funds of varying fractions depending on the project and need

Idaho DEQ

In August 1996 Congress reauthorized the SDWA and appropriated funding for states to develop their Drinking Water State Revolving Fund (DWSRF) loan programs. Each state receives annual allocations in the form of a Capitalization Grant.

DWSRF loans are available to all community public water systems, and non-profit, non-community public water systems, except federally and state-owned systems. The loans may be used to address SDWA health standard violations, replace infrastructure for SDWA compliance, or consolidate supplies and acquire property if needed for SDWA compliance.

9.5 Review of Water Rates

The City has adopted new water rates to meet their financial requirements as of 2015. These water rates were implemented to start to increase the rate revenue as a change in rate structure had not been made in several years. This section will outline the rates that a typical customer currently pays and show what those rates would need to be to make the required loan payment as shown in Table 9-2. The typical rates for the average customer are as follows:

- Single-family residences: $38.78 per month per each service connection.
- Commercial (irrigated): $69.77 per month for each service connection – assumed 1-inch meter.
- Commercial (non-irrigated): $55.76 per month for each service connection – assumed 1-inch meter.

To calculate these average water bills, the average water use was taken from Table 3-6 and converted to a monthly water usage for each type of customer. This usage was then used in conjunction with the City's water rates to calculate the average bill.

A copy of the City's ordinance (No. 6-2018) that has set their current water rates is provided in Appendix A-4.

For the City to make the payment described above and previously in this chapter, rate revenues would have to increase by at minimum 79 percent (this payment assumes a $4,550,000 loan at 3 percent interest over 40 years and $750,000 in grant funding). To illustrate how this would affect the typical water bill, the adjusted water bills are shown below.

- Single-family residences: $69.42 per month per each service connection.
- Commercial (irrigated): $124.89 per month for each service connection – assumed 1-inch meter.
- Commercial (non-irrigated): $99.81 per month for each service connection – assumed 1-inch meter.

10. ADMINISTRATIVE ITEMS

10.1 Meetings

The City of Clark Fork has an "open meeting policy". Water customers are welcome to attend City Council meetings. City Council meetings are held on the second Monday of every month at 7:00 pm in the City Hall meeting room.

10.2 Water System Plan Adoption

An informational meeting (open house) was held on (to be determined), 2018. This meeting was publicly posted at the City Hall and Post Office. A copy of the public notice will be provided in an appendix along with a copy of the signed meeting minutes. The Water Facility Plan informational meeting was held just prior to the (to be determined) City Council meeting.

During the City's (to be determined) Council meeting, Resolution No. (to be determined) was passed which adopted this Water System Plan. A copy of this Ordinance will be contained in and appendix (ordinance to be included following DEQ acceptance of WFP). Minutes of this City Council meeting will also be included in an appendix.

Appendix A-1

City of Clark Fork's Zoning Ordinance

CITY OF CLARK FORK, IDAHO
ZONING ORDINANCE
NO. 222

AN ORDINANCE OF THE CITY OF CLARK FORK, IDAHO, A MUNICIPAL CORPORATION OF THE STATE OF IDAHO, ESTABLISHING ZONING FOR THE CITY OF CLARK FORK, IDAHO; PROVIDING FOR A SHORT TITLE; PROVIDING AUTHORITY; PROVIDING INTERPRETATION; PROVIDING SCOPE; PROVIDING DEFINITIONS; PROVIDING FOR ESTABLISHMENT OF DISTRICTS AND A ZONING MAP; PROVIDING FOR USE DISTRICTS; PROVIDING FOR DESIGNATED USES; PROVIDING FOR NON-CONFORMING USES; PROVIDING FOR STREET ACCESS; PROVIDING FOR A SCHEDULE OF FEES, CHARGES AND EXPENSES; PROVIDING FOR PENALTIES; PROVIDING FOR SEPARABILITY OF THE PROVISIONS OF THIS ORDINANCE; AND PROVIDING AN EFFECTIVE DATE AND PUBLICATION THEREOF;

WHEREAS A PUBLIC HEARING REGARDING THIS ORDINANCE WAS CONDUCTED THIS 26th DAY OF JULY, 2000 AT 6:00 P.P.M. WITH THE CITY COUNCIL ACTING AS BOTH THE GOVERNING BOARD AND THE PLANNING AND ZONING COMMISSION;

NOW, THEREFORE, BE IT ORDAINED BY THE MAYOR AND CITY COUNCIL OF THE CITY OF CLARK FORK, IDAHO:

SECTION 1.0 SHORT TITLE.

A. This ordinance shall be referred to as "Zoning Ordinance of the City of Clark Fork, Idaho."

SECTION 2.0 AUTHORITY.

A. This Zoning ordinance is adopted pursuant to authority granted by Title 76, Chapter 65 of the Idaho Code, and Article 12, Section 2 of the Idaho Constitution, as amended or subsequently codified.

SECTION 3.0 INTERPRETATION.

A. In their interpretation and application the provisions of this Ordinance shall be held to be the minimum requirements adopted for the promotion of the public health, safety and welfare, to retain and enhance upon the aesthetics of the community, to preserve and enhance land values, to separate incompatible uses and to promote security within the community. To protect the public, among other purposes, such provisions are intended to provide for adequate light, safety from fire and other danger, and for undue concentration of populations.

B. The purpose of this ordinance shall be a good general statement relative to the comprehensive plan.

SECTION 4.0 SCOPE.

A. It is not intended by this Ordinance to repeal, abrogate, annul or in any way impair or interfere with existing provisions of other laws or ordinances, except those specifically repealed by this Ordinance, or with private restrictions placed upon property by covenants running with the land to which the City is a party. Where this Ordinance imposes a greater restriction upon land, buildings or structures than is imposed or required by such existing provisions of law, ordinance, contract or deed, the provisions of this ordinance shall control.

SECTION 5.0 DEFINITIONS.

A. For the purposes of this Ordinance the following terms, phrases, words and their derivations shall have the meaning given herein. When not inconsistent with the context, words used in the present tense include the singular number, and words in the singular number include the plural number. The word " shall" is always mandatory and not merely directory.

"Accessory Use Of Buildings" is a subordinate use of building customarily incident to and located on the same lot with the main use or building.

"Alley" is any public space or thoroughfare twenty feet(20') but less than sixty (60') feet in width which has been dedicated or deeded to the public for public travel and which affords secondary access to abutting property. Access through an alley to the property shall not be considered legal access for purposes of fulfilling the requirements of this Ordinance.

"Alterations" as applied to a building or structure is a change or rearrangement in the structural parts or in the exit, facilities, or an enlargement, whether by extending on a side or by increasing in height, or in the moving from one location to another.

"Home Occupation" is any gainful operation, profession, or craft, which is customarily incidental to, carried on in a dwelling place and the use therein is clearly incidental and secondary to the use of the dwelling for dwelling purposes, and which occupation is carried on only by the immediate members of the family residing within the dwelling place. Signage for the home occupation shall be limited to a maximum of four (4) square feet.

"Non-Conforming Use." A use of premises which does not conform to the regulations of this Ordinance, but which was in existence and in conformance with the existing regulations at the effective date of of this Ordinance.

"Flood Plains." Are those areas which are subject to periodic flooding and use shall be restricted to those not susceptible to flood damage or structures which are flood-proofed and constructed above flood elevations. See current ORDINANCE for construction in flood prone areas

SECTION 6.0 ESTABLISHMENT OF DISTRICTS AND ZONING MAP.

A. Use Districts Established. For the purposes of this Ordinance the City of Clark Fork, Idaho, is hereby divided into Use Districts as hereinafter provided.

B. Maps and Boundaries. The boundaries of the Use Districts are hereby established as shown on a map entitled Zoning Map of the City of Clark Fork, Idaho.

C. As much as possible, zoning district's boundaries shall fall at the alleyway or back property line so that like uses will be facing each other.

D. Zoning across lot lines. If a lot which was platted or recorded prior to the adoption of this Ordinance is split by two different zones, the lot shall be considered, in whole, zoned to that use in which a majority of the lot is zoned.

E. Flood Plain Zoning. In a lot which is platted within a flood plain any construction of roads or structures shall as much as possible be constructed so as:

1. To prevent restriction of the natural flow and capacity that may cause added flood damage.
2. To prevent land use choices that may be detrimental to safety, health, and property.
3. To prevent burdening taxpayers with unnecessary expenditures for public work and disaster relief.
4. All buildings shall be built as per the Federal Flood Plan.
5. All structures used for human habitation shall have a first floor elevation one (1) foot or higher above the 100 year flood plain elevation or the base flood elevation as shown on the most current FEMA maps.
6. No land shall be filled without a flood plain development permit and an engineering report verifying that the fill will not alter drainage or divert flood waters to other properties
7. All structures shall meet City, State and Federal standards in effect at that time.

SECTION 7.0 USE DISTRICTS.

A. The City of Clark Fork, Idaho, is hereby divided into four use districts which shall be known as:

1. Single Family Residential (SFR)
2. Commercial (C)
3. Neighborhood Commercial (NC)
4. Light Industrial (LI)

SECTION 8.0 DESIGNATED USES.

A. Single Family Residential, (SFR). The purpose of this zone is to have land area set aside by zoning procedures and in accordance with the COMPREHENSIVE PLAN to preserve and enhance predominately single family living areas at a low density standard.

1. Uses Permitted. The following uses shall be permitted in the Single Family Residential Zone:
   (a) One single family dwelling.
   (b) Accessory buildings if constructed simultaneously or subsequent to the main building on the same lot.
   (c) Accessory uses normally incidental to single-family residences. This shall not be construed as permitting any commercial use.
2. Conditional Uses. The following conditional uses may be permitted subject to obtaining a use permit.
   (a) Churches, schools, parks, playgrounds, and public utility buildings.
   (b) Family day care facilities.
   (c) Home occupations.
   (d) Multifamily residential
   (e) In addition to the uses listed above, other uses may be permitted subject to approval upon proper application to the City Council.

B. Commercial (C) The purpose of this zone is to provide for areas that will fulfill the need for travel related services, retail sales and professional offices servicing a major highway and catering both to local and travel-related services.

1. Uses Permitted. The following uses shall be permitted in the Commercial Zone:
   (a) Automobile service stations, automobile car washes, repair garages (not including body shops), and towing services, provided

all operations, except servicing with petroleum products, air, and water, be conducted and confined within an enclosed building.

(b) Restaurants.
(c) Convenience stores.
(d) Recreational vehicle parks, when established on a site of not less than five (5) acres and at a density not to exceed fifteen (15) recreational vehicle spaces per acre.
(e) Motel and hotels.
(f) Public service facilities (for example, rest areas, parks and utility substations.)
(g) Truck service stations.
(h) On and off sale liquor establishments.
(i) Theaters.
(j) Barber and beauty shops.
(k) In addition to the uses listed above, other uses may be permitted subject to approval upon proper application to the City Council.

C. Neighborhood Commercial (NC). The purpose of this zone is to provide for areas of local commercial service needs primarily located at selected places at the perimeter of low density residential neighborhoods.

1. Uses Permitted. The following uses shall be permitted in the Neighborhood Commercial Zone.
   (a) The following uses when conducted within a building: neighborhood retail stores or shops, such as food stores, drug stores, confectioneries, beauty parlors and barber shops, variety stores, bookstores, shoe shops, offices, flower shops and restaurants.
   (b) Branch office for dry cleaning or laundry, but not dry cleaning or laundry plants.
   (c) Lodge or community halls.
   (d) Light-hardware stores.
   (e) Professional offices.
   (f) Copying and printing establishments.
   (g) City facilities.
   (h) New and used motor vehicle sales.

2. Conditional Uses. The following conditional uses may be permitted subject to obtaining a use permit.

   (a) Rooming and boarding houses.
   (b) Social halls, lodges, fraternal organizations, and clubs.

(c) Churches, libraries, parks, playgrounds, public utility and public buildings.
(d) Theaters.
(e) Family day care facilities.
(f) Convalescent and care facilities.
(g) Retail fuel sales.

3. Other Uses. In addition to the uses listed above, other uses may be permitted subject to approval upon proper application to the City Council.

D. Light Industrial (LI). The purpose of this zone is to provide areas by zoning procedures and in accordance with the COMPREHENSIVE PLAN in which industrial uses may locate, substantially free from residential and/or retail commercial activities. The Light Industrial Zone is intended for light manufacturing and less abrasive industrial activities, particularly where heavy industry may not be appropriate.

1. Uses Permitted. Industrial uses are the uses of land and buildings for manufacturing, processing fabrication, assembly, freight hauling, mini storage, warehouse and storage facilities or similar operations. All industrial operations in the Light Industrial Zone shall:
   (a) Be carried on within completely enclosed buildings and in such a manner as to provide precautions against fire and explosion hazards.
   (b) Store all raw material, finished products, machinery, and equipment, including company-owned or operated trucks, within a sight-obscuring non-pierced fence no less than six (6) feet in height.
   (c) Emit no obnoxious odors of any kind.
   (d) Exhaust no waste or dust created by industrial operation into the air.
   (e) Discharge no treated or untreated sewage or industrial waste into any waterway. Discharge and disposal of untreated and industrial waste shall comply with the standards approved by the State Department of Health.
   (f) Carry on no operation that would produce heat or perceptible glare on public highways or neighboring property.
   (g) Use any industrial or exterior lighting in a manner that produces no glare on public highways or neighboring property.
   (h) Conduct no mining, extraction, filling or soil stripping operations.
   (i) Use only oil, gas, or electricity as industrial fuel.

SECTION 9.0 NON-CONFORMING USES.

A. The lawful use of any building, structure, or land existing at the time of the enactment of this Ordinance, although such use does not conform to the provisions of this Ordinance, may be continued, but can not be expanded. If such non-conforming use is discontinued for a period of one year or more, any further use of the land, building or structure shall be in conformity with this Ordinance. The mere presence of a structure shall not be deemed to constitute the continuance of a non-conforming use unless such structure is actually occupied and employed in maintaining such use.

SECTION 10.0 STREET ACCESS.

A. No lot shall be developed without legal access to a public street. Should such street not be improved, it shall be the responsibility of the owner of the property being developed to improve the street to City standards:

1. All streets shall be built as per attachment "A".
2. Must have a recorded plat or other document dedicating public right-of-way.
3. All streets in the flood plain must comply with the requirements of the State of Idaho and Federal Flood Plans.
4. Must be constructed to form logical extension of existing streets.
5. Must comply with State and Federal regulations.

SECTION 11.0 SCHEDULE OF FEES, CHARGES AND EXPENSES.

A. The City Council shall establish by RESOLUTION a schedule of fees, charges and expenses, and a collection procedure for amendments, appeals, special use permits, plan approvals, and other matters pertaining to the administration and amendment of this Ordinance.

SECTION 12.0 PENALTIES

Failure to comply with the provisions of this Ordinance shall constitute a misdemeanor. Each day such violation exists may be considered a separate offense, subject to the penalty of a fine of $300.00, and not more than thirty (30) days incarceration in the County Jail, or both such fine and imprisonment. In addition to the criminal penalties above, the City of Clark Fork may proceed against the violator by initiating civil legal action in a court of competent jurisdiction. In the event the City prevails, the violator shall be responsible for all costs including a reasonable sum for attorney's fees. Nothing herein contained shall prevent the City Council or any other public official or private citizen from taking such legal action as may be

necessary to restrain or prevent any violation of this Ordinance or the Idaho Code.

SECTION 13.0 SEPARABILITY.

A. If any section, subsection, sentence, clause, phrase or portion of this Ordinance is for any reason held invalid, or unconstitutional by any court of competent jurisdiction, such portion shall be deemed a separate, distinct and independent provision and such holding shall not affect the validity of the remaining portions thereof.

SECTION 14.0 EFFECTIVE DATE AND PUBLICATION.

A. This Ordinance shall be in full force and effect following its approval, passage, and publication in one (1) issue of the Bonner County Daily Bee.

PASSED and APPROVED as an Ordinance of the City of Clark Fork, Idaho, this 16th day of August, 2000

Linda V. Reed

Linda V. Reed, Mayor

CITY COUNCIL MEMBERS	YES	NO	ABSENT	ABSTAIN
Lynn Siple	X			
Kathy Johnson	X			
Tom Shields			X	
Mary Milotz	X			

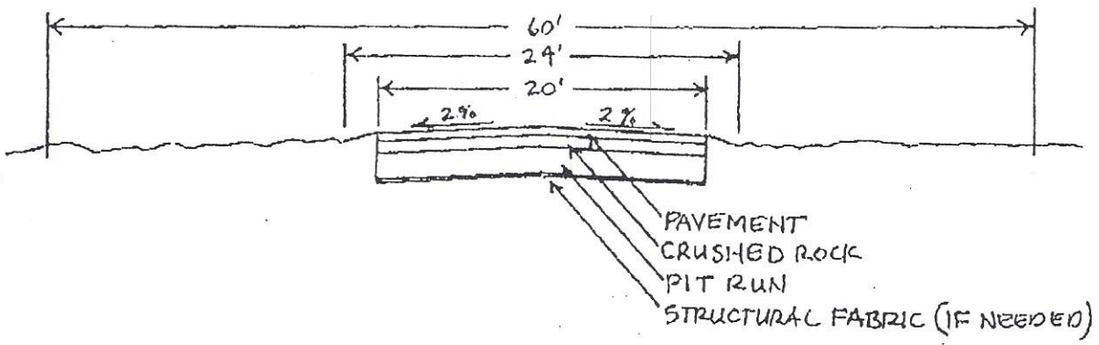
ATTEST: Elizabeth Parenti

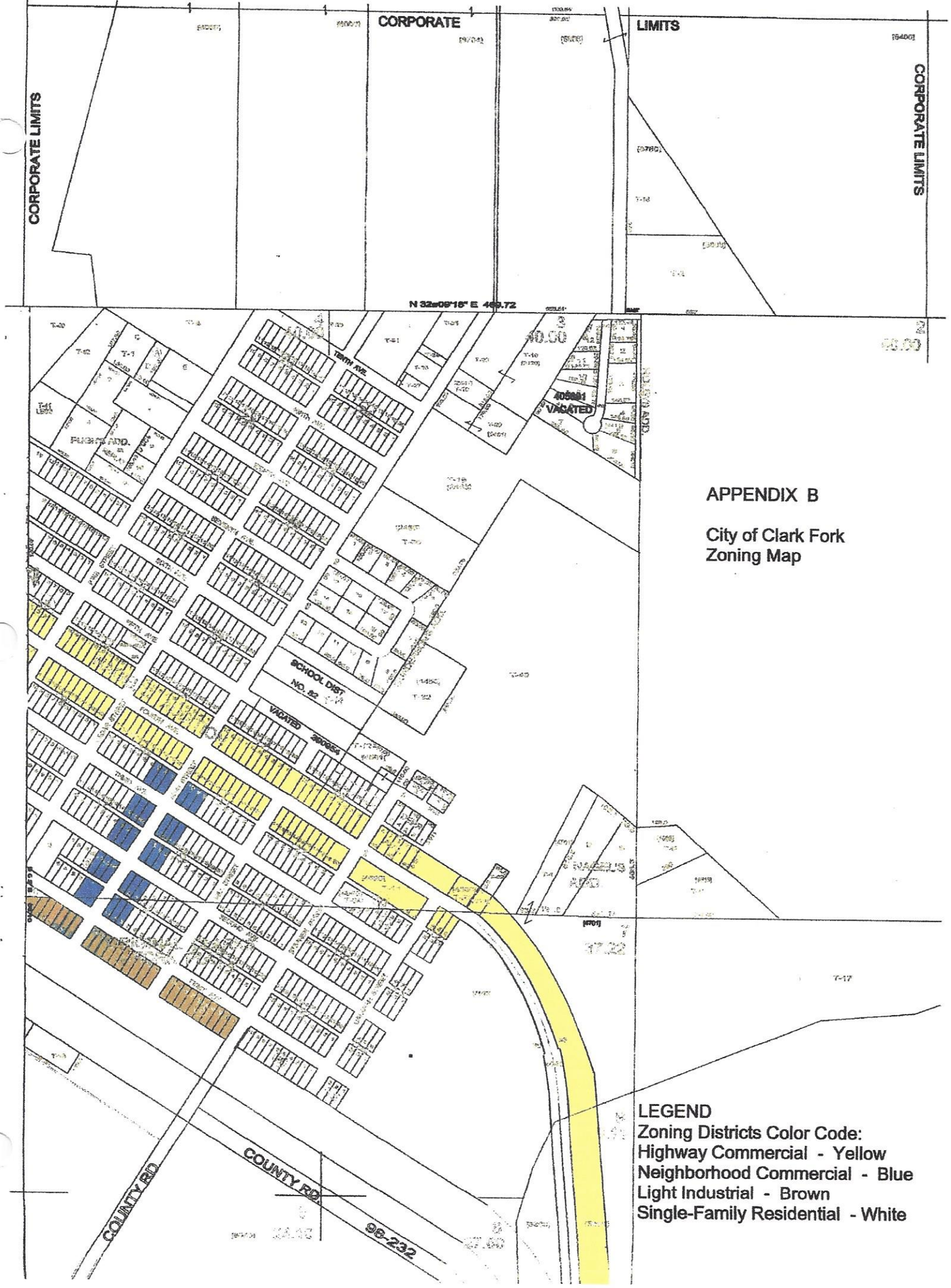
Elizabeth Parenti, City Clerk

EXHIBIT "A"

Residential Street
Right of Way = 60 ft.
Paved Travel way = 20 ft. (with a 2% crown)
Overall Width = 24 ft. (20 ft. travel way with 2 ft. shoulders)
Section: Place structural fabric over native sub grade (if sub grade is non-granular material), then 12" of 4 inch minus pit run, then 4" of 3/4 inch minus crushed rock, then 2.5" of asphalt cement paving.

An alternative to installing 2.5" of AC would be to install 6" of 3/4" minus crushed rock (instead of 4") and apply a double shot BST.

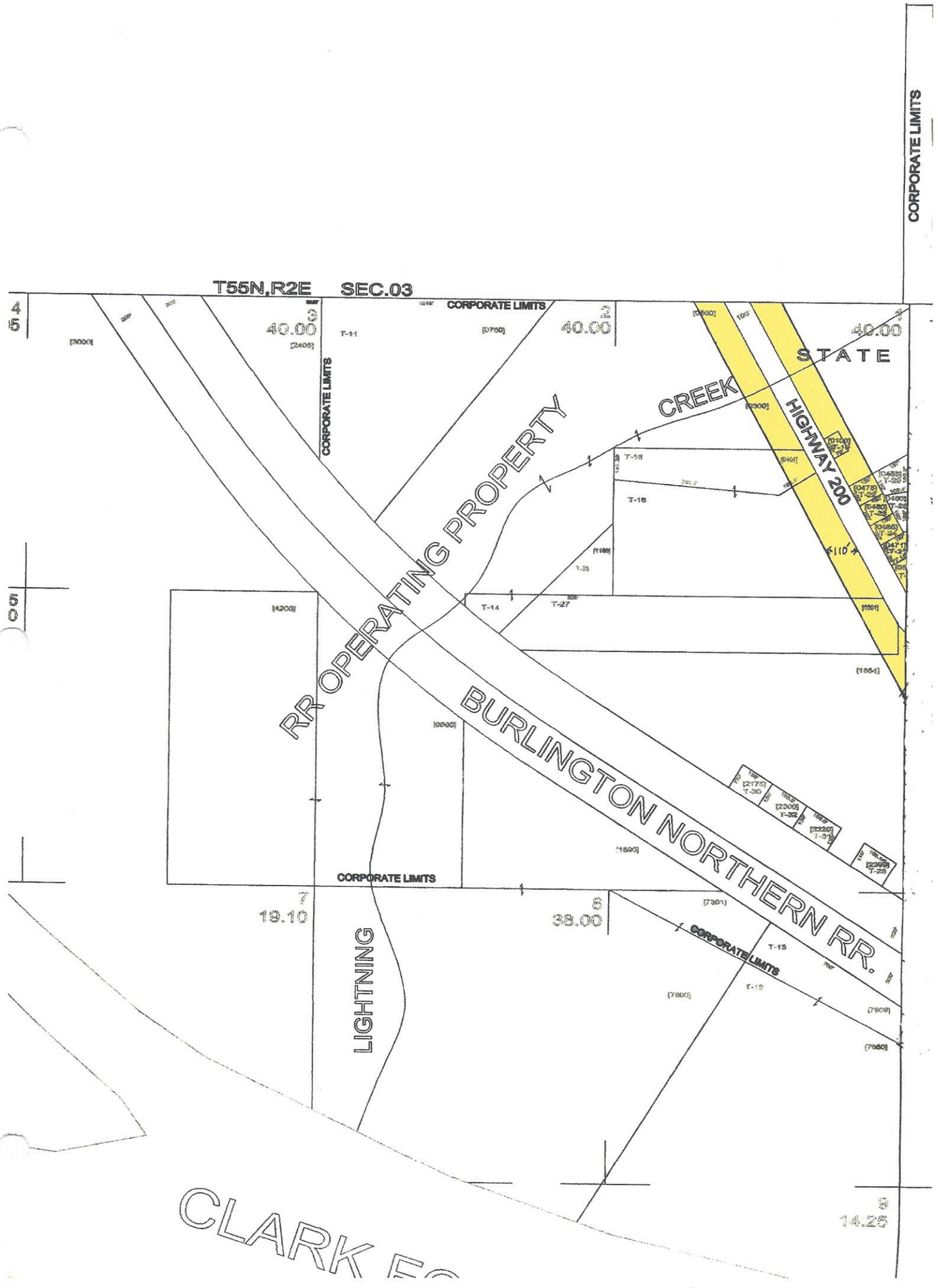


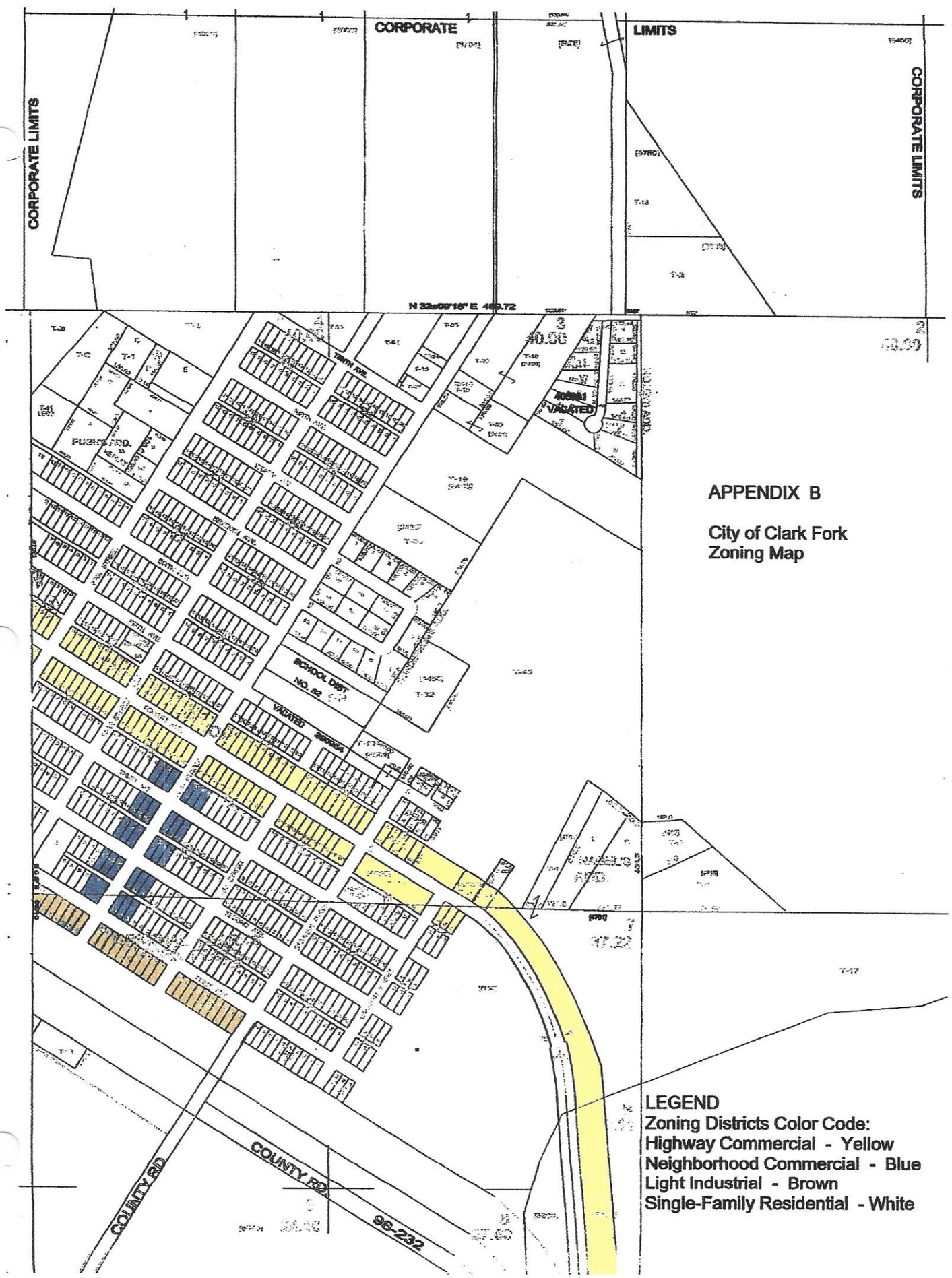


APPENDIX B

City of Clark Fork
Zoning Map

LEGEND
Zoning Districts Color Code:
Highway Commercial - Yellow
Neighborhood Commercial - Blue
Light Industrial - Brown
Single-Family Residential - White


T55N,R2E SEC.03
CORPORATE LIMITS
CORPORATE LIMITS
CORPORATE LIMITS
CORPORATE LIMITS
CORPORATE LIMITS
40.00
40.00
40.00
STATE
HIGHWAY 200
CREEK
RR OPERATING PROPERTY
BURLINGTON NORTHERN RR.
LIGHTNING
CLARK FO
19.10
38.00
14.25
54
55
110'



APPENDIX B

City of Clark Fork
Zoning Map

LEGEND
Zoning Districts Color Code:
Highway Commercial - Yellow
Neighborhood Commercial - Blue
Light Industrial - Brown
Single-Family Residential - White

SUMMARY OF CLARK FORK ZONING ORDINANCE
ORDINANCE NO. 222

The City of Clark Fork, Idaho hereby gives notice of the adoption of Clark Fork Ordinance No. 222, an ordinance establishing zoning for the City of Clark Fork. The ordinance contains the following provisions: a provision for a short title, statements of authority, interpretation and scope; a section defining terms used in the ordinance; a section providing for the establishment of districts and zoning map, including maps and boundaries, zoning across lot lines, and flood plain zoning; a section establishing use districts; a section preserving designated uses in accordance with the COMPREHENSIVE PLAN, including uses permitted and conditional uses for each use district; a section on non-conforming uses; a section detailing standards for street access; a section providing for establishment of fees, charges, expenses, collection procedures, appeals, special use permits, plan approvals and other matters for administration of zoning ordinance; a section providing penalties for violation, including fines, misdemeanor criminal penalties and civil remedies; a section providing for severability; and provides that the ordinance shall be effective following its passage on the 16th day of Aug., 2000 and publication which is accomplished by this summary. The full text of the Clark Fork Zoning Ordinance is available at City Hall in Clark Fork.

Dated this 16th day of Aug., 2000.

Elizabeth Parenti

Elizabeth Parenti, City Clerk

STATEMENT OF LEGAL ADVISOR

I, Terry J. Lopez, am the City Attorney for the City of Clark Fork, Idaho. I have examined the summary of the Clark Fork zoning Ordinance dated Aug. 16th, 2000 and find it to be a true and complete summary of said ordinance which provides adequate notice to the public of the contents thereof.

Terry J. Lopez

Terry J. Lopez, Attorney
Dated: June 16, 2000

AFFIDAVIT OF PUBLICATION

State of Idaho

ss.

County of Bonner, Sherilyn Jones

being first duly sworn on oath deposes and says that he/she is Bookkeeper of the Bonner County Daily Bee, a newspaper printed and published at Sandpoint, Bonner County, Idaho; that the said newspaper has been continuously and uninterruptedly published in said Bonner County during a period of 12 months prior to the first publication of the hereto attached notice of publication in the case of:

Ord. # 222

as it was published in the regular and entire issue of the said paper for a period of 1day ~~consecutive weeks~~, commencing on 23 day of Aug, 2000 and ending on the 23 day of Aug, 2000 and that said notice was published in said newspaper.

On this 23 day of Aug in the year of 2000, before me, a Notary Public, personally appeared Sherilyn Jones, known or identified to me to be the person whose name subscribed to the within instrument, and being by me first duly sworn, declared that the statements therein are true, and acknowledged to me that he executed the same.

CAROLYN L. INGE NOTARY PUBLIC STATE OF IDAHO

Carolyn L. Inge
Notary Public for Idaho

Residing at Sandpoint

My Commission expires: 8/06

SUMMARY OF CLARK FORK ZONING ORDINANCE ORDINANCE NO. 222

The City of Clark Fork, Idaho hereby gives notice of the adoption of Clark Fork Ordinance No. 222, an ordinance establishing zoning for the City of Clark Fork. The ordinance contains the following provisions: a provision for a short title, statements of authority, interpretation and scope; a section defining terms used in the ordinance; a section providing for the establishment of districts and zoning map, including maps and boundaries, zoning across lot lines, and flood plain zoning; a section establishing use districts; a section preserving designated uses in accordance with the COMPREHENSIVE PLAN, including uses permitted and conditional uses for each use district; a section on non-conforming uses; a section detailing standards for street access; a section providing for establishment of fees, charges, expenses, collection procedures, appeals, special use permits, plan approvals and other matters for administration of zoning ordinance; a section providing penalties for violation, including fines, misdemeanor criminal penalties and civil remedies; a section providing for severability; and provides that the ordinance shall be effective following its passage on the 16th day of Aug. 2000 and publication which is accomplished by this summary. The full text of the Clark Fork Zoning Ordinance is available at City Hall in Clark Fork.

Dated this 16th day of Aug. 2000.
/s/Elizabeth Parenti, City Clerk
Legal SNP#2001
August 23, 2000

2001

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Dated this 3rd day of July, 2000.

Elizabeth Parenti, City Clerk

STATEMENT OF LEGAL ADVISOR

I, Terry J. Lopez, am the City Attorney for the City of Clark Fork, Idaho. I have examined the summary of the Clark Fork zoning Ordinance dated June 16, 2000 and find it to be a true and complete summary of said ordinance which provides adequate notice to the public of the contents thereof.

/s/Terry J. Lopez, Attorney

Dated: June 16, 2000

Legal SNP#1884
July 7, 2000

Bonner County Daily Bee
Friday, July 7, 2000
Page 10

AFFIDAVIT OF PUBLICATION

State of Idaho

ss.

County of Bonner, Sherilyn Jones

being first duly sworn on oath deposes and says that he/she is Bookkeeper of the Bonner County Daily Bee, a newspaper printed and published at Sandpoint, Bonner County, Idaho; that the said newspaper has been continuously and uninterruptedly published in said Bonner County during a period of 12 months prior to the first publication of the hereto attached notice of publication in the case of:

Ord. # 222

as it was published in the regular and entire issue of the said paper for a period of 1 day ~~consecutive weeks~~, commencing on 23 day of Aug, 20 00 and ending on the 23 day of Aug, 20 00 and that said notice was published in said newspaper.

On this 23 day of Aug in the year of 2000, before me, a Notary Public, personally appeared Sherilyn Jones, known or identified to me to be the person whose name subscribed to the within instrument, and being by me first duly sworn, declared that the statements therein are true, and acknowledged to me that he executed the same.

CAROLYN L. INGE NOTARY PUBLIC STATE OF IDAHO

Carolyn L. Inge

Notary Public for Idaho

Residing at Sandpoint

My Commission expires: 8/06

SUMMARY OF CLARK FORK ZONING ORDINANCE ORDINANCE NO. 222

The City of Clark Fork, Idaho hereby gives notice of the adoption of Clark Fork Ordinance No. 222, an ordinance establishing zoning for the City of Clark Fork. The ordinance contains the following provisions: a provision for a short title, statements of authority, interpretation and scope; a section defining terms used in the ordinance; a section providing for the establishment of districts and zoning map, including maps and boundaries, zoning across lot lines, and flood plain zoning; a section establishing use districts; a section preserving designated uses in accordance with the COMPREHENSIVE PLAN, including uses permitted and conditional uses for each use district; a section on non-conforming uses; a section detailing standards for street access; a section providing for establishment of fees, charges, expenses, collection procedures, appeals, special use permits, plan approvals and other matters for administration of zoning ordinance; a section providing penalties for violation, including fines, misdemeanor criminal penalties and civil remedies; a section providing for severability; and provides that the ordinance shall be effective following its passage on the 16th day of Aug. 2000 and publication which is accomplished by this summary. The full text of the Clark Fork Zoning Ordinance is available at City Hall in Clark Fork.

Dated this 16th day of Aug. 2000.
/s/Elizabeth Parenti, City Clerk
Legal SNP#2001
August 23, 2000

AFFIDAVIT OF PUBLICATION

State of Idaho

ss.

County of Bonner, Sherilyn Jones

being first duly sworn on oath deposes and says that he/she is Bookkeeper of the Bonner County Daily Bee, a newspaper printed and published at Sandpoint, Bonner County, Idaho; that the said newspaper has been continuously and uninterruptedly published in said Bonner County during a period of 12 months prior to the first publication of the hereto attached notice of publication in the case of:

Ord. # 222

as it was published in the regular and entire issue of the said paper for a period of 1day ~~consecutive weeks~~, commencing on 23 day of Aug, 2000 and ending on the 23 day of Aug, 2000 and that said notice was published in said newspaper.

On this 23 day of Aug in the year of 2000, before me, a Notary Public, personally appeared Sherilyn Jones, known or identified to me to be the person whose name subscribed to the within instrument, and being by me first duly sworn, declared that the statements therein are true, and acknowledged to me that he executed the same.

CAROLYN L. INGE NOTARY PUBLIC STATE OF IDAHO

Carolyn L. Inge

Notary Public for Idaho

Residing at Sandpoint

My Commission expires: 8/06

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The City of Clark Fork, Idaho hereby gives notice of the adoption of Clark Fork Ordinance No. 222, an ordinance establishing zoning for the City of Clark Fork. The ordinance contains the following provisions: a provision for a short title, statements of authority, interpretation and scope; a section defining terms used in the ordinance; a section providing for the establishment of districts and zoning map, including maps and boundaries, zoning across lot lines, and flood plain zoning; a section establishing use districts; a section preserving designated uses in accordance with the COMPREHENSIVE PLAN, including uses permitted and conditional uses for each use district; a section on non-conforming uses; a section detailing standards for street access; a section providing for establishment of fees, charges, expenses, collection procedures, appeals, special use permits, plan approvals and other matters for administration of zoning ordinance; a section providing penalties for violation, including fines, misdemeanor criminal penalties and civil remedies; a section providing for severability; and provides that the ordinance shall be effective following its passage on the 16th day of Aug. 2000 and publication which is accomplished by this summary. The full text of the Clark Fork Zoning Ordinance is available at City Hall in Clark Fork.

Dated this 16th day of Aug. 2000.
/s/Elizabeth Parenti, City Clerk
Legal SNP#2001
August 23, 2000

2001

AFFIDAVIT OF PUBLICATION

State of Idaho

ss.

County of Bonner,

Sherilyn Plunk being first duly sworn on oath deposes and says that he/she is Bookkeeper of the Bonner County Daily Bee, a newspaper printed and published at Sandpoint, Bonner County, Idaho; that the said newspaper has been continuously and uninterruptedly published in said Bonner County during a period of 12 months prior to the first publication of the hereto attached notice of publication in the case of:

Ord. # 222

as it was published in the regular and entire issue of the said paper for a period of 1 day ~~consecutive weeks~~, commencing on 7 day of July, 19 00 and ending on the 7 day of July, 19 00 and that said notice was published in said newspaper.

On this 7 day of July in the year of 2000, before me, a Notary Public, personally appeared Sherilyn Plunk, known or identified to me to be the person whose name subscribed to the within instrument, and being by me first duly sworn, declared that the statements therein are true, and acknowledged to me that he executed the same.

Carolyn L. Ingo
Notary Public for Idaho

Residing at Sandpoint

My commission expires: 7/00

SUMMARY OF CLARK FORK ZONING ORDINANCE ORDINANCE NO. 222

The City of Clark Fork, Idaho hereby gives notice of the adoption of Clark Fork Ordinance No.222 an ordinance establishing zoning for the City of Clark Fork. The ordinance contains the following provisions: a provision for a short title, statements of authority, interpretation and scope; a section defining terms used in the ordinance; a section providing for the establishment of districts and zoning map, including maps and boundaries, zoning across lot lines, and flood plain zoning; a section establishing use districts; a section preserving designated uses in accordance with the COMPREHENSIVE PLAN, including uses permitted and conditional uses for each use district; a section on non-conforming uses; a section detailing standards for street access; a section providing for establishment of fees, charges, expenses, collection procedures, appeals, special use permits, plan approvals and other matters for administration of zoning ordinance; a section providing penalties for violation, including fines, misdemeanor criminal penalties and civil remedies; a section providing for severability; and provides that the ordinance shall be effective following its passage on the 14th day of August, 2000 and publication which is accomplished by this summary. The full text of the Clark Fork Zoning Ordinance is available at City Hall in Clark Fork.

Dated this 3rd day of July, 2000.
Elizabeth Parenti, City Clerk

STATEMENT OF LEGAL ADVISOR

I, Terry J. Lopez, am the City Attorney for the City of Clark Fork, Idaho. I have examined the summary of the Clark Fork zoning Ordinance dated June 16, 2000 and find it to be a true and complete summary of said ordinance which provides adequate notice to the public of the contents thereof.

/s/Terry J. Lopez, Attorney
Dated: June 16, 2000

Legal SNP#1884
July 7, 2000

1884

Appendix A-2

City of Clark Fork's Cross Connection Control Ordinance

ORDINANCE NO. 232

AN ORDINANCE OF THE CITY OF CLARK FORK, IDAHO PROVIDING FOR THE ESTABLISHMENT OF A WATER SYSTEM CROSS CONNECTION POLICY FOR THE CITY OF CLARK FORK; PROVIDING FOR A TITLE; PROVIDING FOR THE PURPOSE AND SCOPE; PROVIDING FOR DEFINITIONS; PROVIDING FOR PREVENTION OF UNLAWFUL CONTAMINATION OR CROSS CONNECTIONS; PROVIDING FOR PROTECTION OF WATER SUPPLY; PROVIDING FOR USE OF BACKFLOW PREVENTION DEVICES; PROVIDING FOR CROSS CONNECTION INSPECTIONS; PROVIDING FOR THE TYPE OF PROTECTIVE DEVICES REQUIRED; PROVIDING FOR VIOLATIONS AND PENALTIES, INCLUDING MISDEMEANOR CRIMINAL PENALTIES AND PERMITTING MANDATORY DISCONNECTION; PROVIDING FOR SEVERABILITY; AND PROVIDING THAT THE ORDINANCE WILL BE EFFECTIVE UPON PUBLICATION.

BE IT ORDAINED, BY THE MAYOR AND CITY COUNCIL OF THE CITY OF CLARK FORK, BONNER COUNTY, IDAHO.

SECTION 1. TITLE

This ordinance shall be known as the City of Clark Fork Cross Connection Ordinance

SECTION 2. PURPOSE AND SCOPE:

The purpose of this ordinance is to protect the public health of water consumers by the control of actual and/or potential cross connections.

SECTION 3. APPLICABILITY

This ordinance applies throughout the City of Clark Fork and by agreement outside the City of Clark Fork to every premises and the owners and occupants thereof served by the water system of the City of Clark Fork. It applies to all systems installed prior to or after its enactment. Every owner and occupant of any premises covered by this ordinance is responsible for compliance with its terms and shall be strictly liable for all damage incurred as a result of failure to comply with the express terms and provisions contained herein.

SECTION 4. DEFINITIONS:

As used in this ordinance, unless the context otherwise requires, the following words and terms shall have the meanings ascribed to them in this Section:

4.1. BACKFLOW: The flow, other than the intended direction of flow, of any foreign liquids, gases or substances into the distribution system of a public water supply as a result of reduced or reversed pressure.

4.2. BACKFLOW PREVENTION DEVICE: A device which, when properly installed between the City water supply system and the terminus or point of ultimate use, will prevent backflow.

4.3. CONTAMINATION: The entry into or presence in a public water supply of any substance, which may be deleterious to health and/or quality of the water.

4.4. CROSS CONNECTION: Any physical arrangement whereby a public water supply is connected, directly or indirectly, with any other water supply system, sewer, drain, conduit, pool, storage reservoir, plumbing fixture or other device which contains or may contain contaminated water, sewage or other waste or liquids of unknown or unsafe quality which may be capable of imparting contamination to the public water supply as a result of backflow.

4.5. PUBLIC WATER SUPPLY: Any system of water supply intended or used for human consumption or other domestic uses, including source, treatment, storage, transmission and distribution facilities, where water is furnished to any collection or number of individuals or is made available to the public for human consumption or domestic use.

4.6. AIR GAP (AG): Air gap separation means the unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet supplying water to tank, plumbing fixture, or other device and the flood level rim of the receptacle, and must be at least double the diameter of the supply pipe measured vertically above the flood level rim of the vessel. In no case may the gap be less than one inch.

4.7. REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY (RPBA): An assembly incorporating two or more check valves and an automatically operating differential relief valve located between the two checks, two resilient seated shutoff valves, one located at each end of the assembly and equipped with properly located resilient seated test cocks for testing. The assembly must operate to maintain the pressure in the zone between the two check valves, less than the pressure on the public water system side of the assembly. At cessation of normal flow, the pressure between the check valve must be less than the supply pressure. In case of leakage of either check valve the differential relief valve must operate to maintain the reduced pressure by discharging to the atmosphere. When the inlet pressure drops below two pounds per square inch, the relief valve must open to the atmosphere thereby providing an atmospheric zone between the two check valves.

4.8. DOUBLE CHECK VALVE ASSEMBLY (DCVA): An assembly composed of two single, independently acting check valves, including resilient seated tightly closing shutoff valves located at each end of the assembly and equipped with properly located resilient seated test cocks for testing the watertightness of each check valve.

SECTION 5. UNLAWFUL CONTAMINATION OR CROSS CONNECTIONS:

It is unlawful for the owner, tenant, occupant, lessee or other user of City water to introduce or permit the introduction of pollution or contamination of any kind into the City water supply system. It is unlawful for any person to install or maintain any cross connection within the City of Clark Fork.

SECTION 6. PROTECTION OF WATER SUPPLY:

No water service connection to any premises shall be installed or continued in use within the City of Clark Fork unless the water supply is protected by backflow prevention devices whenever required by this ordinance or by rules or standards adopted by the State of Idaho. 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 and shall be penalized as a violation of this ordinance as hereinafter provided. The control or elimination of the cross connections shall be in accordance with this ordinance and the latest edition of appropriate manuals of standard practice pertaining to the cross connection control approved by the State. (or regulations set down in IDAPA 16.01.08601,04.a, together with the latest edition of appropriate manuals of standard practice pertaining to cross connection control.)

SECTION 7. USE OF BACKFLOW PREVENTION DEVICES:

Backflow prevention devices shall be installed by the property owner, tenant, occupant, lessee or other user of City water where the nature and extent of the activities conducted or materials used or stored on the premises would present an immediate and dangerous hazard to health and/or be potentially deleterious to the quality of the City water supply. Should a cross connection occur, even though such cross connection does not exist at present, a backflow prevention device shall be installed under circumstances including, but not limited to, the following:

7.1. Premises having an auxiliary water supply, unless the quality of the auxiliary supply is acceptable to the City of Clark Fork.

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

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

7.4. Premises having a repeated history of cross connections being established or re-established.

7.5. 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.

7.6. Premises having pumps or pumping devices which may affect the pressure within any line connected to the City water supply.

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

7.8. Other premises, as determined by the City of Clark Fork or by the rules established by the State of Idaho, where backflow prevention devices are required to protect the public water supply.

SECTION 8. CROSS CONNECTION INSPECTIONS:

Upon passage of this ordinance, any existing buildings, structures or improvements of any nature now receiving water through the City's system may be inspected by the City of Clark Fork for the purpose of ascertaining whether cross connections exist.

8.1. If backflow prevention devices are found to be necessary, the property owner shall have the required device installed and inspected within a period of three (3) months following the date of notification from the City of Clark Fork. Upon installation of such a device, property owners will be required to hire a licensed, American Waterworks Association (AWWA) certified tester to inspect the backflow prevention device. Within 30 days of the date of the inspection, the AWWA licensed tester, or property owner, must submit, in writing, the results of this test to the City of Clark Fork.

8.2. Subsequently, all existing buildings, structures or improvements of any nature, after having a backflow prevention device installed, and still receiving water through the City's system, will be required to have annual inspections by an AWWA licensed tester, and provide results of the inspection within 30 days of the inspection date to the City of Clark Fork.

8.3. Whenever the backflow prevention devices are found to be defective, they shall be repaired, overhauled or replaced at the customer's expense within no more than 30 days of the date of inspection.

8.4. 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 of Clark Fork for possible cross connections and have been approved as being free of the same.

8.5 Any structure hereafter built within the City or within areas served by City water requiring backflow prevention devices shall adhere to the same rules as set forth in subsections 8.1, 8.2 and 8.3.

SECTION 9. TYPE OF PROTECTIVE DEVICES REQUIRIED.

The type of protective device required shall depend on the degree of hazard that exists.

9.1. Backflow prevention devices required by this ordinance shall be in accordance with the types of devices specified in the latest edition of appropriate manuals of standard practice pertaining to the cross connection control approved by the State.

9.2. An air-gap separation or a 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.

9.3. 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.

9.4. Backflow prevention devices required by this ordinance 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 City of Clark Fork. 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.

9.5. 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. Such sprinkler lines shall be connected only to metered private water service lines.

SECTION 10. VIOLATIONS AND PENALTIES:

If a customer fails to cooperate in the installation, maintenance, testing, repair or inspection of backflow prevention devices required by this ordinance, then delivery of water to the property may be discontinued until the deficiency is corrected to the City of Clark Fork's satisfaction. Delivery of water to the property may also be discontinued in the event an improper cross connection is not corrected by a customer within the time limits set by this ordinance. If contamination of the City's water system occurs as a consequence of a system user failing to comply with provisions of this ordinance, the user shall be responsible for all costs of decontamination and remediation of the damage caused thereby. Any violation of this ordinance, or standards incorporated by this ordinance, shall be subject to misdemeanor criminal penalties including a fine of up to $300 per day and incarceration for up to six (6) months for each violation. Each day of noncompliance may be considered a separate violation. Any violation of this ordinance may also be sanctioned by mandatory disconnection from the city water system.

SECTION 11. SEVERABILITY:

The provisions of this ordinance are hereby declared to be severable and if any provision to a person or circumstance is declared invalid for any reason, such declaration shall not affect the validity of remaining portions of this ordinance.

SECTION 12. EFFECTIVE DATE:

This ordinance shall be effective upon its passage and publication as provided by law.

PASSED under suspension of the rules upon which a roll call vote was duly taken, and enacted by the City Council as an ordinance of the City of Clark Fork on the 9th day of Dec., 2002.

APPROVED by the Mayor, this 9th day of December, 2002.

CITY OF CLARK FORK

Thomas A. Shields

Thomas A. Shields, Mayor

ATTEST: Elizabeth A. Parenti

Elizabeth Parenti
City Clerk

SUMMARY OF ORDINANCE NO. 232

The City of Clark Fork, Bonner County, Idaho, hereby gives notice of the adoption of Clark Fork Ordinance No. 232, an ordinance of the City of Clark Fork, Idaho, a municipal corporation of the State of Idaho, establishing a water system cross connection policy; providing a title; providing purpose, scope, applicability and definitions; providing for prevention of unlawful contamination or cross connections; providing for protection of the water supply; providing for use of backflow prevention devices; providing for cross connection inspections; providing for type of protective devices required; providing for violations and penalties, including misdemeanor criminal penalties and permitting mandatory disconnection; providing for severability; and providing that the ordinance will be effective upon publication of this summary. The full text of the summarized Ordinance No. 232 is available at Clark Fork City Hall, 110 E. 3rd Avenue, Clark Fork, Idaho 83811 in the office of the City Clerk between 8:00 AM and 12:00 Noon weekdays.

Elizabeth Parenti, City Clerk

Publish once in the City's official newspaper (Daily Bee)

STATEMENT OF LEGAL ADVISER

I, Jerry D. Mason, am the City Attorney for the city of Clark Fork, Idaho. I have examined the attached summary of Clark Fork Ordinance No. 232 and find it to be a true and complete summary of said ordinance which provides adequate notice to the public of the contents thereof.

Jerry D. Mason, City Attorney

Date 12/10/02

AFFIDAVIT OF PUBLICATION

State of Idaho

ss.

County of Bonner, Sherilyn Jones

being first duly sworn on oath deposes and says that he/she is BookKeeper of the Bonner County Daily Bee, a newspaper printed and published at Sandpoint, Bonner County, Idaho; that the said newspaper has been continuously and uninterruptedly published in said Bonner County during a period of 12 months prior to the first publication of the hereto attached notice of publication in the case of:

Ord #232

as it was published in the regular and entire issue of the said paper for a period of 1day ~~consecutive weeks~~, commencing on 13 day of Dec., 2002 and ending on the 13 day of Dec., 2002 and that said notice was published in said newspaper.

On this 13 day of Dec. in the year of 2002, before me, a Notary Public, personally appeared Sheri Jones, known or identified to me to be the person whose name subscribed to the within instrument, and being by me first duly sworn, declared that the statements therein are true, and acknowledged to me that he executed the same.

CAROLYN L. INGE NOTARY PUBLIC STATE OF IDAHO

Carolyn L. Inge
Notary Public for Idaho

Residing at Sandpoint

My Commission expires: 8/06

SUMMARY OF ORDINANCE
NO. 232

The City of Clark Fork, Bonner County, Idaho, hereby gives notice of the adoption of Clark Fork Ordinance No. 232, an ordinance of the City of Clark Fork, Idaho, a municipal corporation of the State of Idaho, establishing a water system cross connection policy; providing a title; providing purpose, scope, applicability and definitions; providing for prevention of unlawful contamination or cross connection; providing for protection of water supply; providing for a use of backflow prevention devices; providing for cross connection inspections; providing for type of protective devices required; providing for violations and penalties, including misdemeanor criminal penalties and permitting mandatory disconnection; providing severability; and providing that the ordinance will be effective upon publication of this summary. The full text of the summarized Ordinance No. 232 is available at Clark Fork City Hall, 110 E. 3rd Avenue, Clark Fork, Idaho 83811 in the office of the City Clerk between 8:00 AM and 12:00 Noon weekdays.

Elizabeth Parenti, City Clerk
Legal 3953
Dec. 13, 2002

3953

Appendix A-3

City of Clark Fork's Water Ordinance

WATER ORDINANCE NO. 251

INDEX TO ORDINANCE (use CTRL key and click underlined link)

1. Section 1 Purposes
2. Section 2 Definitions
3. Section 3 To Whom This Ordinance is Applicable
4. Section 4 Required Use Of Systems
5. Section 5 Injury To System Unlawful
6. Section 6 Malicious Or Willful Waste Of Water
7. Section 7 Water Service Connection And Water Service Line
8. Section 8 Water Main Extensions
9. Section 9 Unavailability Of Municipal Systems
10. Section 10 Fire Hydrants
11. Section 11 Powers And Authority Of City Authorized Representative
12. Section 12 Inspection
13. Section 13 Rejections And Disapprovals
14. Section 14 Basis For Base Rate Charges
15. Section 15 User Rates, Charges And Connection Fees
16. Section 16 Modification Of User Rates And/or Connection Fees
17. Section 17 User Charges; When due And Payable
18. Section 18 Discontinuance Of Water Service For Default
19. Section 19 Connection/Disconnection Of Services
20. Section 20 Property Owner Responsibility
21. Section 21 Delinquency; Notice
22. Section 22 Water System Fund
23. Section 23 Penalties
24. Section 24 Emergency Clause
25. Section 25 Repealer Clause
26. Section 26 Severability Clause
27. Section 27 Publication And Effective Date

WATER ORDINANCE NO. 251

AN ORDINANCE OF THE CITY OF CLARK FORK, REPEALING WATER ORDINANCE NUMBERS 214, 240 & 249, REPEALING SECTIONS OF ORDINANCE NUMBERS 221, 223, 225 & PROVIDING REGULATIONS AND GUIDELINES FOR ADMINISTRATION OF THE WATER SYSTEM OF THE CITY OF CLARK FORK, ADOPTING IDAHO RULES FOR PUBLIC DRINKING WATER SYSTEMS, ADOPTING IDAHO STANDARDS FOR PUBLIC WORKS CONSTRUCTION, PROVIDING FOR CONNECTION POLICIES, PROHIBITING CROSS CONNECTION, PROVIDING FOR SYSTEM EXTENSION POLICIES, INSPECTIONS, SPECIAL CHARGES, PENALTIES, SEVERABILITY, PUBLICATION AND PROVIDING FOR AN EFFECTIVE DATE.

BE IT ORDAINED BY THE MAYOR AND THE CITY COUNCIL OF THE CITY OF CLARK FORK, IDAHO:

Section 1 PURPOSES.

It is hereby determined and declared to be necessary for protection of the health, safety and welfare of the public which consumes water from the City of Clark Fork Water System that standards be established for use and connection to said system. Additional purposes for this ordinance include equitably apportioning the costs and expenses of maintenance, operation, upkeep and repair of water system components which include supply, storage, treatment and distribution facilities, collecting appropriate charges from owners of benefited lots, lands, property and premises, and when necessary, governing the installation, use and administration of private domestic water systems where a public water system is not available.

Section 2 DEFINITIONS.

Unless the context specifically indicates otherwise, the meaning of terms used in this Ordinance shall be as follows:

Authorized Representative- Mayor or City Council or its authorized Planner or Engineer.

City- The City of Clark Fork, Bonner County, Idaho, or its authorized or designated officials, agents, or representatives.

City Water Service Line- That portion of an individual water service line that runs from its connection with the public water main to and including the corporation stop and meter box that is installed in the service line, ending at the meter outlet. It will usually be installed within the limits of the public right-of-way or utility easement, and, after installation, it is owned and maintained by the City.

Cross-Connection- Means any physical arrangement whereby the municipal water system is connected, directly or indirectly, with any non-potable water system, private well, sewer, drain, conduit, pool, storage reservoir, plumbing fixture, or other device which contains, or may contain, contaminated water, sewage, or other waste liquid of unknown or unsafe quality which may be capable of imparting contamination to the municipal water system as a result of back-flow. Bypass arrangements, jumper connections, removable sections, swivel or change-over devices, or other temporary or permanent devices through which, or because of which, back-flow may occur are considered to be cross-connections.

IFC- International Fire Code, which contains provisions to regulate fire hazards in existing buildings, as well as provisions for the installation, testing and maintenance of fire protection features in both new and existing buildings.

ISPWC- Idaho Standards For Public Works Construction, reference document for construction and quality control of public works infrastructure projects.

Multiple Building Development- Includes the various types of developments that would have common or joint ownership areas such as condominiums, townhouses, mobile home parks or courts, shopping centers, etc.

Municipal Water System- Includes all components and facilities of the public water system that is owned, operated and maintained by the City of Clark Fork, Idaho, for domestic and other uses.

Owner- Refers to the property owners, or his duly authorized representative such as developer, etc., who holds legal title to a property that is served or is to be served by the Municipal Water System.

Person- Any individual, firm, company, association, society, corporation or group.

Private Fire Service Connection- This is a separate and independent connection from the municipal water main that connects directly to a fire suppression sprinkler system that has been, or is to be installed, in any building for the purpose of fire control within that specific building and said connection is to be for no other purpose.

Private Water Service Line- This is to be the portion of the water service line that runs from the limits of the building being served to the point of connection with the City Water Service Meter.

Private Water System- This is any water system for domestic use that is not owned, operated and maintained by the City of Clark Fork, within City boundaries.

Property- Refers to all real property, whether privately or publicly owned, within the service limits of the Municipal Water System excluding therefrom lands that have been dedicated for public street or highway rights-of-way.

Public Water Service Line- See City Water Service Line.

Shall- "Shall" is mandatory; "May" is permissive.

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.

User- Each residence, mobile home or business supplied with water from a meter is considered a separate user; there may be more than one user on a meter.

Water Main- Any pipe line owned by the City for the purpose of transportation and/or distribution of water.

Section 3 TO WHOM THIS ORDINANCE IS APPLICABLE.
The provisions of this Ordinance shall apply to owners of all property within the corporate limits of

the City, any special users outside of the Corporate Limits of the City, including all property owned or occupied by the United States of America, Bonner County, and the State of Idaho.

Section 4 REQUIRED USE OF SYSTEMS.

The owner or occupant of any house, building, or property used for residential, commercial, industrial, governmental or recreational use, or 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 water line of the City is hereby required to connect his domestic water service line to the City water service line in accordance with the provisions of this Ordinance within one hundred eighty (180) days after the date of official notice from the City that water service is available. If said water line is within three hundred (300) feet of any property line of the building to be served or of a common property line in a multiple building development, it shall be deemed to be abutting. Each property owner desiring to receive service from the Municipal Water System shall be obligated to extend the water main which serves his/her property across the entire frontage of his/her property as a condition of receiving service. The purpose of this requirement is to make service available to subsequent users of adjoining property. This provision shall not obligate current system users to extend the water system to serve future users or nearby new development.

Section 5 INJURY TO SYSTEM UNLAWFUL.

No person shall maliciously, willfully or negligently break, damage, destroy, cover, uncover, deface or tamper with any structure, pipeline, fire hydrant, fittings, connection, appurtenance, or equipment which is a part of the Municipal Water System. Nor shall any person cause the elevation or degradation of the grounds around or near any portion of the Municipal Water System in a manner that would require the City to modify, repair or reconfigure the System. Any person who causes harm or damage to the Municipal Water System as outlined in this paragraph shall be responsible to reimburse the City for all costs required to repair, modify or reconfigure the Water System. Failure to pay the costs of repair, modify or reconfiguration the Water System shall be grounds for termination of service.

Section 6 MALICIOUS OR WILLFUL WASTE OF WATER.

It shall be unlawful for any water user to waste water or allow it to be wasted by imperfect water stops, valves, leaky joints or pipes that are not under the jurisdiction of the City or to permit the malicious or wasteful consumption of water, having no beneficial purpose, from the municipal water system. Likewise, it shall be unlawful to allow a constant flow of water for animal consumption but rather a quantity of water shall be allowed which will supply the actual needs of the animals having access thereto. Service may be immediately terminated to an account without notice if the leak is so substantial as to constitute an emergency.

Section 7 WATER SERVICE CONNECTION AND WATER SERVICE LINE.

All materials and workmanship in the connection to the City water service line shall conform to the following regulations and/or standards:

A. No unauthorized person shall uncover, make any connections with or opening into, use, alter, or disturb any municipal water main, City water service line or appurtenance thereof without first obtaining written approval from the City.
B. To obtain municipal water services, the owner or his agents shall make written application to the City on a form provided by the City.
C. A deposit, as set forth by resolution, shall be paid at time of application. All costs and expenses incident to the installation of the water service line and the connection to the City water main shall be paid prior to installation.
D. The meter and installation hardware shall remain the property of the City which shall be responsible for maintenance of such public facilities, unless repairs are made necessary by the reckless, negligent or otherwise wrongful conduct of a private party.
E. All water service connections, materials of construction including methods to be used in excavating, placing of the pipe, joining, testing and backfilling and the service line

State Plumbing Code

from the building to the connection with the City water main line shall conform to the requirements of the current state adopted plumbing code.

F. A separate and independent City water service line and connection may be provided for every building requiring water.

G. The alignment of the water service line from the outlet of the building to the City water main shall be located such that the distance between the water service line and the septic tank, drain field and/or sewer service line shall not be less than required by Panhandle Health District and Idaho Department of Health and Welfare standards.

Panhandle Health District

H. No person shall make or permit the cross-connection of any private water supply or other source prohibited by state law to a water line that is served by the municipal water system. The City of Clark Fork hereby adopts the "Idaho Rules For Public Drinking Water Systems" IDAPA 58.01.08.543 http://adm.idaho.gov/adminrules/rules/idapa58/0108.pdf regarding cross connections. Three (3) copies will be kept on file at City Hall.

Cross Connections

I. An applicant for the City water service shall notify the City when connection of the private water service line to the City water service line is ready for inspection of connection only.

J. The installation of a private fire service connection shall comply in all respects to the requirements for a City water service line. The owner or his agent shall be required to pay, as set forth by resolution, all costs for connection and extension of the facility from the municipal water main which may be installed without a meter. A commercial anti-backflow device must be installed. Any such service shall be subject to inspection by the City at any time to assure that the fire service connection is not being used for any other purpose.

Private Fire Service Connection

K. The connection of a private fire service connection to the municipal water main shall be made by a plumber holding a valid Plumber's License according to State Plumbing Code.

L. At no time shall a property owner or their agent, permit or allow permitting, a water line connection to cross property lines for any reason. A water connection shall service only one (1) property or lot(s). Any such connection confirmed, shall have the water shut off immediately until the non-permitted connection is terminated. Disconnect and Reconnect charges shall apply

Section 8 WATER MAIN EXTENSIONS.

A. The Idaho Standards For Public Works Construction, latest edition published by the Idaho Standards for Public Works Construction Committee, are hereby adopted.
B. All water line extensions shall be made in accordance with all City, State and Federal standards including fire hydrants.
C. All water main extensions shall be constructed by the City or its authorized contractor. The City shall require prepayment of all costs to water main extensions.
D. No work shall commence on any such extension of the municipal water system until the extension project has been approved by the authorized representative of the City in writing and a permit has been issued.
E. The cost of extending the municipal water system to serve undeveloped areas within the existing corporate limits, newly annexed areas or areas outside the corporate limits shall be the responsibility of the property owner(s) or agent. Unless a special permit is granted by the City, all municipal water system extensions, including the City water service lines into newly developed areas, shall be installed prior to the construction of any new streets.
F. All design and construction of any extensions to the municipal water system shall comply with the Idaho Standards for Public Works Construction (ISPWC) as published by the Association of Idaho Cities.
G. The plans for all extensions to the municipal water system shall be prepared and signed by a registered professional engineer

as per the licensing requirements of the Idaho Code, and three (3) copies of said plans shall be filed with the City. Two (2) copies of the plans shall be filed with the Idaho Department of Health and Welfare for their review and approval, per Idaho Code. In approving a plan for the extension to the municipal water system, the City reserves the right to stipulate other requirements such as; special permit fees as may be established by resolution, rights-of-way limits, sequence of construction, time limits for having existing service disrupted, the filing of a performance bond and other similar measures as may be required to protect the public.

H. After the construction of the municipal water system extensions, a registered professional engineer shall certify to the City and the Idaho Department of Health and Welfare in writing that said system extensions were installed according to the approved plans and specifications on file in the office of the City Clerk. The Project Engineer shall file two (2) sets of "Record Drawings" with the office of the City Clerk. Cost of said certification shall be at no expense to the City. Following certification by the registered professional engineer and acceptance by the City, the entire extension of the municipal water system, including the City water service lines, shall become the property of the City. The installer shall warrant such installation for one year and shall perform capital maintenance during that period. After conclusion of the one-year warranty period, it shall be the City's responsibility to maintain and operate the system thereafter.

I. All new and replacement water supply systems shall be designed and constructed to minimize or eliminate infiltration of flood waters into the system and minimize flood damage.

J. Fire hydrants shall be constructed at maximum every 500 feet, or as required by

the (IFC) or (ISPWC), whichever is more restrictive.

K. All plans shall comply with the City of Clark Fork's Ordinance for construction in flood prone areas.

L. The City may require that water lines be sized to provide services beyond the needs of the property being developed. In such case, the city shall pay the incremental costs related to increasing the size of the line.

M. No water line shall be covered until the City Engineer, at the cost of the developer, has inspected them. The developer or contractor shall provide at least 24 normal business hours notice to the City of a need for inspection.

Section 9 UNAVAILABILITY OF MUNICIPAL SYSTEMS.

Where the municipal water system is not available under the provisions of this Ordinance, a private water system may be installed, provided that the system complies with all the provisions of this Ordinance. Authority to develop a private water source or system within the City must be expressly granted by the City Council if a private water source is to be used.

A. Before the commencement of construction of a private water system, the owner shall first obtain a written permit from the City. The application for said permit shall be made on a form furnished by the City, which the applicant shall supplement by plans, specifications and other information as may be deemed necessary by the City. A permit and inspection fee as set forth in a resolution of the City Council shall be paid to the City at the time the application is filed.

B. A permit for a private water system shall not permit the use of the system until the installation is completed to the standards of the City. The City shall be allowed to inspect the work at any stage of construction, and the applicant for the permit shall notify the City when the work is ready for various inspections, and before any underground works are covered.

C. The type, capacities, location and layout of a private water system shall comply with all of the rules and regulations and recommendations of the Department of Health and Welfare of the State of Idaho.
D. At such times as the municipal water system becomes available to the property served by the private water system, the owner or tenant shall make application for connection to the municipal water service. It is mandatory that, once connected to the municipal water service, the private water supply is not connected or cross-connected in any way to the water lines or facilities served by the municipal water system nor shall the private water service be used for domestic water.
E. The owners shall operate and maintain the private water facility in a sanitary manner at all times, and at no expense to the City.
F. No statement contained in this Section shall be construed to interfere with any additional requirements that may be imposed by the Department of Health and Welfare of the State of Idaho.

Section 10 FIRE HYDRANTS.

It shall be unlawful for any person, except one duly authorized by the City, to open, close, operate, turn on, turn off, interfere with, attach any pipe or hose to, or connect anything with, any fire hydrant or auxiliary valve belonging to the City. Further, it shall be unlawful for any person to obstruct the access to any fire hydrant by placing around or thereon any stone, brick, lumber, dirt, or other material, or to willfully or carelessly injure the same. No one shall use hydrants without City approval.

Section 11 POWERS AND AUTHORITY OF CITY AUTHORIZED REPRESENTATIVE.

The City, through its authorized representative bearing proper credentials and identification, may be permitted at proper and reasonable hours of the day, upon request by the City, to enter premises or buildings to which water is furnished from the municipal water system for necessary testing. Nothing in this provision shall limit the authority of the City to take such steps as it may deem appropriate to maintain the integrity of the

City water system including disconnection of any service reasonably believed to be a source or location of potential contamination.

Section 12 INSPECTION.

All connections to or extensions of a service line, requiring connection to an existing City Water Line, shall be made in accordance with the requirements of the State of Idaho Plumbing Code for such installations. The connection of any service line to the Municipal system shall be inspected by the City before the installation is backfilled and before the water is turned on for use at the premises.

Section 13 REJECTIONS OR DISAPPROVALS.

The City may reject any material or workmanship for non-compliance and upon such order, rejected material shall be removed and replaced with approved material or workmanship. Disapproved workmanship shall cause the removal and replacement of all materials involved, including appurtenances, excavation, backfilling, and other work items.

Section 14 BASIS FOR BASE RATE CHARGES.

There is hereby established a system of periodic service charges and fees for the use of and for services rendered by the water system of the City, and such charges and fees shall be as nearly uniform as possible to the different classes of property served by said system. All rates, charges and fees are hereby levied and assessed against each lot, parcel of land, building or property having any water service connection of the City Water System. It is specifically enacted that all property in the City to which public water is available, but is not used by the owner or occupants of said parcel of land, is still subject to base rate charges under the provisions of this Ordinance, to cover the fixed cost of availability of the water system and the cost of standby fire protection.

Section 15 USER RATES, CHARGES AND CONNECTION FEES.

All base rates, user charges, connection/reconnection/ disconnection fees, delinquent fees, and any deposit required for connection of service shall be set by resolution of the City Council. All monthly water rates, charges and fees will be charged against the property for which the City water service line is installed.

Section 16 MODIFICATION OF USER RATES AND/OR CONNECTION FEES.

The City Council of the City of Clark Fork may change or modify the rates, charges and fees referenced within this Ordinance upon any resolution of the City Council duly passed to become effective on the date as established by said resolution.

Section 17 USER CHARGES; WHEN DUE AND PAYABLE.

All base rate and user charges shall be due and payable to the City Clerk on the first of each calendar quarter and upon failure to pay the same within thirty (30) days of the first of each quarter, as prescribed, each user shall pay, in addition to the amount due, a delinquent fee as set forth in a resolution of the City Council.

Section 18 DISCONTINUANCE OF WATER SERVICE FOR DEFAULT.

The City of Clark Fork may discontinue water service to any defaulting customer after fifteen (15) days written notice to said customer. In such event, a reconnection fee, as set forth in a resolution of the City Council, shall be assessed against said customer upon request for reconnection. Reconnection of water service shall be made following the payment of any reconnection and delinquent fees due. The City may accept a contingent payment plan by the user/property owner.

Section 19 CONNECTION/DISCONNECTION OF SERVICES.

Should an owner or his agent request a City water service line to be disconnected, the City shall disconnect the same by closing the meter. There will be no charge for this disconnect/reconnect service if it is requested during the City Maintenance Personnel's normal working hours. If the request is made during non-working hours, the owner, or his agent, shall pay to the City a disconnect fee. The owner or his agent must request the City to place the line back in service before the meter is to be reopened and shall pay a reconnection fee. The disconnect and reconnect fees shall be as set forth in a resolution of the City Council.

Section 20 PROPERTY OWNER RESPONSIBILITY.

The property owner shall have the ultimate responsibility for any water charges for a property which he owns irrespective of any user or tenant service agreement.

Section 21 DELINQUENCY; NOTICE.

All delinquent charges or fees, as provided in this Ordinance, not paid within fifteen (15) days of the date when notice of delinquency is sent, shall be imposed as a lien against and upon the property or premises against which such charge or fee is levied or assessed. The City Clerk shall certify such delinquencies together with all penalties to the Tax Collector of Bonner County, and when so certified the same shall be a lien upon the property, and will be collectible as other taxes. In addition to the above, the City may disconnect the water service line and such corporation stop shall not be opened or placed back into service until all delinquency charges and fees have been paid in full as provided in Section 15 of this Ordinance. All moneys collected by the Bonner County Tax Collector under the provisions of this Section shall be paid over to the City Clerk in the same manner as is required for the payment of other City moneys.

Section 22 WATER SYSTEM FUND.

All fees and charges received and collected under authority of this Ordinance shall be deposited and credited to a special fund to be designated as the Water System Fund. The accounts of said fund shall show all receipts and expenditures for the maintenance, operation, upkeep and repair of the domestic water system and any payments into a sinking fund established for the purpose of paying principal of and interest on the water bond indebtedness of the City of Clark Fork which shall from time to time be outstanding. As provided by law, when budgeted and appropriated, the funds and credits to the account of the Water System shall be available for the payment of the requirements of maintenance, operation, repairs and upkeep of the domestic water system of the City, and to the extent legally available, for payment into a sinking fund established for the payment of the principal of and interest on any water bond indebtedness of the City which shall from time to time be outstanding.

Section 23 PENALTIES.

A. Any person found to be violating any provision of this Ordinance shall be served by the City with written notice stating the nature of the violation and providing a

reasonable time limit, but in any event, not to exceed ninety (90) days, for the satisfactory correction thereof. The offender shall, within the period of time stated in such notice, permanently cease all violations.

B. Any person who shall continue any violation beyond the time limit provided for in this Section, shall be guilty of a misdemeanor, and upon conviction thereof shall be subject to a fine not exceeding One Thousand Dollars ($1000.00), or imprisonment not to exceed six (6) months for each violation or by both. Each day in which any such violation shall continue shall be deemed a separate offense.

C. Any person violating any of the provisions of this Ordinance shall become liable to the City for any expense, loss or damage occasioned by the City by reason of such violation, including attorney fees and court costs.

Section 24 EMERGENCY CLAUSE.

There is hereby reserved to the City the right to temporarily discontinue or restrict the quantity of water delivered to all users of the system in the event of a need arising from:

A. Repair, maintenance, improvement or replacement of components of the water supply or distribution system; or

B. Emergencies, acts of God, or other circumstances beyond the reasonable control of the City.

Section 25 REPEALER CLAUSE.

This ordinance repeals ordinances 214, 240 and 249 in their entirety and Section 2 "Water Facilities" of Ordinance #221 & Section 7 "Water Facilities" of Ordinance #223 & Section 5.1-3(1) "Utilities" of Ordinance #225.

Section 26 SEVERABILITY CLAUSE.

If any section, subsection, sentence, clause, phrase or word of this Ordinance is declared to be invalid by a court of competent jurisdiction, such declaration shall not affect the validity of the remaining portions of this Ordinance.

Section 27 PUBLICATION AND EFFECTIVE DATE.

This Ordinance shall be in full force and effect upon its passage, approval and publication in one issue of the Bonner County Daily Bee, a newspaper of general circulation, published in the city of Sandpoint, Idaho.

Passed under suspension of the rules and duly enacted by the City Council as an Ordinance of the City of Clark Fork on the 8th day of December, 2008.

Approved by the Mayor on the 8th day of December, 2008.

Thomas A. Shields

Thomas A. Shields, Mayor

CITY COUNCIL MEMBERS	YES	NO	ABSENT	ABSTAIN
Linda Reed	X	___	___	___
Brian Cantrell	X	___	___	___
James Junget	X	___	___	___
Russell Schenck	X	___	___	___

ATTEST: Jonell Davisson

Jonell Davisson, City Clerk

Memo to Water Ordinance No. 251

Regular Council Meeting minutes of 4/13/98 decision:

> "The Council decided that 3/4" water meters would no longer be installed in Clark Fork. The smallest will be a 1" meter as the State Code requires 1" water lines."

Appendix A-4

City of Clark Fork's Water Rate Ordinance

RESOLUTION NO. 6-2018
CITY OF CLARK FORK, IDAHO

A RESOLUTION OF THE CITY COUNCIL OF CLARK FORK, IDAHO SETTING FORTH THE WATER USER CHARGES AND THE CONNECTION FEES FOR THE CITY OF CLARK FORK, IDAHO.

WHEREAS the City Council of the City of Clark Fork has passed Water Ordinance No. 251.

AND WHEREAS Ordinance No. 251 specifies that all rates, charges and fees will be set by resolution;

NOW THEREFORE, BE IT RESOLVED BY THE MAYOR AND COUNCIL OF THE CITY OF CLARK FORK, IDAHO THAT AS OF OCTOBER 1, 2018: All owners or agents must make application for connection to the water system on a form provided by the city and the owner or agent therefore of all properties connecting to the water system under the terms of this Ordinance of the City shall pay the following rates, charges and fees for the services provided. All other users will require special appraisal and will be computed on an individual basis.

A. WATER USAGE CHARGES

1. Residential

Base Rate:
$24.78 per month per user
Every user will pay this base rate whether water is used or not.

NOTE: Each residence, mobile home or business supplied with water from a meter is considered a separate user. There may be more than one user on a meter.

User Charge:
$1.89 per each 1,000 gallons
This charge is in addition to the base rate charge to all customers using water based on the meter reading.

2. Commercial

Base Rate: (per meter size per month)

	Meter Size
$33.76	¾ inch
$44.69	1 inch
$121.95	2 inch
$304.87	3&4 inch

User Charge:
$1.89 per each 1,000 gallons
This charge is in addition to the base rate charge to all customers using water based on the meter reading.

3. Use of Water from Fire Hydrants
Water taken from fire hydrants for purposes other than use by the Fire Department:
$15.93 per each 1,000 gallons

B. DELINQUENT FEE
Failure to pay water charges within 30 days of due date:
$20.00

C. CONNECT AND DISCONNECT FEES
Customer requested connects and disconnect of service during non-business hours.
(Water turn-on or turn-off at meter)

1. Connect Fee:
   $25.00

2. Disconnect Fee:
   $25.00

No charge for connects or disconnect during normal business hours.

D. WATER METER INSTALLATION AND SERVICE CONNECTION FEES

A non-refundable deposit of 10% of the connection fee is required at time of application. Deposit will be applied to installation fee at time of full payment.

(per meter size)	Meter Size
$5,000.00	1 inch
$6,500.00	2 inch
$8,500.00	3 inch
$12,500.00	4 inch

The City shall provide the meter, meter box, connection to the main, corporation stop and other materials as required. The full fee **MUST** be paid prior to installation.

E. FIRE SERVICE CONNECTION FEE

A non-refundable deposit of 10% of the connection fee is required at time of application. Deposit will be applied to installation fee at time of full payment.

$8,500.00 - up to a 4 inch connection.
Larger connections will be addressed on an as need basis.

F. PRIVATE WATER SYSTEM
Permit and Inspection Fee:
$100.00

Water meters will be read at the end of each month and billing will be mailed to customers on the first day of each quarter. No credit will be given for water lost due to leakage of the property owners system.

BE IT FURTHER RESOLVED THAT: This resolution shall replace Resolution No. 5-2017 in its entirety and that this resolution shall be in full force and effect upon its passage and approval of the Clark Fork City Council.

PASSED AND APPROVED this 10th day of September 2018.

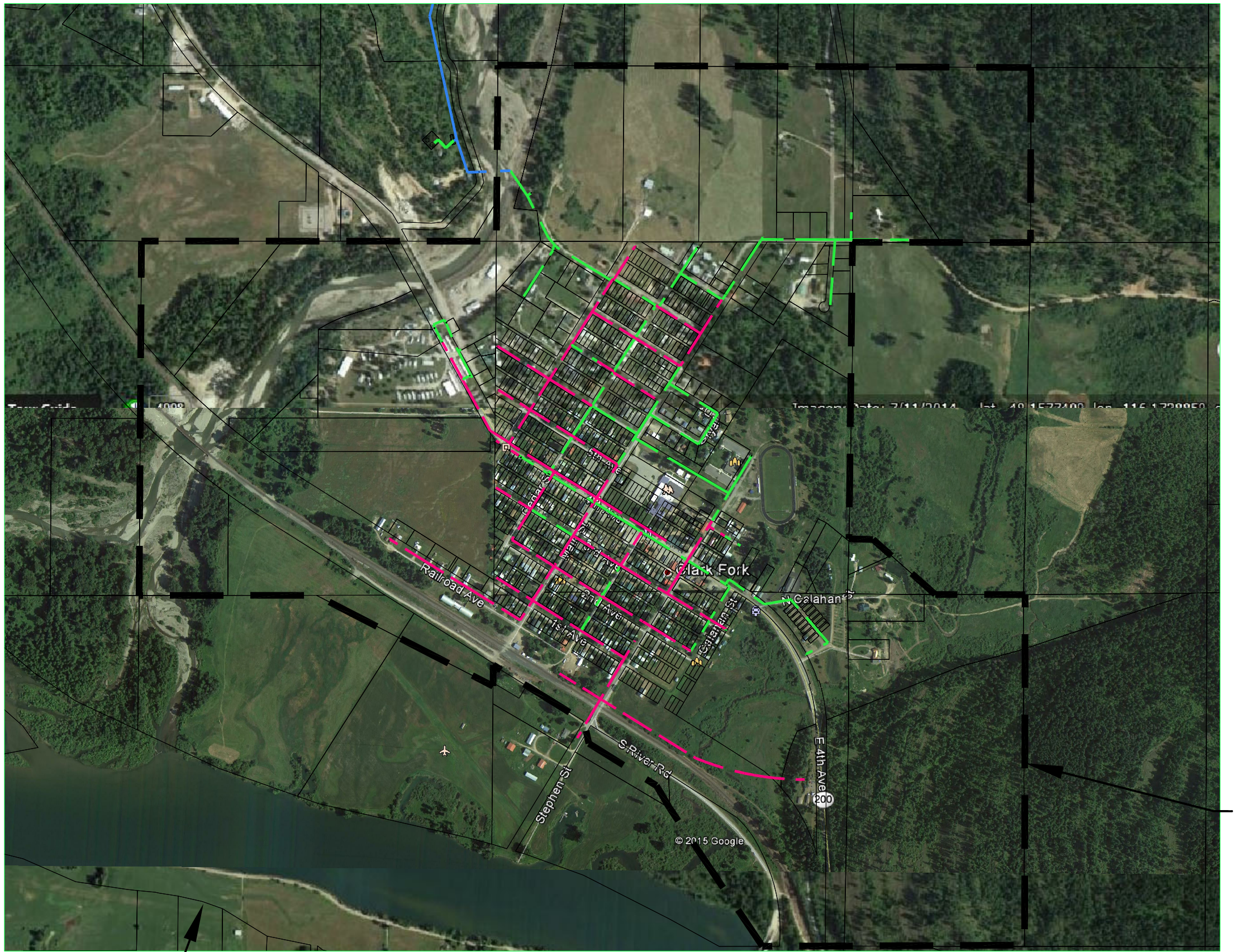
Russell Schenck, Mayor

CITY COUNCIL MEMBERS	YES	NO	ABSENT
Shari Jones	√		
Jay White	√		
Sharon Banning	√		
Stanley Spanski			√

ATTEST: Amber Burgess, City Clerk

Appendix A-5

City of Clark Fork Maps



SERVICE AREA / CITY LIMITS

BONNER COUNTY PARCELS

Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES
106 W MISSION AVENUE | SPOKANE, WA 99201
P 509.328.3371 WWW.PARAMETRIX.COM

NORTH

1" = 800'

SERVICE AREA

CITY OF CLARK FORK
WATER SYSTEM PLAN

LEGEND

4"CI — EXISTING CAST IRON PIPE

4"PVC — EXISTING PVC PIPE

4"STL — EXISTING STEEL PIPE

PIPE SIZE AND MATERIAL

EXISTING SPRING CREEK WELL SITE

EXISTING WATER TANK SITE

9TH ST WELL SITE

CITY LIMITS

HWY 200

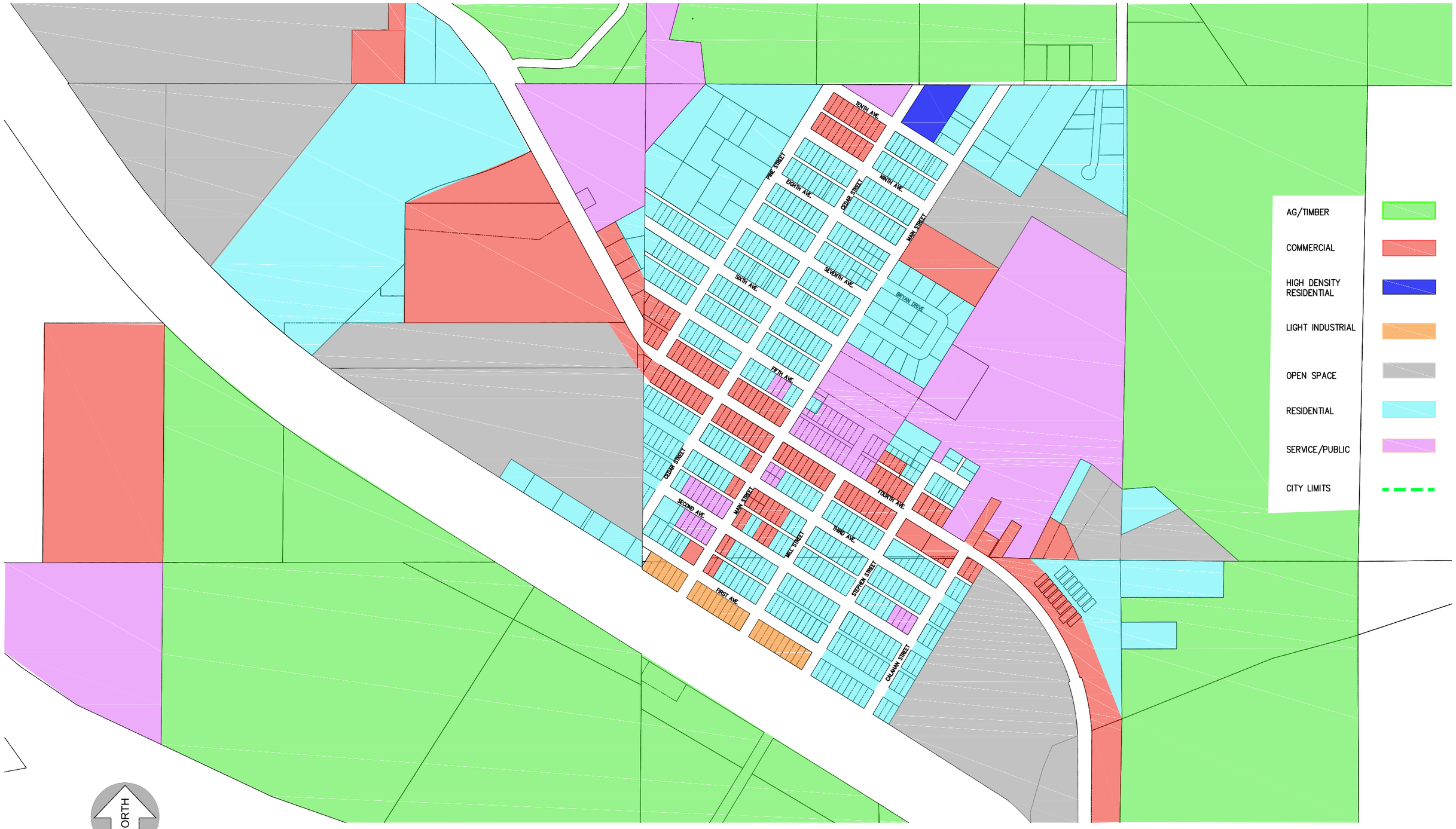
BNSF RR

NORTH

TENTH AVE.
NINTH AVE.
EIGHTH AVE.
SEVENTH AVE.
SIXTH AVE.
FIFTH AVE.
FOURTH AVE.
THIRD AVE.
SECOND AVE.
FIRST AVE.
PINE STREET
CEDAR STREET
MAIN STREET
WIL STREET
STEPHEN STREET
CALAHAN STREET
BRYAN DRIVE

Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES
106 W MISSION AVENUE | SPOKANE, WA 99201
P 509.328.3371
WWW.PARAMETRIX.COM

CLARK FORK EXISTING WATER FACILITIES MAP



SCALE: 1" = 500 FEET

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P 509.328.3371 WWW.PARAMETRIX.COM

LANDUSE MAP

CITY OF CLARK FORK
WATER SYSTEM PLAN

CITY of CLARK FORK

1"=100'

NORTH

LEGEND

- CAST IRON
- PVC
- WATER METER
- WATER VALVE
- HYDRANT - LESS THAN 500 GAL/MIN
- HYDRANT 500-1000 GAL/MIN
- HYDRANT 1000 GAL+ GAL/MIN

1
40.00

9
14.25

M.C.

EAST

ROLLYS ADD.

TENTH AVE.

NINTH AVE.

EIGHTH AVE.

SEVENTH AVE.

SIXTH AVE.

FIFTH AVE.

FOURTH AVE.

THIRD AVE.

SECOND AVE.

FIRST AVE.

PINE STREET

CEDAR STREET

MAIN STREET

MILL STREET

STEPHEN STREET

CALAHAN STREET

COUNTY RD.

COUNTY RD.

98-232

RR PARK

R.R. Property

R.R. property

NO ALLEY

STORAGE UNITS

SEPTIC RD

- NOT -

Proposed 1700' 10" pipe to Lake

Rod FERRIS

Appendix B-1

Water Meter Data

Spring Creek Water Usage Records

Monthly Avr.	2009	2010	2011	2012	2013	2014	2015	2016	Monthly Avr.	2017	2018
Jan	1556406	1656700	2408700	2152650	3478400	3348600	1298.2	1292.4	Jan	1952.2	1419.6
Feb	1429900	1287700	2047100	2128500	2955000	3182500	1101.6	1166.2	Feb	1985.2	1214.7
Mar	1788100	1464200	2250600	2345000	3331100	3300400	1372.2	1321.9	Mar	1561.6	1534.3
Apr	1523200	1532300	2191800	2165600	3208000	3094	1143.9	1257.7	Apr	1210.2	1269.1
May	1876500	1985100	2439100	2409100	3623300	3373.2	2039.7	2163.8	May	1721.9	1773.9
Jun	2837100	2037300	2684400	2176600	3279530	3402.4	4089.1	2817.1	Jun	2198	2484.7
Jul	3814200	3214900	4163500	3745300	5239500	5393.9	4998.5	3247.6	Jul	5102.5	4271.3
Aug	3037500	4787200	5736800	4320900	5142300	4886.8	4963.8	3574.2	Aug	7216.9	
Sep	2378800	2717100	4559100	3362800	3974700	4069.2	3382.6	2256.3	Sep	5980	
Oct	1448600	7309200	2646200	3476900	2758200	3382.2	3738.4	1615.2	Oct	1190.8	
Nov	1340800	2233000	2542200	2111200	2815600	2140.7	3006.2	1241.9	Nov	1199.9	
Dec	1790200	2487300	2566900	2766600	3296100	1592.5	1200	1488.7	Dec	1275.4	

Daily Avr.								2016	Daily Avr.	2017	2018
Jan	50206	53442	77700	69440	112210	108019	41.8	41.6	Jan	62.9	45.7
Feb	51067	45989	73110	73396	105535	113660	39.3	40.2	Feb	70.9	43.3
Mar	57680	47232	72600	75650	107454	100645	44.2	42.6	Mar	50.3	47.9
Apr	50773	51077	73060	72187	106933	103133	38.1	41.9	Apr	40.3	42.3
May	60532	64035	78680	77713	116880	108.8	65.7	69.8	May	55.5	57.2
Jun	94570	65719	89480	72553	109317	113.4	136.3	93.9	Jun	73.2	82.8
Jul	123038	103706	134306	120816	169016	173.9	161.2	104.7	Jul	164.5	137.7
Aug	97983	154426	184900	139158	165880	157.6	160.1	115.2	Aug	232.8	
Sep	79293	90570	151970	112093	132490	135.6	112.7	75.2	Sep	199.3	
Oct	46729	74490	85361	112158	88974	109.1	120.5	52.1	Oct	38.4	
Nov	43251	74430	84740	70373	93900	71.3	100.2	41.3	Nov	39.9	
Dec	57748	80235	82803	89250	106325	51.37	38.7	48	Dec	41.1	

Appendix B-2

Fire Marshall Letter

August 20, 2018

KJ Hanley, P.E.

Parametrix, Inc.

106 W. Mission Ave

Spokane, WA 99201

Dear KJ,

I have reviewed the 2015 International Fire Code - Appendix B (See attached), and I am in concurrence with the minimum fire flow values of 1,000 GPM for Single Family Residential housing units. However, the Single Family Residential goal for the system is 1500-GPM for 2 hours which is equivalent to 180,000 gallons for the total available fire flow storage volume. Commercial, industrial and other larger building fire flow minimums for the City are 1500-GPM, and the goals will vary by building per IFC Appendix B. All minimum fire flows are measured at a 20-psi minimum residual system pressure.

City of Clark Fork Fire Flow Requirements			
	Minimum Values		Goals
Customer Class	Flow (GPM)	Duration (Hr.)	Flow (GPM)
Single Family Residential <3,600 sq.ft.	1000	1 Hr.	1500
Industrial and Commercial	1500	2 Hr.	Varies per Building per IFC Appendix B

I have reviewed the option to nest the Standby Storage inside of the Fire Flow Storage, and find it acceptable.

Finally, I have reviewed industry standards and recommendations for pipe velocities and have determined that the maximum pipeline velocity allowable within the City's water system shall be 10 feet per second.

Sincerely,

Richard Harter

Fire Chief

City of Clark Fork Fire Department

APPENDIX B

FIRE-FLOW REQUIREMENTS FOR BUILDINGS

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION B101
GENERAL

B101.1 Scope. The procedure for determining fire-flow requirements for buildings or portions of buildings hereafter constructed shall be in accordance with this appendix. This appendix does not apply to structures other than buildings.

SECTION B102
DEFINITIONS

B102.1 Definitions. For the purpose of this appendix, certain terms are defined as follows:

FIRE-FLOW. The flow rate of a water supply, measured at 20 pounds per square inch (psi) (138 kPa) residual pressure, that is available for fire fighting.

FIRE-FLOW CALCULATION AREA. The floor area, in square feet (m^2), used to determine the required fire flow.

SECTION B103
MODIFICATIONS

B103.1 Decreases. The fire chief is authorized to reduce the fire-flow requirements for isolated buildings or a group of buildings in rural areas or small communities where the development of full fire-flow requirements is impractical.

B103.2 Increases. The fire chief is authorized to increase the fire-flow requirements where conditions indicate an unusual susceptibility to group fires or conflagrations. An increase shall not be more than twice that required for the building under consideration.

B103.3 Areas without water supply systems. For information regarding water supplies for fire-fighting purposes in rural and suburban areas in which adequate and reliable water supply systems do not exist, the *fire code official* is authorized to utilize NFPA 1142 or the *International Wildland-Urban Interface Code.*

SECTION B104
FIRE-FLOW CALCULATION AREA

B104.1 General. The fire-flow calculation area shall be the total floor area of all floor levels within the *exterior walls*, and under the horizontal projections of the roof of a building, except as modified in Section B104.3.

B104.2 Area separation. Portions of buildings which are separated by *fire walls* without openings, constructed in accordance with the *International Building Code,* are allowed to be considered as separate fire-flow calculation areas.

B104.3 Type IA and Type IB construction. The fire-flow calculation area of buildings constructed of Type IA and Type IB construction shall be the area of the three largest successive floors.

Exception: Fire-flow calculation area for open parking garages shall be determined by the area of the largest floor.

SECTION B105
FIRE-FLOW REQUIREMENTS FOR BUILDINGS

B105.1 One- and two-family dwellings, Group R-3 and R-4 buildings and townhouses. The minimum fire-flow and flow duration requirements for one- and two-family *dwellings*, Group R-3 and R-4 buildings and townhouses shall be as specified in Tables B105.1(1) and B105.1(2).

B105.2 Buildings other than one- and two-family dwellings, Group R-3 and R-4 buildings and townhouses. The minimum fire-flow and flow duration for buildings other than one- and two-family *dwellings*, Group R-3 and R-4 buildings and townhouses shall be as specified in Tables B105.2 and B105.1(2).

TABLE B105.1(1)
REQUIRED FIRE-FLOW FOR ONE- AND TWO-FAMILY DWELLINGS, GROUP R-3 AND R-4 BUILDINGS AND TOWNHOUSES

FIRE-FLOW CALCULATION AREA (square feet)	AUTOMATIC SPRINKLER SYSTEM (Design Standard)	MINIMUM FIRE-FLOW (gallons per minute)	FLOW DURATION (hours)
0-3,600	No automatic sprinkler system	1,000	1
3,601 and greater	No automatic sprinkler system	Value in Table B105.1(2)	Duration in Table B105.1(2) at the required fire-flow rate
0-3,600	Section 903.3.1.3 of the *International Fire Code* or Section P2904 of the *International Residential Code*	500	1/2
3,601 and greater	Section 903.3.1.3 of the *International Fire Code* or Section P2904 of the *International Residential Code*	1/2 value in Table B105.1(2)	1

For SI: 1 square foot = 0.0929 m^2, 1 gallon per minute = 3.785 L/m.

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TABLE B105.1(2)
REFERENCE TABLE FOR TABLES B105.1(1) AND B105.2

FIRE-FLOW CALCULATION AREA (square feet)					FIRE-FLOW (gallons per minute)[b]	FLOW DURATION (hours)
Type IA and IB[a]	Type IIA and IIIA[a]	Type IV and V-A[a]	Type IIB and IIIB[a]	Type V-B[a]		
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1,500	2
22,701-30,200	12,701-17,000	8,201-10,900	5,901-7,900	3,601-4,800	1,750	
30,201-38,700	17,001-21,800	10,901-12,900	7,901-9,800	4,801-6,200	2,000	
38,701-48,300	21,801-24,200	12,901-17,400	9,801-12,600	6,201-7,700	2,250	
48,301-59,000	24,201-33,200	17,401-21,300	12,601-15,400	7,701-9,400	2,500	
59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9,401-11,300	2,750	
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	3
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	
97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3,500	
112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3,750	
128,701-145,900	72,401-82,100	46,401-52,500	33,501-37,900	20,601-23,300	4,000	4
145,901-164,200	82,101-92,400	52,501-59,100	37,901-42,700	23,301-26,300	4,250	
164,201-183,400	92,401-103,100	59,101-66,000	42,701-47,700	26,301-29,300	4,500	
183,401-203,700	103,101-114,600	66,001-73,300	47,701-53,000	29,301-32,600	4,750	
203,701-225,200	114,601-126,700	73,301-81,100	53,001-58,600	32,601-36,000	5,000	
225,201-247,700	126,701-139,400	81,101-89,200	58,601-65,400	36,001-39,600	5,250	
247,701-271,200	139,401-152,600	89,201-97,700	65,401-70,600	39,601-43,400	5,500	
271,201-295,900	152,601-166,500	97,701-106,500	70,601-77,000	43,401-47,400	5,750	
295,901-Greater	166,501-Greater	106,501-115,800	77,001-83,700	47,401-51,500	6,000	
—	—	115,801-125,500	83,701-90,600	51,501-55,700	6,250	
—	—	125,501-135,500	90,601-97,900	55,701-60,200	6,500	
—	—	135,501-145,800	97,901-106,800	60,201-64,800	6,750	
—	—	145,801-156,700	106,801-113,200	64,801-69,600	7,000	
—	—	156,701-167,900	113,201-121,300	69,601-74,600	7,250	
—	—	167,901-179,400	121,301-129,600	74,601-79,800	7,500	
—	—	179,401-191,400	129,601-138,300	79,801-85,100	7,750	
—	—	191,401-Greater	138,301-Greater	85,101-Greater	8,000	

For SI: 1 square foot = 0.0929 m^2, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.
a. Types of construction are based on the *International Building Code*.
b. Measured at 20 psi residual pressure.

TABLE B105.2
REQUIRED FIRE-FLOW FOR BUILDINGS OTHER THAN ONE- AND TWO-FAMILY DWELLINGS, GROUP R-3 AND R-4 BUILDINGS AND TOWNHOUSES

AUTOMATIC SPRINKLER SYSTEM (Design Standard)	MINIMUM FIRE-FLOW (gallons per minute)	FLOW DURATION (hours)
No automatic sprinkler system	Value in Table B105.1(2)	Duration in Table B105.1(2)
Section 903.3.1.1 of the *International Fire Code*	25% of the value in Table B105.1(2)[a]	Duration in Table B105.1(2) at the reduced flow rate
Section 903.3.1.2 of the *International Fire Code*	25% of the value in Table B105.1(2)[b]	Duration in Table B105.1(2) at the reduced flow rate

For SI: 1 gallon per minute = 3.785 L/m.
a. The reduced fire-flow shall be not less than 1,000 gallons per minute.
b. The reduced fire-flow shall be not less than 1,500 gallons per minute.

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B105.3 Water supply for buildings equipped with an automatic sprinkler system. For buildings equipped with an approved *automatic sprinkler system*, the water supply shall be capable of providing the greater of:

1. The *automatic sprinkler system* demand, including hose stream allowance.
2. The required fire-flow.

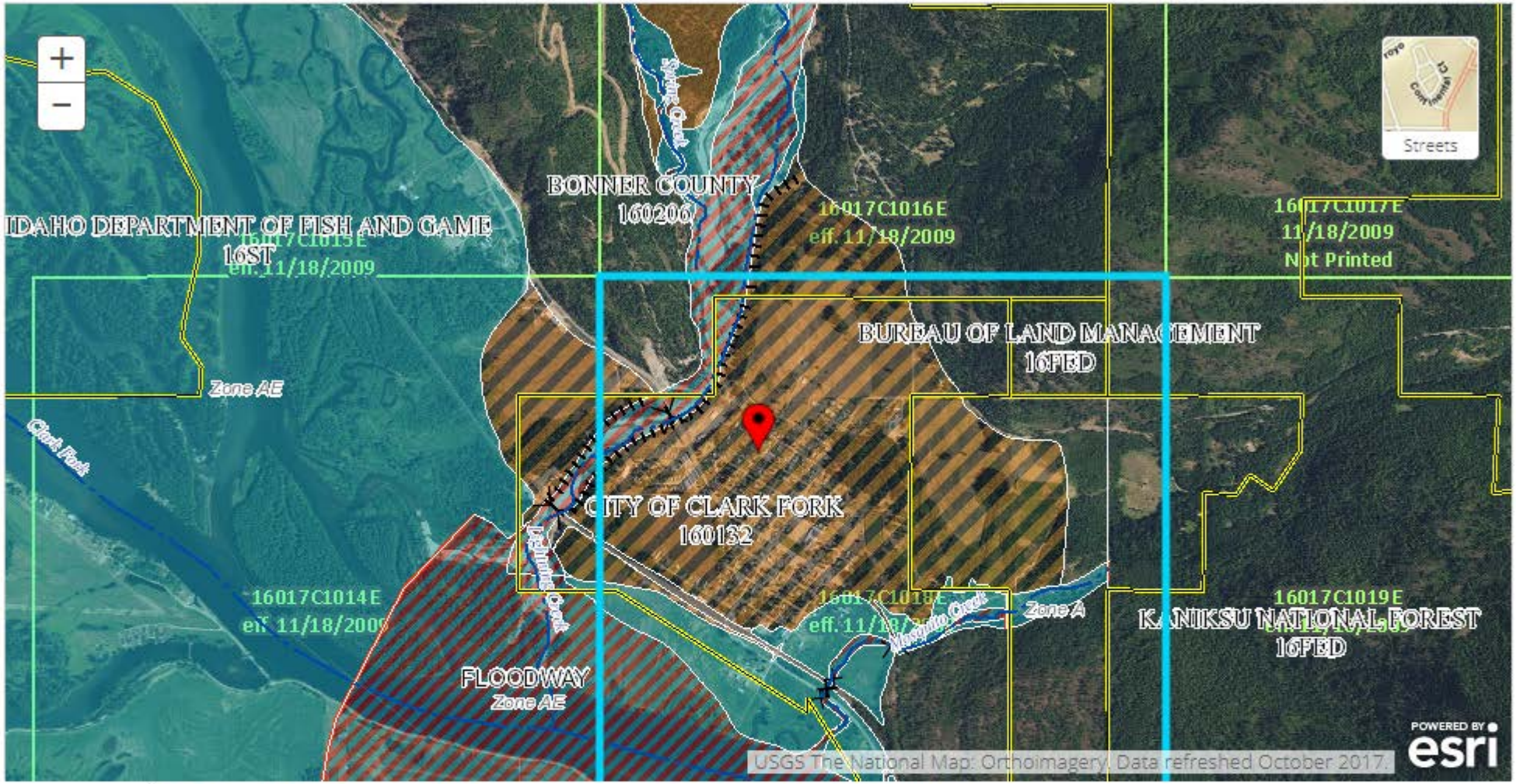
SECTION B106
REFERENCED STANDARDS

ICC	IBC—15	International Building Code	B104.2,
ICC	IFC—15	International Fire Code	Tables B105.1(1) and B105.2
ICC	IWUIC—15	International Wildland-Urban Interface Code	B103.3
ICC	IRC—15	International Residential Code	Table B105.1(1)
NFPA	1142—12	Standard on Water Supplies for Suburban and Rural Fire Fighting	B103.3

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Appendix B-3

FEMA Flood Map



PIN
- Approximate location based on user input and does not represent an authoritative property location

MAP PANELS
- Selected FloodMap Boundary
- Digital Data Available
- No Digital Data Available
- Unmapped

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth
- Regulatory Floodway *Zone AE, AO, AH, VE, AR*

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER FEATURES
- 20.2 / 17.5 — Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

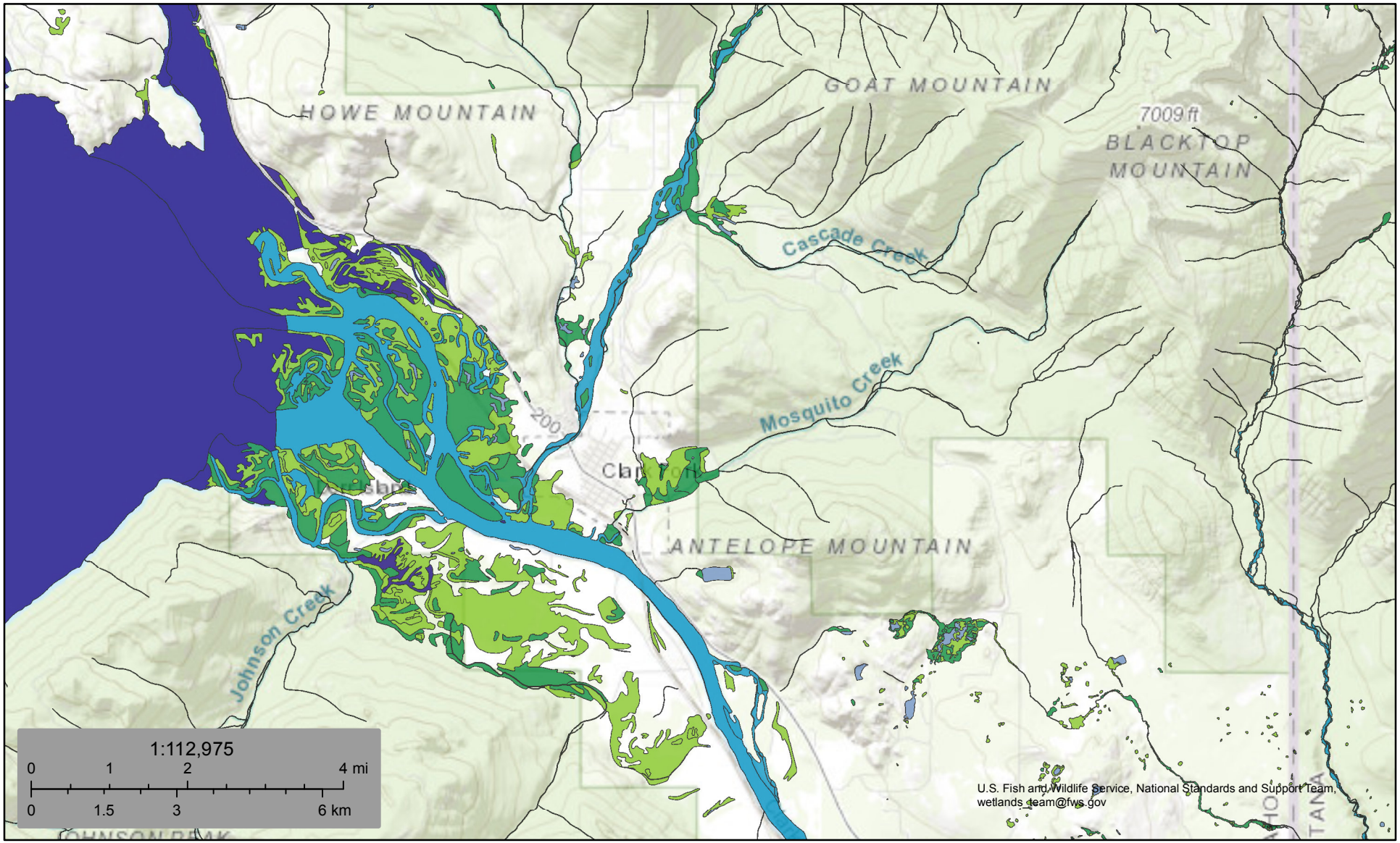
Appendix B-4

Wetland Map

U.S. Fish and Wildlife Service

National Wetlands Inventory

City of Clark Fork Wetland Mapping



August 15, 2018

Wetlands

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

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Appendix C-1

Water Modeling Results for Base Year – Peak Hourly Demand Analysis

FlexTable: Junction Table

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Unit Demand Collection <Count>	Demand (gpm)
J-1	2,119.00	2,221.40	44	1	0
J-2	2,119.00	2,221.21	44	1	0
J-3	2,117.00	2,220.96	45	1	0
J-4	2,117.00	2,220.76	45	1	0
J-5	2,116.00	2,220.45	45	1	0
J-6	2,116.00	2,220.38	45	1	0
J-7	2,116.00	2,220.37	45	1	2
J-8	2,112.00	2,219.97	47	1	3
J-9	2,112.00	2,219.95	47	1	0
J-10	2,109.00	2,219.69	48	1	10
J-11	2,109.00	2,219.65	48	1	0
J-12	2,106.00	2,219.49	49	1	7
J-13	2,104.00	2,219.42	50	1	4
J-14	2,103.00	2,219.33	50	1	8
J-15	2,101.00	2,219.29	51	1	7
J-16	2,100.00	2,219.29	52	1	0
J-17	2,100.00	2,219.22	52	1	2
J-18	2,097.00	2,219.22	53	1	10
J-19	2,094.00	2,219.19	54	1	3
J-20	2,093.00	2,219.17	55	1	9
J-21	2,089.00	2,219.16	56	1	0
J-22	2,089.00	2,219.16	56	1	11
J-23	2,087.00	2,219.12	57	1	0
J-24	2,087.00	2,219.11	57	1	9
J-25	2,085.00	2,219.11	58	1	0
J-26	2,116.00	2,220.38	45	1	0
J-27	2,116.00	2,220.38	45	1	0
J-28	2,116.00	2,220.38	45	1	0
J-29	2,113.00	2,220.38	46	1	6
J-30	2,110.00	2,219.55	47	1	2
J-31	2,111.00	2,219.54	47	1	4
J-32	2,111.00	2,219.54	47	1	0
J-33	2,109.00	2,219.68	48	1	0
J-34	2,107.00	2,219.54	49	1	9
J-35	2,106.00	2,219.41	49	1	9
J-36	2,106.00	2,219.41	49	1	0
J-37	2,103.00	2,219.29	50	1	8
J-38	2,101.00	2,219.24	51	1	10
J-39	2,098.00	2,219.20	52	1	9
J-40	2,094.00	2,219.19	54	1	0
J-41	2,108.00	2,219.49	48	1	0
J-42	2,108.00	2,219.49	48	1	10
J-43	2,108.00	2,219.49	48	1	0
J-44	2,110.00	2,219.48	47	1	0
J-45	2,109.00	2,219.31	48	1	0
J-46	2,109.00	2,219.30	48	1	0
J-47	2,108.00	2,219.30	48	1	0
J-48	2,113.00	2,219.30	46	1	1

FlexTable: Junction Table

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Unit Demand Collection <Count>	Demand (gpm)
J-49	2,104.00	2,219.24	50	1	2
J-50	2,110.00	2,219.48	47	1	0
J-51	2,112.00	2,219.94	47	1	0
J-52	2,112.00	2,219.92	47	1	0
J-53	2,112.00	2,219.92	47	1	0
J-54	2,114.00	2,219.91	46	1	3
J-55	2,114.00	2,219.91	46	1	0
J-56	2,112.00	2,219.92	47	1	0
J-57	2,110.00	2,219.54	47	1	10
J-58	2,109.00	2,219.35	48	1	9
J-59	2,107.00	2,219.41	49	1	0
J-60	2,102.00	2,219.41	51	1	0
J-61	2,100.00	2,219.29	52	1	0
J-62	2,100.00	2,219.30	52	1	2
J-63	2,099.00	2,219.30	52	1	3
J-64	2,098.00	2,219.29	52	1	2
J-65	2,096.00	2,219.22	53	1	0
J-66	2,093.00	2,219.21	55	1	4
J-67	2,096.00	2,219.20	53	1	7
J-68	2,091.00	2,219.18	55	1	0
J-69	2,091.00	2,219.18	55	1	6
J-70	2,088.00	2,219.17	57	1	9
J-71	2,090.00	2,219.18	56	1	0
J-72	2,088.00	2,219.18	57	1	1
J-73	2,086.00	2,219.16	58	1	0
J-74	2,086.00	2,219.16	58	1	0
J-75	2,084.00	2,219.16	58	1	3
J-76	2,086.00	2,219.16	58	1	3
J-77	2,084.00	2,219.16	58	1	1
J-78	2,086.00	2,219.16	58	1	3
J-79	2,086.00	2,219.16	58	1	4
J-80	2,085.00	2,219.15	58	1	4
J-81	2,083.00	2,219.15	59	1	4
J-82	2,084.00	2,219.13	58	1	7
J-83	2,107.00	2,219.53	49	1	0
J-84	2,104.00	2,219.43	50	1	0
J-85	2,103.00	2,219.29	50	1	0
J-86	2,106.00	2,219.22	49	1	9
J-87	2,109.00	2,219.20	48	1	7
J-88	2,109.00	2,219.33	48	1	0
J-89	2,103.00	2,219.12	50	1	7
J-90	2,100.00	2,218.88	51	1	7
J-91	2,091.00	2,219.18	55	1	4
J-92	2,100.00	2,218.90	51	1	0
J-93	2,099.00	2,218.95	52	1	0
J-94	2,098.00	2,219.20	52	1	0
J-95	2,090.00	2,219.19	56	1	0
J-96	2,090.00	2,219.19	56	1	0

FlexTable: Junction Table

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Unit Demand Collection <Count>	Demand (gpm)
J-97	2,104.00	2,219.12	50	1	0
J-98	2,103.00	2,219.13	50	1	0
J-99	2,098.00	2,219.20	52	1	0
J-100	2,096.00	2,219.16	53	1	7
J-102	2,096.00	2,219.16	53	1	0
J-103	2,091.00	2,219.16	55	1	6
J-104	2,091.00	2,219.18	55	1	0
J-105	2,088.00	2,219.14	57	1	9
J-106	2,088.00	2,219.14	57	1	0
J-107	2,087.00	2,219.13	57	1	0
J-108	2,087.00	2,219.13	57	1	9
J-109	2,084.00	2,219.12	58	1	0
J-110	2,084.00	2,219.11	58	1	9
J-111	2,087.00	2,219.11	57	1	0
J-113	2,087.00	2,219.16	57	1	0
J-114	2,087.00	2,219.15	57	1	9
J-115	2,085.00	2,219.15	58	1	0
J-116	2,083.00	2,219.15	59	1	1
J-117	2,084.00	2,219.11	58	1	4
J-118	2,084.00	2,219.07	58	1	0
J-119	2,085.00	2,218.74	58	1	0
J-120	2,080.00	2,218.72	60	1	1
J-121	2,079.00	2,218.73	60	1	3
J-122	2,077.00	2,218.69	61	1	0
J-123	2,078.00	2,218.67	61	1	0
J-124	2,080.00	2,218.65	60	1	0
J-125	2,110.00	2,218.65	47	1	1
J-126	2,085.00	2,219.13	58	1	0
J-127	2,099.00	2,219.20	52	1	0
J-128	2,099.00	2,219.20	52	1	0
J-129	2,099.00	2,219.20	52	1	0
J-130	2,100.00	2,219.20	52	1	0
J-131	2,087.00	2,219.08	57	1	6
J-132	2,100.00	2,218.46	51	1	2
J-133	2,102.00	2,217.47	50	1	26
J-134	2,107.00	2,217.43	48	1	22
J-135	2,106.00	2,217.45	48	1	0
J-136	2,106.00	2,217.46	48	1	1
J-137	2,106.00	2,217.46	48	1	0
J-138	2,104.00	2,217.46	49	1	0
J-139	2,102.00	2,217.46	50	1	3
J-140	2,098.00	2,219.21	52	1	0
J-141	2,094.00	2,219.19	54	1	0
J-142	2,098.00	2,219.20	52	1	0
J-143	2,121.00	2,221.40	43	1	0
J-144	2,130.00	2,221.40	40	1	0
J-145	2,135.00	2,221.40	37	1	0
J-146	2,146.00	2,221.40	33	1	0

FlexTable: Junction Table

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Unit Demand Collection <Count>	Demand (gpm)
J-147	2,155.00	2,221.40	29	1	0
J-148	2,170.00	2,221.40	22	1	0
J-151	2,181.00	2,221.40	17	1	0
J-152	2,187.00	2,221.40	15	1	0
J-153	2,190.00	2,221.40	14	1	0
J-154	2,190.00	2,221.40	14	1	0
J-303	2,095.00	2,219.15	54	1	6
J-306	2,085.60	2,219.10	58	0	0
J-307	2,101.99	2,219.31	51	1	0

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Length (ft)
P-1	257	J-1	J-2	12.0	Steel	100.0	405	1.15	257
P-2	321	J-2	J-3	12.0	Steel	100.0	405	1.15	321
P-3	226	J-3	J-4	10.0	PVC	150.0	405	1.65	226
P-4	346	J-4	J-5	10.0	PVC	150.0	405	1.65	346
P-5	77	J-5	J-6	10.0	PVC	150.0	405	1.65	77
P-6	16	J-6	J-7	10.0	PVC	150.0	399	1.63	16
P-7	472	J-7	J-8	10.0	PVC	150.0	397	1.62	472
P-8	20	J-8	J-9	10.0	PVC	150.0	393	1.61	20
P-10	25	J-10	J-11	4.0	Cast iron	130.0	43	1.09	25
P-11	370	J-11	J-12	4.0	Cast iron	130.0	21	0.54	370
P-12	286	J-12	J-13	4.0	Cast iron	130.0	16	0.40	286
P-13	156	J-13	J-14	4.0	PVC	150.0	29	0.74	156
P-14A	134	J-307	J-15	4.0	PVC	150.0	12	0.32	134
P-14B	136	J-14	J-307	4.0	PVC	150.0	12	0.32	136
P-15	174	J-15	J-16	4.0	PVC	150.0	7	0.17	174
P-16	35	J-16	J-17	4.0	PVC	150.0	55	1.41	35
P-17	236	J-17	J-18	10.0	PVC	150.0	29	0.12	236
P-19	294	J-19	J-20	8.0	Cast iron	150.0	58	0.37	294
P-20	258	J-20	J-21	8.0	Cast iron	150.0	36	0.23	258
P-21	11	J-21	J-22	8.0	Cast iron	150.0	36	0.23	11
P-22	285	J-22	J-23	4.0	Cast iron	150.0	14	0.36	285
P-23	17	J-23	J-24	4.0	Cast iron	150.0	14	0.36	17
P-24	174	J-24	J-25	4.0	Cast iron	150.0	6	0.14	174
P-25	13	J-6	J-26	8.0	PVC	150.0	6	0.04	13
P-26	10	J-26	J-27	8.0	PVC	150.0	6	0.04	10
P-27	20	J-27	J-28	8.0	PVC	150.0	6	0.04	20
P-28	407	J-28	J-29	6.0	PVC	150.0	6	0.06	407
P-29	300	J-11	J-30	4.0	PVC	150.0	21	0.54	300
P-30	232	J-30	J-31	4.0	PVC	150.0	4	0.11	232
P-31	10	J-31	J-32	4.0	PVC	150.0	0	0.00	10
P-32	14	J-10	J-33	10.0	PVC	150.0	298	1.22	14
P-33	275	J-33	J-34	10.0	PVC	150.0	298	1.22	275
P-34	296	J-34	J-35	10.0	PVC	150.0	273	1.12	296

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Length (ft)
P-35	9	J-35	J-36	10.0	PVC	150.0	261	1.07	9
P-36	294	J-36	J-37	10.0	PVC	150.0	261	1.07	294
P-37	269	J-37	J-38	10.0	PVC	150.0	191	0.78	269
P-39	387	J-39	J-40	10.0	PVC	150.0	68	0.28	387
P-40	10	J-40	J-19	8.0	Cast iron	150.0	68	0.43	10
P-41	366	J-30	J-41	4.0	PVC	150.0	15	0.37	366
P-42	4	J-41	J-42	4.0	PVC	150.0	13	0.34	4
P-43	48	J-42	J-43	4.0	PVC	150.0	3	0.09	48
P-44	488	J-43	J-44	4.0	PVC	150.0	3	0.09	488
P-45	548	J-44	J-45	2.0	PVC	150.0	3	0.34	548
P-46	120	J-45	J-46	2.0	PVC	150.0	1	0.11	120
P-47	428	J-46	J-47	2.0	PVC	150.0	0	0.00	428
P-48	204	J-46	J-48	2.0	PVC	150.0	1	0.11	204
P-49	488	J-45	J-49	2.0	PVC	150.0	2	0.23	488
P-50	21	J-44	J-50	4.0	PVC	150.0	0	0.00	21
P-51	300	J-12	J-41	4.0	Cast iron	130.0	-1	0.03	300
P-52	12	J-9	J-51	10.0	PVC	150.0	393	1.61	12
P-53	377	J-51	J-10	10.0	PVC	150.0	350	1.43	377
P-55	9	J-52	J-53	4.0	Cast iron	130.0	3	0.09	9
P-56	306	J-53	J-54	4.0	Cast iron	130.0	3	0.09	306
P-57	7	J-54	J-55	4.0	Cast iron	130.0	0	0.00	7
P-58	11	J-51	J-56	4.0	Cast iron	130.0	43	1.10	11
P-59	3	J-56	J-52	4.0	Cast iron	130.0	43	1.10	3
P-60	277	J-52	J-57	4.0	Cast iron	130.0	40	1.01	277
P-61	293	J-57	J-58	4.0	Cast iron	130.0	27	0.69	293
P-62	228	J-58	J-59	2.0	PVC	150.0	-3	0.32	228
P-63	147	J-59	J-35	4.0	Cast iron	130.0	-3	0.08	147
P-64	368	J-36	J-60	4.0	Cast iron	130.0	0	0.00	368
P-65	381	J-37	J-61	10.0	PVC	150.0	48	0.20	381
P-66	13	J-61	J-16	10.0	PVC	150.0	48	0.20	13
P-67	427	J-14	J-62	4.0	PVC	150.0	9	0.22	427
P-68	114	J-62	J-63	4.0	PVC	150.0	6	0.17	114
P-69	157	J-63	J-64	4.0	PVC	150.0	3	0.08	157
P-70	429	J-64	J-15	4.0	PVC	150.0	1	0.02	429

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Length (ft)
P-71	295	J-17	J-65	8.0	PVC	150.0	23	0.15	295
P-72	521	J-65	J-66	8.0	PVC	150.0	23	0.15	521
P-73	327	J-66	J-67	4.0	PVC	150.0	7	0.17	327
P-74	242	J-66	J-68	4.0	PVC	150.0	12	0.31	242
P-75	48	J-68	J-69	4.0	PVC	150.0	12	0.31	48
P-76	300	J-69	J-70	4.0	Cast iron	150.0	5	0.14	300
P-77	138	J-69	J-71	4.0	Cast iron	130.0	1	0.03	138
P-78	136	J-71	J-72	4.0	PVC	150.0	1	0.03	136
P-79	336	J-70	J-73	10.0	PVC	150.0	37	0.15	336
P-80	44	J-73	J-74	6.0	PVC	150.0	11	0.13	44
P-81	323	J-74	J-75	6.0	PVC	150.0	11	0.13	323
P-82	202	J-75	J-76	8.0	PVC	150.0	8	0.05	202
P-83	424	J-76	J-77	8.0	PVC	150.0	4	0.03	424
P-84	185	J-77	J-78	8.0	PVC	150.0	3	0.02	185
P-85	38	J-73	J-79	6.0	PVC	150.0	26	0.29	38
P-87	259	J-80	J-81	6.0	PVC	150.0	12	0.14	259
P-88	400	J-81	J-82	4.0	Cast iron	150.0	7	0.19	400
P-90	376	J-57	J-34	4.0	Cast iron	130.0	3	0.07	376
P-91	33	J-34	J-83	4.0	Cast iron	130.0	18	0.46	33
P-92	339	J-83	J-84	4.0	Cast iron	130.0	18	0.46	339
P-93	24	J-84	J-13	4.0	Cast iron	130.0	18	0.46	24
P-94	16	J-37	J-85	4.0	Cast iron	130.0	14	0.36	16
P-95	358	J-85	J-86	4.0	Cast iron	130.0	14	0.36	358
P-96	458	J-86	J-87	4.0	Cast iron	130.0	7	0.17	458
P-97	46	J-58	J-88	4.0	Cast iron	130.0	21	0.54	46
P-98	257	J-88	J-86	4.0	Cast iron	130.0	21	0.54	257
P-99	270	J-86	J-89	4.0	Cast iron	130.0	20	0.50	270
P-100	290	J-89	J-90	4.0	Cast iron	130.0	30	0.78	290
P-101	418	J-19	J-91	10.0	PVC	150.0	68	0.28	418
P-102	403	J-91	J-70	10.0	PVC	150.0	50	0.20	403
P-103	22	J-90	J-92	4.0	Cast iron	130.0	-31	0.80	22
P-104	57	J-92	J-93	4.0	Cast iron	130.0	-31	0.80	57
P-107	69	J-95	J-96	4.0	Cast iron	130.0	0	0.00	69
P-108	281	J-89	J-97	4.0	Cast iron	130.0	0	0.00	281

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Length (ft)
P-109	14	J-89	J-98	4.0	Cast iron	130.0	-18	0.45	14
P-110	360	J-98	J-38	4.0	Cast iron	130.0	-18	0.45	360
P-111	394	J-38	J-18	8.0	Cast iron	130.0	37	0.24	394
P-113	15	J-99	J-94	4.0	Cast iron	130.0	5	0.13	15
P-115	329	J-100	J-303	4.0	Cast iron	150.0	6	0.14	329
P-116	9	J-100	J-102	4.0	PVC	150.0	4	0.11	9
P-117	259	J-102	J-103	4.0	Cast iron	150.0	4	0.11	259
P-118	373	J-103	J-22	4.0	Cast iron	150.0	-1	0.03	373
P-119	371	J-100	J-20	4.0	PVC	150.0	-4	0.09	371
P-120	14	J-91	J-104	8.0	PVC	150.0	13	0.08	14
P-121	280	J-104	J-105	4.0	Cast iron	150.0	13	0.34	280
P-122	18	J-105	J-106	6.0	PVC	150.0	18	0.20	18
P-123	239	J-106	J-107	6.0	PVC	150.0	18	0.20	239
P-124	380	J-82	J-108	4.0	Cast iron	150.0	1	0.01	380
P-125	422	J-108	J-22	4.0	Cast iron	150.0	-10	0.25	422
P-126	13	J-107	J-108	4.0	Cast iron	150.0	18	0.46	13
P-127	281	J-108	J-109	6.0	PVC	150.0	19	0.22	281
P-128	20	J-109	J-110	6.0	PVC	150.0	19	0.22	20
P-129	425	J-110	J-24	6.0	Cast iron	150.0	1	0.01	425
P-130	298	J-24	J-111	4.0	Cast iron	150.0	0	0.00	298
P-132	153	J-70	J-113	4.0	Cast iron	150.0	10	0.25	153
P-133	137	J-113	J-114	4.0	Cast iron	150.0	10	0.25	137
P-134	285	J-79	J-115	6.0	PVC	150.0	21	0.24	285
P-135	17	J-115	J-80	6.0	PVC	150.0	16	0.19	17
P-136	373	J-114	J-115	4.0	Cast iron	150.0	-4	0.09	373
P-137	140	J-115	J-116	4.0	Cast iron	150.0	1	0.03	140
P-138	406	J-114	J-105	4.0	Cast iron	150.0	4	0.11	406
P-139	419	J-20	J-105	4.0	Cast iron	150.0	9	0.24	419
P-140	385	J-110	J-117	6.0	Cast iron	150.0	10	0.11	385
P-141	34	J-117	J-118	2.0	Cast iron	130.0	6	0.57	34
P-142	320	J-118	J-119	2.0	Cast iron	130.0	6	0.57	320
P-143	341	J-119	J-120	2.0	Cast iron	130.0	1	0.11	341
P-144	358	J-119	J-121	4.0	Ductile Iron	130.0	3	0.09	358
P-145	837	J-119	J-122	2.0	Cast iron	130.0	1	0.11	837

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Length (ft)
P-146	446	J-122	J-123	2.0	Cast iron	130.0	1	0.11	446
P-147	283	J-123	J-124	2.0	Cast iron	130.0	1	0.11	283
P-148	100	J-124	J-125	2.0	Cast iron	130.0	1	0.11	100
P-149	149	J-117	J-126	0.8	PVC	150.0	0	0.13	149
P-150	240	J-39	J-127	6.0	PVC	150.0	0	0.00	240
P-151	28	J-127	J-128	6.0	PVC	150.0	0	0.00	28
P-152	76	J-128	J-129	2.0	Galvanized iron	120.0	0	0.00	76
P-153	120	J-129	J-130	2.0	Galvanized iron	120.0	0	0.00	120
P-154A	344	J-25	J-306	4.0	Cast iron	150.0	6	0.14	344
P-154B	798	J-306	J-131	4.0	Cast iron	150.0	6	0.14	798
P-155	169	J-90	J-132	4.0	Ductile Iron	130.0	55	1.40	169
P-156	435	J-132	J-133	4.0	Ductile Iron	130.0	53	1.34	435
P-157	320	J-133	J-134	4.0	Ductile Iron	130.0	10	0.27	320
P-158	145	J-134	J-135	4.0	Ductile Iron	150.0	-12	0.30	145
P-159	92	J-135	J-136	4.0	Ductile Iron	150.0	-12	0.30	92
P-160	25	J-136	J-137	6.0	PVC	150.0	-13	0.15	25
P-161	229	J-137	J-138	6.0	PVC	150.0	-13	0.15	229
P-162	203	J-138	J-139	6.0	PVC	150.0	-13	0.15	203
P-163	71	J-139	J-133	6.0	PVC	150.0	-16	0.19	71
P-164	296	J-38	J-140	10.0	PVC	150.0	126	0.52	296
P-165	37	J-140	J-39	10.0	PVC	150.0	90	0.37	37
P-166	293	J-140	J-93	4.0	Cast iron	130.0	31	0.80	293
P-167	27	J-140	J-99	4.0	Cast iron	130.0	5	0.13	27
P-168	292	J-18	J-141	8.0	Cast iron	130.0	56	0.36	292
P-169	39	J-141	J-19	8.0	Cast iron	130.0	61	0.39	39
P-170	355	J-141	J-94	4.0	Cast iron	130.0	-5	0.13	355
P-171	541	J-141	J-95	4.0	Cast iron	130.0	0	0.00	541
P-172	28	J-99	J-142	4.0	Cast iron	130.0	0	0.00	28
P-173	295	J-100	J-39	4.0	Cast iron	150.0	-13	0.33	295
P-174	938	J-1	J-143	12.0	Steel	100.0	0	0.00	939
P-175	508	J-143	J-144	12.0	Steel	100.0	0	0.00	505
P-176	861	J-144	J-145	12.0	Steel	100.0	0	0.00	776
P-177	688	J-145	J-146	12.0	Steel	100.0	0	0.00	993
P-178	449	J-146	J-147	12.0	Steel	100.0	0	0.00	1,180

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Length (ft)
P-179	633	J-147	J-148	12.0	Steel	100.0	0	0.00	319
P-180	648	J-148	J-151	12.0	Steel	100.0	0	0.00	686
P-181	1,143	J-151	J-152	12.0	Steel	100.0	0	0.00	880
P-182	1,323	J-152	J-153	12.0	Steel	100.0	0	0.00	404
P-183	197	J-153	J-154	12.0	Steel	100.0	0	0.00	386
P-184	11	R-1	PMP-1	14.0	Ductile Iron	130.0	0	0.00	22
P-185	249	PMP-1	J-154	12.0	Ductile Iron	130.0	0	0.00	1
P-186	184	T-1	J-1	6.0	PVC	150.0	405	4.59	150
P-201	151	J-126	J-82	4.0	Cast iron	150.0	0	0.00	151

FlexTable: Pump Table

Label	Elevation (ft)	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	2,190.00	Off	2,184.00	2,221.40	0	0.00
PMP-2 CIP	2,015.00	Off	(N/A)	(N/A)	(N/A)	(N/A)

FlexTable: Tank Table

ID	Label	Elevation (Base) (ft)	Elevation (Minimum) (ft)	Elevation (Initial) (ft)	Elevation (Maximum) (ft)	Diameter (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)	Is Active?
257	T-1	2,210.00	2,210.00	2,223.00	2,227.25	34.50	405	2,223.00	True
471	T-2 CIP	2,210.00	2,210.00	2,223.00	2,250.00	30.00	(N/A)	(N/A)	False

Appendix C-2

Water Modeling Results for Base Year – Fire Flow Analysis

Fire Flow Node FlexTable: Fire Flow Report

Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Flow (Total Needed) (gpm)	Flow (Total Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual) (psi)	Pressure (Zone Lower Limit) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Junction w/ Minimum Pressure (Zone)	Pipe w/ Maximum Velocity	Velocity of Maximum Pipe (ft/s)
J-23	False	1,500	1,131	1,500	1,131	20	24	20	20	J-125	P-23	16.96
J-32	False	1,500	494	1,500	494	20	20	20	20	J-31	P-30	12.66
J-40	False	1,500	1,421	1,500	1,421	20	27	20	20	J-125	P-186	18.17
J-43	False	1,000	615	1,000	615	20	22	20	20	J-48	P-42	15.87
J-55	False	1,000	461	1,000	461	20	20	20	20	J-54	P-56	11.80
J-61	False	1,500	1,483	1,500	1,483	20	24	20	20	J-125	P-186	18.88
J-63	False	1,000	716	1,002	718	20	20	20	23	J-62	P-15	10.44
J-65	False	1,500	1,447	1,500	1,447	20	23	20	20	J-125	P-186	18.47
J-67	False	1,500	591	1,503	594	20	20	20	37	J-7	P-73	15.16
J-76	False	1,500	1,187	1,502	1,189	20	20	20	20	J-78	P-186	15.53
J-82	False	1,000	984	1,003	987	20	20	20	20	J-126	P-186	13.22
J-87	False	1,000	385	1,003	388	20	20	20	38	J-4	P-96	9.91
J-88	False	1,000	836	1,000	836	20	20	20	22	J-58	P-186	11.54
J-95	False	1,000	445	1,000	445	20	20	20	20	J-96	P-171	11.37
J-97	False	1,000	494	1,000	494	20	20	20	38	J-134	P-108	12.62
J-98	False	1,000	989	1,000	989	20	20	20	21	J-97	P-109	15.38
J-104	False	1,500	1,401	1,500	1,401	20	28	20	20	J-125	P-186	17.95
J-111	False	1,000	628	1,000	628	20	20	20	34	J-125	P-130	16.02
J-116	False	1,000	891	1,001	891	20	20	20	32	J-125	P-137	22.75
J-118	False	1,000	262	1,000	262	20	31	20	20	J-125	P-141	27.06
J-129	False	1,000	183	1,000	183	20	21	20	20	J-130	P-152	18.71
J-131	False	1,000	323	1,003	326	20	20	20	39	J-4	P-24	8.31
J-135	False	1,500	304	1,500	304	20	20	20	20	J-134	P-155	8.40
J-137	False	1,000	309	1,000	309	20	20	20	20	J-134	P-155	8.52
J-21	True	1,000	1,353	1,000	1,353	20	28	20	20	J-125	P-186	17.41
J-33	True	1,000	1,500	1,000	1,500	20	23	20	22	J-48	P-186	19.07
J-53	True	1,000	1,281	1,000	1,281	20	21	20	20	J-54	P-55	32.73
J-78	True	1,000	1,095	1,002	1,097	20	20	20	22	J-77	P-186	14.48
J-80	True	1,000	1,379	1,002	1,381	20	23	20	20	J-125	P-186	17.71
J-83	True	1,000	1,282	1,000	1,282	20	20	20	26	J-48	P-91	26.40
J-84	True	1,000	1,032	1,000	1,032	20	20	20	23	J-13	P-93	16.60
J-85	True	1,000	1,405	1,000	1,405	20	20	20	22	J-87	P-94	30.73
J-102	True	1,000	1,143	1,000	1,143	20	20	20	21	J-100	P-116	21.41
J-106	True	1,000	1,271	1,000	1,271	20	27	20	20	J-125	P-186	16.48
J-107	True	1,000	1,215	1,000	1,215	20	29	20	20	J-125	P-186	15.84
J-109	True	1,000	1,073	1,000	1,073	20	31	20	20	J-125	P-186	14.23
J-113	True	1,000	1,226	1,000	1,226	20	20	20	24	J-125	P-132	17.70
J-127	True	1,000	1,253	1,000	1,253	20	20	20	20	J-130	P-186	16.27

FlexTable: Junction Table

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Unit Demand Collection <Count>	Demand (gpm)
J-1	2,119.00	2,209.74	39	1	0
J-2	2,119.00	2,209.70	39	1	0
J-3	2,117.00	2,209.64	40	1	0
J-4	2,117.00	2,209.59	40	1	0
J-5	2,116.00	2,209.53	40	1	0
J-6	2,116.00	2,209.51	40	1	0
J-7	2,116.00	2,209.51	40	1	1
J-8	2,112.00	2,209.42	42	1	2
J-9	2,112.00	2,209.41	42	1	0
J-10	2,109.00	2,209.35	43	1	5
J-11	2,109.00	2,209.34	43	1	0
J-12	2,106.00	2,209.31	45	1	3
J-13	2,104.00	2,209.29	46	1	2
J-14	2,103.00	2,209.27	46	1	4
J-15	2,101.00	2,209.26	47	1	3
J-16	2,100.00	2,209.26	47	1	0
J-17	2,100.00	2,209.25	47	1	1
J-18	2,097.00	2,209.25	49	1	5
J-19	2,094.00	2,209.24	50	1	2
J-20	2,093.00	2,209.24	50	1	4
J-21	2,089.00	2,209.23	52	1	0
J-22	2,089.00	2,209.23	52	1	5
J-23	2,087.00	2,209.22	53	1	0
J-24	2,087.00	2,209.22	53	1	4
J-25	2,085.00	2,209.22	54	1	0
J-26	2,116.00	2,209.51	40	1	0
J-27	2,116.00	2,209.51	40	1	0
J-28	2,116.00	2,209.51	40	1	0
J-29	2,113.00	2,209.51	42	1	3
J-30	2,110.00	2,209.32	43	1	1
J-31	2,111.00	2,209.32	43	1	2
J-32	2,111.00	2,209.32	43	1	0
J-33	2,109.00	2,209.35	43	1	0
J-34	2,107.00	2,209.32	44	1	4
J-35	2,106.00	2,209.29	45	1	4
J-36	2,106.00	2,209.29	45	1	0
J-37	2,103.00	2,209.26	46	1	4
J-38	2,101.00	2,209.25	47	1	5
J-39	2,098.00	2,209.24	48	1	4
J-40	2,094.00	2,209.24	50	1	0
J-41	2,108.00	2,209.31	44	1	0
J-42	2,108.00	2,209.31	44	1	5
J-43	2,108.00	2,209.31	44	1	0
J-44	2,110.00	2,209.31	43	1	0
J-45	2,109.00	2,209.27	43	1	0
J-46	2,109.00	2,209.27	43	1	0
J-47	2,108.00	2,209.27	44	1	0
J-48	2,113.00	2,209.26	42	1	1

FlexTable: Junction Table

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Unit Demand Collection <Count>	Demand (gpm)
J-49	2,104.00	2,209.25	46	1	1
J-50	2,110.00	2,209.31	43	1	0
J-51	2,112.00	2,209.41	42	1	0
J-52	2,112.00	2,209.41	42	1	0
J-53	2,112.00	2,209.41	42	1	0
J-54	2,114.00	2,209.40	41	1	2
J-55	2,114.00	2,209.40	41	1	0
J-56	2,112.00	2,209.41	42	1	0
J-57	2,110.00	2,209.32	43	1	5
J-58	2,109.00	2,209.28	43	1	4
J-59	2,107.00	2,209.29	44	1	0
J-60	2,102.00	2,209.29	46	1	0
J-61	2,100.00	2,209.26	47	1	0
J-62	2,100.00	2,209.27	47	1	1
J-63	2,099.00	2,209.26	48	1	2
J-64	2,098.00	2,209.26	48	1	1
J-65	2,096.00	2,209.25	49	1	0
J-66	2,093.00	2,209.25	50	1	2
J-67	2,096.00	2,209.24	49	1	3
J-68	2,091.00	2,209.24	51	1	0
J-69	2,091.00	2,209.24	51	1	3
J-70	2,088.00	2,209.24	52	1	4
J-71	2,090.00	2,209.24	52	1	0
J-72	2,088.00	2,209.24	52	1	1
J-73	2,086.00	2,209.24	53	1	0
J-74	2,086.00	2,209.24	53	1	0
J-75	2,084.00	2,209.23	54	1	2
J-76	2,086.00	2,209.23	53	1	2
J-77	2,084.00	2,209.23	54	1	1
J-78	2,086.00	2,209.23	53	1	2
J-79	2,086.00	2,209.23	53	1	2
J-80	2,085.00	2,209.23	54	1	2
J-81	2,083.00	2,209.23	55	1	2
J-82	2,084.00	2,209.23	54	1	3
J-83	2,107.00	2,209.32	44	1	0
J-84	2,104.00	2,209.29	46	1	0
J-85	2,103.00	2,209.26	46	1	0
J-86	2,106.00	2,209.25	45	1	4
J-87	2,109.00	2,209.24	43	1	3
J-88	2,109.00	2,209.27	43	1	0
J-89	2,103.00	2,209.23	46	1	3
J-90	2,100.00	2,209.17	47	1	3
J-91	2,091.00	2,209.24	51	1	2
J-92	2,100.00	2,209.18	47	1	0
J-93	2,099.00	2,209.19	48	1	0
J-94	2,098.00	2,209.24	48	1	0
J-95	2,090.00	2,209.24	52	1	0
J-96	2,090.00	2,209.24	52	1	0

FlexTable: Junction Table

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Unit Demand Collection <Count>	Demand (gpm)
J-97	2,104.00	2,209.23	46	1	0
J-98	2,103.00	2,209.23	46	1	0
J-99	2,098.00	2,209.24	48	1	0
J-100	2,096.00	2,209.24	49	1	3
J-102	2,096.00	2,209.24	49	1	0
J-103	2,091.00	2,209.23	51	1	3
J-104	2,091.00	2,209.24	51	1	0
J-105	2,088.00	2,209.23	52	1	4
J-106	2,088.00	2,209.23	52	1	0
J-107	2,087.00	2,209.23	53	1	0
J-108	2,087.00	2,209.23	53	1	4
J-109	2,084.00	2,209.22	54	1	0
J-110	2,084.00	2,209.22	54	1	4
J-111	2,087.00	2,209.22	53	1	0
J-113	2,087.00	2,209.23	53	1	0
J-114	2,087.00	2,209.23	53	1	4
J-115	2,085.00	2,209.23	54	1	0
J-116	2,083.00	2,209.23	55	1	1
J-117	2,084.00	2,209.22	54	1	2
J-118	2,084.00	2,209.21	54	1	0
J-119	2,085.00	2,209.14	54	1	0
J-120	2,080.00	2,209.13	56	1	1
J-121	2,079.00	2,209.14	56	1	2
J-122	2,077.00	2,209.13	57	1	0
J-123	2,078.00	2,209.12	57	1	0
J-124	2,080.00	2,209.12	56	1	0
J-125	2,110.00	2,209.12	43	1	1
J-126	2,085.00	2,209.23	54	1	0
J-127	2,099.00	2,209.24	48	1	0
J-128	2,099.00	2,209.24	48	1	0
J-129	2,099.00	2,209.24	48	1	0
J-130	2,100.00	2,209.24	47	1	0
J-131	2,087.00	2,209.22	53	1	3
J-132	2,100.00	2,209.08	47	1	1
J-133	2,102.00	2,208.85	46	1	12
J-134	2,107.00	2,208.84	44	1	10
J-135	2,106.00	2,208.85	44	1	0
J-136	2,106.00	2,208.85	44	1	1
J-137	2,106.00	2,208.85	44	1	0
J-138	2,104.00	2,208.85	45	1	0
J-139	2,102.00	2,208.85	46	1	2
J-140	2,098.00	2,209.24	48	1	0
J-141	2,094.00	2,209.24	50	1	0
J-142	2,098.00	2,209.24	48	1	0
J-143	2,121.00	2,209.74	38	1	0
J-144	2,130.00	2,209.74	34	1	0
J-145	2,135.00	2,209.74	32	1	0
J-146	2,146.00	2,209.74	28	1	0

FlexTable: Junction Table

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Unit Demand Collection <Count>	Demand (gpm)
J-147	2,155.00	2,209.74	24	1	0
J-148	2,170.00	2,209.74	17	1	0
J-151	2,181.00	2,209.74	12	1	0
J-152	2,187.00	2,209.74	10	1	0
J-153	2,190.00	2,209.74	9	1	0
J-154	2,190.00	2,209.74	9	1	0
J-303	2,095.00	2,209.23	49	1	3
J-306	2,085.60	2,209.22	53	0	0
J-307	2,101.99	2,209.27	46	1	0

FlexTable: Pump Table

Label	Elevation (ft)	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	2,190.00	Off	2,184.00	2,209.74	0	0.00
PMP-2 CIP	2,015.00	Off	(N/A)	(N/A)	(N/A)	(N/A)

FlexTable: Tank Table

Label	Elevation (Base) (ft)	Elevation (Minimum) (ft)	Elevation (Initial) (ft)	Elevation (Maximum) (ft)	Diameter (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)	Is Active?
T-1	2,210.00	2,210.00	2,210.10	2,227.25	34.50	181	2,210.10	True
T-2 CIP	2,210.00	2,210.00	2,210.10	2,250.00	30.00	(N/A)	(N/A)	False

Appendix C-3

Water Modeling Results for Year 6 – Peak Hourly Demand Analysis

FlexTable: Junction Table

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Unit Demand Collection <Count>	Demand (gpm)
J-1	2,119.00	2,242.49	53	1	0
J-4	2,117.00	2,239.66	53	1	0
J-5	2,116.00	2,239.47	53	1	0
J-6	2,116.00	2,239.43	53	1	0
J-7	2,116.00	2,239.42	53	1	2
J-8	2,112.00	2,239.25	55	1	3
J-9	2,112.00	2,239.24	55	1	0
J-10	2,109.00	2,239.14	56	1	10
J-11	2,109.00	2,239.13	56	1	0
J-12	2,106.00	2,239.08	58	1	7
J-13	2,104.00	2,239.06	58	1	4
J-14	2,103.00	2,239.03	59	1	8
J-15	2,101.00	2,239.01	60	1	7
J-16	2,100.00	2,239.00	60	1	0
J-17	2,100.00	2,238.97	60	1	2
J-18	2,097.00	2,238.97	61	1	10
J-19	2,094.00	2,238.95	63	1	3
J-20	2,093.00	2,238.94	63	1	9
J-21	2,089.00	2,238.93	65	1	0
J-22	2,089.00	2,238.93	65	1	11
J-23	2,087.00	2,238.88	66	1	0
J-24	2,087.00	2,238.87	66	1	9
J-25	2,085.00	2,238.87	67	1	0
J-26	2,116.00	2,239.43	53	1	0
J-27	2,116.00	2,239.43	53	1	0
J-28	2,116.00	2,239.42	53	1	0
J-29	2,113.00	2,239.30	55	1	6
J-30	2,110.00	2,239.11	56	1	2
J-31	2,111.00	2,239.11	55	1	4
J-32	2,111.00	2,239.11	55	1	0
J-33	2,109.00	2,239.14	56	1	0
J-34	2,107.00	2,239.09	57	1	9
J-35	2,106.00	2,239.04	58	1	9
J-36	2,106.00	2,239.04	58	1	0
J-37	2,103.00	2,239.00	59	1	8
J-38	2,101.00	2,238.98	60	1	10
J-39	2,098.00	2,238.97	61	1	9
J-40	2,094.00	2,238.95	63	1	0
J-41	2,108.00	2,239.09	57	1	0
J-42	2,108.00	2,239.09	57	1	10
J-43	2,108.00	2,239.09	57	1	0
J-44	2,110.00	2,239.11	56	1	0
J-45	2,109.00	2,238.94	56	1	0
J-46	2,109.00	2,238.93	56	1	0
J-47	2,108.00	2,238.93	57	1	0
J-48	2,113.00	2,238.92	54	1	1
J-49	2,104.00	2,238.86	58	1	2
J-50	2,110.00	2,239.11	56	1	0

FlexTable: Junction Table

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Unit Demand Collection <Count>	Demand (gpm)
J-51	2,112.00	2,239.24	55	1	0
J-52	2,112.00	2,239.22	55	1	0
J-53	2,112.00	2,239.21	55	1	0
J-54	2,114.00	2,239.11	54	1	3
J-55	2,114.00	2,239.11	54	1	0
J-56	2,112.00	2,239.22	55	1	0
J-57	2,110.00	2,239.09	56	1	10
J-58	2,109.00	2,239.06	56	1	9
J-59	2,107.00	2,239.04	57	1	0
J-61	2,100.00	2,239.00	60	1	0
J-62	2,100.00	2,239.01	60	1	2
J-63	2,099.00	2,239.01	61	1	3
J-64	2,098.00	2,239.01	61	1	2
J-65	2,096.00	2,238.96	62	1	0
J-66	2,093.00	2,238.96	63	1	4
J-67	2,096.00	2,238.94	62	1	7
J-68	2,091.00	2,238.94	64	1	0
J-69	2,091.00	2,238.93	64	1	6
J-70	2,088.00	2,238.93	65	1	9
J-71	2,090.00	2,238.93	64	1	0
J-72	2,088.00	2,238.93	65	1	1
J-73	2,086.00	2,238.92	66	1	0
J-74	2,086.00	2,238.92	66	1	0
J-75	2,084.00	2,238.92	67	1	3
J-76	2,086.00	2,238.92	66	1	3
J-77	2,084.00	2,238.92	67	1	1
J-78	2,086.00	2,238.92	66	1	3
J-79	2,086.00	2,238.92	66	1	4
J-80	2,085.00	2,238.91	67	1	4
J-81	2,083.00	2,238.90	67	1	4
J-82	2,084.00	2,238.88	67	1	7
J-83	2,107.00	2,239.08	57	1	0
J-84	2,104.00	2,239.06	58	1	0
J-85	2,103.00	2,239.01	59	1	0
J-86	2,106.00	2,239.06	58	1	9
J-87	2,109.00	2,239.25	56	1	7
J-88	2,109.00	2,239.06	56	1	0
J-89	2,103.00	2,239.06	59	1	7
J-90	2,100.00	2,239.05	60	1	7
J-91	2,091.00	2,238.94	64	1	4
J-92	2,100.00	2,239.05	60	1	0
J-93	2,099.00	2,239.04	61	1	0
J-94	2,098.00	2,238.97	61	1	0
J-95	2,090.00	2,238.95	64	1	0
J-96	2,090.00	2,238.95	64	1	0
J-97	2,104.00	2,239.24	59	1	0
J-98	2,103.00	2,239.06	59	1	0
J-99	2,098.00	2,238.97	61	1	0

FlexTable: Junction Table

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Unit Demand Collection <Count>	Demand (gpm)
J-100	2,096.00	2,238.96	62	1	7
J-102	2,096.00	2,238.96	62	1	0
J-103	2,091.00	2,238.94	64	1	6
J-104	2,091.00	2,238.94	64	1	0
J-105	2,088.00	2,238.90	65	1	9
J-106	2,088.00	2,238.90	65	1	0
J-107	2,087.00	2,238.89	66	1	0
J-108	2,087.00	2,238.88	66	1	9
J-109	2,084.00	2,238.87	67	1	0
J-110	2,084.00	2,238.87	67	1	9
J-111	2,087.00	2,238.86	66	1	0
J-113	2,087.00	2,238.92	66	1	0
J-114	2,087.00	2,238.90	66	1	9
J-115	2,085.00	2,238.91	67	1	0
J-116	2,083.00	2,238.91	67	1	1
J-117	2,084.00	2,238.87	67	1	4
J-118	2,084.00	2,238.84	67	1	0
J-119	2,085.00	2,238.50	66	1	0
J-120	2,080.00	2,238.48	69	1	1
J-121	2,079.00	2,238.50	69	1	3
J-122	2,077.00	2,238.46	70	1	0
J-123	2,078.00	2,238.43	69	1	0
J-124	2,080.00	2,238.42	69	1	0
J-125	2,110.00	2,238.41	56	1	1
J-127	2,099.00	2,238.97	61	1	0
J-128	2,099.00	2,238.97	61	1	0
J-129	2,099.00	2,238.97	61	1	0
J-130	2,100.00	2,238.97	60	1	0
J-131	2,087.00	2,238.84	66	1	6
J-132	2,100.00	2,239.32	60	1	2
J-133	2,102.00	2,240.06	60	1	26
J-134	2,107.00	2,240.18	58	1	22
J-135	2,106.00	2,240.36	58	1	0
J-136	2,106.00	2,240.19	58	1	1
J-137	2,106.00	2,240.18	58	1	0
J-138	2,104.00	2,240.12	59	1	0
J-139	2,102.00	2,240.07	60	1	3
J-140	2,098.00	2,238.97	61	1	0
J-141	2,094.00	2,238.95	63	1	0
J-142	2,098.00	2,238.97	61	1	0
J-300	2,115.00	2,240.99	55	0	0
J-301	2,110.00	2,240.41	56	0	0
J-303	2,095.00	2,239.05	62	1	6
J-304	2,091.00	2,238.94	64	1	0
J-305	2,087.00	2,238.86	66	1	7
J-306	2,085.60	2,238.86	66	0	0
J-307	2,101.99	2,239.03	59	1	0

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Length (ft)
P-4	346	J-4	J-5	10.0	PVC	150.0	313	1.28	346
P-5	77	J-5	J-6	10.0	PVC	150.0	313	1.28	77
P-6	16	J-6	J-7	10.0	PVC	150.0	253	1.03	16
P-7	472	J-7	J-8	10.0	PVC	150.0	251	1.03	472
P-8	20	J-8	J-9	10.0	PVC	150.0	248	1.01	20
P-10	25	J-10	J-11	4.0	Cast iron	130.0	21	0.53	25
P-11	370	J-11	J-12	4.0	Cast iron	130.0	11	0.29	370
P-12	286	J-12	J-13	4.0	Cast iron	130.0	9	0.23	286
P-13	156	J-13	J-14	4.0	PVC	150.0	13	0.34	156
P-14A	134	J-307	J-15	4.0	PVC	150.0	15	0.39	134
P-14B	136	J-14	J-307	4.0	PVC	150.0	-2	0.05	136
P-15	174	J-15	J-16	4.0	PVC	150.0	8	0.21	174
P-16	35	J-16	J-17	4.0	PVC	150.0	38	0.97	35
P-17	236	J-17	J-18	10.0	PVC	150.0	14	0.06	236
P-19	294	J-19	J-20	8.0	Cast iron	150.0	46	0.29	294
P-20	258	J-20	J-21	8.0	Cast iron	150.0	34	0.22	258
P-21	11	J-21	J-22	8.0	Cast iron	150.0	34	0.22	11
P-22	285	J-22	J-23	4.0	Cast iron	150.0	16	0.40	285
P-23	17	J-23	J-24	4.0	Cast iron	150.0	16	0.40	17
P-24	174	J-24	J-25	4.0	Cast iron	150.0	5	0.13	174
P-25	13	J-6	J-26	8.0	PVC	150.0	59	0.38	13
P-26	10	J-26	J-27	8.0	PVC	150.0	59	0.38	10
P-27	20	J-27	J-28	8.0	PVC	150.0	59	0.38	20
P-28	407	J-28	J-29	6.0	PVC	150.0	59	0.67	407
P-29	300	J-11	J-30	4.0	PVC	150.0	9	0.24	300
P-30	232	J-30	J-31	4.0	PVC	150.0	-1	0.02	232
P-31	10	J-31	J-32	4.0	PVC	150.0	0	0.00	10
P-32	14	J-10	J-33	10.0	PVC	150.0	176	0.72	14
P-33	275	J-33	J-34	10.0	PVC	150.0	176	0.72	275
P-34	296	J-34	J-35	10.0	PVC	150.0	161	0.66	296
P-35	9	J-35	J-36	10.0	PVC	150.0	136	0.56	9
P-36	294	J-36	J-37	10.0	PVC	150.0	136	0.56	294
P-37	269	J-37	J-38	10.0	PVC	150.0	111	0.45	269

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Length (ft)
P-39	387	J-39	J-40	10.0	PVC	150.0	74	0.30	387
P-40	10	J-40	J-19	8.0	Cast iron	150.0	74	0.47	10
P-41	366	J-30	J-41	4.0	PVC	150.0	8	0.21	366
P-42	4	J-41	J-42	4.0	PVC	150.0	4	0.09	4
P-43	48	J-42	J-43	4.0	PVC	150.0	-6	0.16	48
P-44	488	J-43	J-44	4.0	PVC	150.0	-6	0.16	488
P-45	548	J-44	J-45	2.0	PVC	150.0	3	0.34	548
P-46	120	J-45	J-46	2.0	PVC	150.0	1	0.11	120
P-47	428	J-46	J-47	2.0	PVC	150.0	0	0.00	428
P-48	204	J-46	J-48	2.0	PVC	150.0	1	0.11	204
P-49	488	J-45	J-49	2.0	PVC	150.0	2	0.23	488
P-50	21	J-44	J-50	4.0	PVC	150.0	0	0.00	21
P-51	300	J-12	J-41	4.0	Cast iron	130.0	-5	0.12	300
P-52	12	J-9	J-51	10.0	PVC	150.0	248	1.01	12
P-53	377	J-51	J-10	10.0	PVC	150.0	207	0.85	377
P-55	9	J-52	J-53	4.0	Cast iron	130.0	19	0.47	9
P-56	306	J-53	J-54	4.0	Cast iron	130.0	19	0.47	306
P-57	7	J-54	J-55	4.0	Cast iron	130.0	0	0.00	7
P-58	11	J-51	J-56	4.0	Cast iron	130.0	41	1.04	11
P-59	3	J-56	J-52	4.0	Cast iron	130.0	41	1.04	3
P-60	277	J-52	J-57	4.0	Cast iron	130.0	22	0.57	277
P-61	293	J-57	J-58	4.0	Cast iron	130.0	10	0.25	293
P-62	228	J-58	J-59	2.0	PVC	150.0	2	0.17	228
P-63	147	J-59	J-35	4.0	Cast iron	130.0	2	0.04	147
P-65	381	J-37	J-61	10.0	PVC	150.0	30	0.12	381
P-66	13	J-61	J-16	10.0	PVC	150.0	30	0.12	13
P-67	427	J-14	J-62	4.0	PVC	150.0	7	0.19	427
P-68	114	J-62	J-63	4.0	PVC	150.0	5	0.13	114
P-69	157	J-63	J-64	4.0	PVC	150.0	2	0.05	157
P-70	429	J-64	J-15	4.0	PVC	150.0	0	0.01	429
P-71	295	J-17	J-65	8.0	PVC	150.0	22	0.14	295
P-72	521	J-65	J-66	8.0	PVC	150.0	22	0.14	521
P-73	327	J-66	J-67	4.0	PVC	150.0	7	0.17	327
P-74	242	J-66	J-68	4.0	PVC	150.0	10	0.27	242

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Length (ft)
P-75	48	J-68	J-69	4.0	PVC	150.0	10	0.27	48
P-76	300	J-69	J-70	4.0	Cast iron	150.0	4	0.10	300
P-77	138	J-69	J-71	4.0	Cast iron	130.0	1	0.03	138
P-78	136	J-71	J-72	4.0	PVC	150.0	1	0.03	136
P-79	336	J-70	J-73	10.0	PVC	150.0	38	0.15	336
P-80	44	J-73	J-74	6.0	PVC	150.0	11	0.13	44
P-81	323	J-74	J-75	6.0	PVC	150.0	11	0.13	323
P-82	202	J-75	J-76	8.0	PVC	150.0	8	0.05	202
P-83	424	J-76	J-77	8.0	PVC	150.0	4	0.03	424
P-84	185	J-77	J-78	8.0	PVC	150.0	3	0.02	185
P-85	38	J-73	J-79	6.0	PVC	150.0	27	0.30	38
P-87	259	J-80	J-81	6.0	PVC	150.0	13	0.15	259
P-88	400	J-81	J-82	4.0	Cast iron	150.0	9	0.23	400
P-90	376	J-57	J-34	4.0	Cast iron	130.0	2	0.06	376
P-91	33	J-34	J-83	4.0	Cast iron	130.0	8	0.22	33
P-92	339	J-83	J-84	4.0	Cast iron	130.0	8	0.22	339
P-93	24	J-84	J-13	4.0	Cast iron	130.0	8	0.22	24
P-94	16	J-37	J-85	4.0	Cast iron	130.0	-12	0.31	16
P-95	358	J-85	J-86	4.0	Cast iron	130.0	-12	0.31	358
P-96	458	J-86	J-87	4.0	Cast iron	130.0	-21	0.53	458
P-97	46	J-58	J-88	4.0	Cast iron	130.0	-1	0.02	46
P-98	257	J-88	J-86	4.0	Cast iron	130.0	-1	0.02	257
P-99	270	J-86	J-89	4.0	Cast iron	130.0	-1	0.03	270
P-100	290	J-89	J-90	4.0	Cast iron	130.0	4	0.10	290
P-101	418	J-19	J-91	10.0	PVC	150.0	71	0.29	418
P-102	403	J-91	J-70	10.0	PVC	150.0	53	0.22	403
P-103	22	J-90	J-92	4.0	Cast iron	130.0	15	0.39	22
P-104	57	J-92	J-93	4.0	Cast iron	130.0	15	0.39	57
P-107	69	J-95	J-96	4.0	Cast iron	130.0	0	0.00	69
P-108	281	J-89	J-97	4.0	Cast iron	130.0	-26	0.67	281
P-109	14	J-89	J-98	4.0	Cast iron	130.0	14	0.37	14
P-110	360	J-98	J-38	4.0	Cast iron	130.0	14	0.37	360
P-111	394	J-38	J-18	8.0	Cast iron	130.0	36	0.23	394
P-113	15	J-99	J-94	4.0	Cast iron	130.0	6	0.15	15

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Length (ft)
P-115	329	J-100	J-303	4.0	Cast iron	150.0	-19	0.49	329
P-116	9	J-100	J-102	4.0	PVC	150.0	10	0.26	9
P-117	259	J-102	J-103	4.0	Cast iron	150.0	10	0.26	259
P-118	373	J-103	J-22	4.0	Cast iron	150.0	4	0.11	373
P-119	371	J-100	J-20	4.0	PVC	150.0	8	0.21	371
P-120	14	J-91	J-104	8.0	PVC	150.0	13	0.09	14
P-121	280	J-104	J-105	4.0	Cast iron	150.0	13	0.34	280
P-122	18	J-105	J-106	6.0	PVC	150.0	19	0.22	18
P-123	239	J-106	J-107	6.0	PVC	150.0	19	0.22	239
P-124	380	J-82	J-108	4.0	Cast iron	150.0	-5	0.12	380
P-125	422	J-108	J-22	4.0	Cast iron	150.0	-12	0.30	422
P-126	13	J-107	J-108	4.0	Cast iron	150.0	19	0.50	13
P-127	281	J-108	J-109	6.0	PVC	150.0	18	0.20	281
P-128	20	J-109	J-110	6.0	PVC	150.0	18	0.20	20
P-129	425	J-110	J-24	6.0	Cast iron	150.0	5	0.06	425
P-130	298	J-24	J-111	4.0	Cast iron	150.0	7	0.18	298
P-132	153	J-70	J-113	4.0	Cast iron	150.0	10	0.26	153
P-133	137	J-113	J-114	4.0	Cast iron	150.0	10	0.26	137
P-134	285	J-79	J-115	6.0	PVC	150.0	22	0.25	285
P-135	17	J-115	J-80	6.0	PVC	150.0	18	0.20	17
P-136	373	J-114	J-115	4.0	Cast iron	150.0	-3	0.08	373
P-137	140	J-115	J-116	4.0	Cast iron	150.0	1	0.03	140
P-138	406	J-114	J-105	4.0	Cast iron	150.0	4	0.11	406
P-139	419	J-20	J-105	4.0	Cast iron	150.0	11	0.28	419
P-140	385	J-110	J-117	6.0	Cast iron	150.0	3	0.04	385
P-141	34	J-117	J-118	2.0	Cast iron	130.0	6	0.57	34
P-142	320	J-118	J-119	2.0	Cast iron	130.0	6	0.57	320
P-143	341	J-119	J-120	2.0	Cast iron	130.0	1	0.11	341
P-144	358	J-119	J-121	4.0	Ductile Iron	130.0	3	0.09	358
P-145	837	J-119	J-122	2.0	Cast iron	130.0	1	0.11	837
P-146	446	J-122	J-123	2.0	Cast iron	130.0	1	0.11	446
P-147	283	J-123	J-124	2.0	Cast iron	130.0	1	0.11	283
P-148	100	J-124	J-125	2.0	Cast iron	130.0	1	0.11	100
P-150	240	J-39	J-127	6.0	PVC	150.0	0	0.00	240

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Length (ft)
P-151	28	J-127	J-128	6.0	PVC	150.0	0	0.00	28
P-152	76	J-128	J-129	2.0	Galvanized iron	120.0	0	0.00	76
P-153	120	J-129	J-130	2.0	Galvanized iron	120.0	0	0.00	120
P-154A	344	J-25	J-306	4.0	Cast iron	150.0	5	0.13	344
P-154B	798	J-306	J-131	4.0	Cast iron	150.0	6	0.14	798
P-155	169	J-90	J-132	4.0	Ductile Iron	130.0	-43	1.09	169
P-156	435	J-132	J-133	4.0	Ductile Iron	130.0	-45	1.14	435
P-157	320	J-133	J-134	4.0	Ductile Iron	130.0	-21	0.52	320
P-158	145	J-134	J-135	4.0	Ductile Iron	150.0	-43	1.09	145
P-159	92	J-135	J-136	4.0	Ductile Iron	150.0	54	1.39	92
P-160	25	J-136	J-137	6.0	PVC	150.0	53	0.61	25
P-161	229	J-137	J-138	6.0	PVC	150.0	53	0.61	229
P-162	203	J-138	J-139	6.0	PVC	150.0	53	0.61	203
P-163	71	J-139	J-133	6.0	PVC	150.0	50	0.57	71
P-164	296	J-38	J-140	10.0	PVC	150.0	80	0.33	296
P-165	37	J-140	J-39	10.0	PVC	150.0	89	0.36	37
P-166	293	J-140	J-93	4.0	Cast iron	130.0	-15	0.39	293
P-167	27	J-140	J-99	4.0	Cast iron	130.0	6	0.15	27
P-168	292	J-18	J-141	8.0	Cast iron	130.0	40	0.25	292
P-169	39	J-141	J-19	8.0	Cast iron	130.0	46	0.29	39
P-170	355	J-141	J-94	4.0	Cast iron	130.0	-6	0.15	355
P-171	541	J-141	J-95	4.0	Cast iron	130.0	0	0.00	541
P-172	28	J-99	J-142	4.0	Cast iron	130.0	0	0.00	28
P-173	295	J-100	J-39	4.0	Cast iron	150.0	-6	0.15	295
P-186	184	T-1	J-1	6.0	PVC	150.0	0	0.00	150
P-300	1,265	J-1	J-300	10.0	PVC CIP	130.0	410	1.67	1,265
P-301	36	J-4	PMP-2 CIP	8.0	PVC CIP	130.0	0	0.00	36
P-302	362	J-304	J-305	8.0	PVC CIP	150.0	0	0.00	362
P-303	311	J-304	J-303	8.0	PVC CIP	150.0	0	0.00	311
P-304	164	J-304	J-103	8.0	PVC CIP	150.0	0	0.00	164
P-305	49	J-111	J-305	8.0	PVC CIP	150.0	7	0.04	49
P-306	1,045	J-301	J-4	10.0	PVC CIP	130.0	313	1.28	1,045
P-308	495	J-300	J-301	10.0	PVC CIP	130.0	410	1.67	495
P-309	203	J-301	J-135	8.0	PVC CIP	130.0	97	0.62	203

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Length (ft)
P-310	362	J-303	J-90	8.0	PVC CIP	130.0	-25	0.16	362
P-311	345	J-117	J-82	6.0	PVC CIP	130.0	-7	0.08	345
P-312	169	J-305	J-306	8.0	PVC CIP	130.0	0	0.00	169
P-313	483	J-31	J-44	8.0	PVC CIP	130.0	10	0.06	483
P-314	191	T-2 CIP	J-1	8.0	PVC CIP	150.0	410	2.62	191
P-315	24	PMP-2 CIP	R-2 CIP	8.0	PVC CIP	130.0	0	0.00	24
P-319	663	J-87	J-29	8.0	PVC CIP	130.0	-54	0.34	663
P-320	324	J-97	J-87	8.0	PVC CIP	130.0	-26	0.17	324
P-322	397	J-307	J-35	8.0	PVC CIP	130.0	-18	0.11	397
P-323	463	J-54	J-31	8.0	PVC CIP	130.0	15	0.10	463

FlexTable: Pump Table

Label	Elevation (ft)	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	2,190.00	Off	(N/A)	(N/A)	(N/A)	(N/A)
PMP-2 CIP	2,015.00	Off	2,239.66	2,100.00	0	0.00

FlexTable: Tank Table

ID	Label	Elevation (Base) (ft)	Elevation (Minimum) (ft)	Elevation (Initial) (ft)	Elevation (Maximum) (ft)	Diameter (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)	Is Active?
257	T-1	2,210.00	2,210.00	2,227.25	2,227.25	34.50	0	2,227.25	True
471	T-2 CIP	2,210.00	2,210.00	2,243.00	2,250.00	30.00	410	2,243.00	True

Appendix C-4

Water Modeling Results for Year 6 – Fire Flow Analysis

Fire Flow Node FlexTable: Fire Flow Report

Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Flow (Total Needed) (gpm)	Flow (Total Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual) (psi)	Pressure (Zone Lower Limit) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Junction w/ Minimum Pressure (Zone)	Pipe w/ Maximum Velocity	Velocity of Maximum Pipe (ft/s)
J-32	False	1,500	1,011	1,500	1,011	20	20	20	21	J-48	P-31	25.81
J-43	False	1,000	971	1,000	971	20	20	20	24	J-42	P-42	16.75
J-55	False	1,000	978	1,000	978	20	20	20	22	J-54	P-57	24.97
J-63	False	1,000	878	1,002	880	20	20	20	24	J-62	P-67	11.43
J-67	False	1,500	658	1,503	661	20	20	20	41	J-7	P-73	16.88
J-76	False	1,500	1,308	1,502	1,310	20	20	20	20	J-78	P-81	14.90
J-88	False	1,000	973	1,000	973	20	20	20	23	J-58	P-97	12.44
J-95	False	1,000	492	1,000	492	20	20	20	20	J-96	P-171	12.56
J-116	False	1,000	982	1,001	983	20	20	20	36	J-125	P-137	25.09
J-118	False	1,000	307	1,000	307	20	31	20	20	J-125	P-141	31.62
J-129	False	1,000	205	1,000	205	20	21	20	20	J-130	P-152	20.96
J-131	False	1,000	463	1,003	466	20	20	20	43	J-4	P-154B	11.90
J-21	True	1,000	1,500	1,000	1,500	20	30	20	23	J-125	P-314	7.00
J-23	True	1,500	1,523	1,500	1,523	20	22	20	20	J-125	P-23	28.16
J-33	True	1,000	1,500	1,000	1,500	20	27	20	25	J-54	P-314	7.00
J-40	True	1,500	1,630	1,500	1,630	20	27	20	20	J-125	P-16	7.73
J-53	True	1,000	1,469	1,000	1,469	20	20	20	23	J-52	P-55	31.97
J-61	True	1,500	1,670	1,500	1,670	20	23	20	20	J-125	P-16	8.76
J-65	True	1,500	1,651	1,500	1,651	20	21	20	20	J-125	P-16	12.45
J-78	True	1,000	1,207	1,002	1,208	20	20	20	22	J-77	P-81	13.75
J-80	True	1,000	1,500	1,002	1,502	20	25	20	22	J-125	P-135	13.76
J-82	True	1,000	1,338	1,003	1,341	20	26	20	20	J-125	P-126	10.00
J-83	True	1,000	1,406	1,000	1,406	20	20	20	27	J-55	P-91	28.71
J-84	True	1,000	1,211	1,000	1,211	20	20	20	24	J-13	P-93	20.76
J-85	True	1,000	1,500	1,000	1,500	20	22	20	25	J-125	P-94	32.17
J-87	True	1,000	1,401	1,003	1,404	20	20	20	22	J-29	P-28	9.54
J-97	True	1,000	1,404	1,000	1,404	20	20	20	21	J-87	P-28	9.24
J-98	True	1,000	1,356	1,000	1,356	20	20	20	23	J-89	P-109	25.40
J-102	True	1,000	1,481	1,000	1,481	20	20	20	22	J-100	P-116	27.06
J-104	True	1,500	1,615	1,500	1,615	20	27	20	20	J-125	P-120	9.56
J-106	True	1,000	1,500	1,000	1,500	20	26	20	21	J-125	P-126	16.44
J-107	True	1,000	1,487	1,000	1,487	20	27	20	20	J-125	P-126	21.06
J-109	True	1,000	1,420	1,000	1,420	20	30	20	20	J-125	P-126	11.92
J-111	True	1,000	1,500	1,000	1,500	20	28	20	23	J-125	P-305	7.90
J-113	True	1,000	1,353	1,000	1,353	20	20	20	27	J-125	P-132	19.49
J-127	True	1,000	1,402	1,000	1,402	20	20	20	20	J-130	P-150	15.91
J-135	True	1,500	2,000	1,500	2,000	20	24	20	24	J-134	P-309	11.97
J-137	True	1,000	1,498	1,000	1,498	20	20	20	21	J-136	P-159	24.10

FlexTable: Junction Table

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Unit Demand Collection <Count>	Demand (gpm)
J-1	2,119.00	2,224.60	46	1	0
J-4	2,117.00	2,223.96	46	1	0
J-5	2,116.00	2,223.91	47	1	0
J-6	2,116.00	2,223.91	47	1	0
J-7	2,116.00	2,223.90	47	1	1
J-8	2,112.00	2,223.87	48	1	2
J-9	2,112.00	2,223.86	48	1	0
J-10	2,109.00	2,223.84	50	1	5
J-11	2,109.00	2,223.84	50	1	0
J-12	2,106.00	2,223.83	51	1	3
J-13	2,104.00	2,223.82	52	1	2
J-14	2,103.00	2,223.82	52	1	4
J-15	2,101.00	2,223.81	53	1	3
J-16	2,100.00	2,223.81	54	1	0
J-17	2,100.00	2,223.80	54	1	1
J-18	2,097.00	2,223.80	55	1	5
J-19	2,094.00	2,223.80	56	1	2
J-20	2,093.00	2,223.80	57	1	4
J-21	2,089.00	2,223.80	58	1	0
J-22	2,089.00	2,223.80	58	1	5
J-23	2,087.00	2,223.79	59	1	0
J-24	2,087.00	2,223.79	59	1	4
J-25	2,085.00	2,223.80	60	1	0
J-26	2,116.00	2,223.90	47	1	0
J-27	2,116.00	2,223.90	47	1	0
J-28	2,116.00	2,223.90	47	1	0
J-29	2,113.00	2,223.88	48	1	3
J-30	2,110.00	2,223.83	49	1	1
J-31	2,111.00	2,223.83	49	1	2
J-32	2,111.00	2,223.83	49	1	0
J-33	2,109.00	2,223.84	50	1	0
J-34	2,107.00	2,223.83	51	1	4
J-35	2,106.00	2,223.82	51	1	4
J-36	2,106.00	2,223.82	51	1	0
J-37	2,103.00	2,223.81	52	1	4
J-38	2,101.00	2,223.81	53	1	5
J-39	2,098.00	2,223.80	54	1	4
J-40	2,094.00	2,223.80	56	1	0
J-41	2,108.00	2,223.83	50	1	0
J-42	2,108.00	2,223.83	50	1	5
J-43	2,108.00	2,223.83	50	1	0
J-44	2,110.00	2,223.83	49	1	0
J-45	2,109.00	2,223.79	50	1	0
J-46	2,109.00	2,223.79	50	1	0
J-47	2,108.00	2,223.79	50	1	0
J-48	2,113.00	2,223.79	48	1	1
J-49	2,104.00	2,223.78	52	1	1
J-50	2,110.00	2,223.83	49	1	0

FlexTable: Junction Table

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Unit Demand Collection <Count>	Demand (gpm)
J-51	2,112.00	2,223.86	48	1	0
J-52	2,112.00	2,223.86	48	1	0
J-53	2,112.00	2,223.86	48	1	0
J-54	2,114.00	2,223.83	48	1	2
J-55	2,114.00	2,223.83	48	1	0
J-56	2,112.00	2,223.86	48	1	0
J-57	2,110.00	2,223.83	49	1	5
J-58	2,109.00	2,223.82	50	1	4
J-59	2,107.00	2,223.82	51	1	0
J-61	2,100.00	2,223.81	54	1	0
J-62	2,100.00	2,223.81	54	1	1
J-63	2,099.00	2,223.81	54	1	2
J-64	2,098.00	2,223.81	54	1	1
J-65	2,096.00	2,223.80	55	1	0
J-66	2,093.00	2,223.80	57	1	2
J-67	2,096.00	2,223.80	55	1	3
J-68	2,091.00	2,223.80	57	1	0
J-69	2,091.00	2,223.80	57	1	3
J-70	2,088.00	2,223.80	59	1	4
J-71	2,090.00	2,223.80	58	1	0
J-72	2,088.00	2,223.80	59	1	1
J-73	2,086.00	2,223.80	60	1	0
J-74	2,086.00	2,223.80	60	1	0
J-75	2,084.00	2,223.80	60	1	2
J-76	2,086.00	2,223.80	60	1	2
J-77	2,084.00	2,223.80	60	1	1
J-78	2,086.00	2,223.80	60	1	2
J-79	2,086.00	2,223.80	60	1	2
J-80	2,085.00	2,223.79	60	1	2
J-81	2,083.00	2,223.79	61	1	2
J-82	2,084.00	2,223.79	60	1	3
J-83	2,107.00	2,223.83	51	1	0
J-84	2,104.00	2,223.82	52	1	0
J-85	2,103.00	2,223.81	52	1	0
J-86	2,106.00	2,223.82	51	1	4
J-87	2,109.00	2,223.86	50	1	3
J-88	2,109.00	2,223.82	50	1	0
J-89	2,103.00	2,223.82	52	1	3
J-90	2,100.00	2,223.81	54	1	3
J-91	2,091.00	2,223.80	57	1	2
J-92	2,100.00	2,223.81	54	1	0
J-93	2,099.00	2,223.81	54	1	0
J-94	2,098.00	2,223.80	54	1	0
J-95	2,090.00	2,223.80	58	1	0
J-96	2,090.00	2,223.80	58	1	0
J-97	2,104.00	2,223.86	52	1	0
J-98	2,103.00	2,223.82	52	1	0
J-99	2,098.00	2,223.80	54	1	0

FlexTable: Junction Table

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Unit Demand Collection <Count>	Demand (gpm)
J-100	2,096.00	2,223.80	55	1	3
J-102	2,096.00	2,223.80	55	1	0
J-103	2,091.00	2,223.80	57	1	3
J-104	2,091.00	2,223.80	57	1	0
J-105	2,088.00	2,223.79	59	1	4
J-106	2,088.00	2,223.79	59	1	0
J-107	2,087.00	2,223.79	59	1	0
J-108	2,087.00	2,223.79	59	1	4
J-109	2,084.00	2,223.79	60	1	0
J-110	2,084.00	2,223.79	60	1	4
J-111	2,087.00	2,223.80	59	1	0
J-113	2,087.00	2,223.80	59	1	0
J-114	2,087.00	2,223.79	59	1	4
J-115	2,085.00	2,223.79	60	1	0
J-116	2,083.00	2,223.79	61	1	1
J-117	2,084.00	2,223.79	60	1	2
J-118	2,084.00	2,223.78	60	1	0
J-119	2,085.00	2,223.71	60	1	0
J-120	2,080.00	2,223.70	62	1	1
J-121	2,079.00	2,223.71	63	1	2
J-122	2,077.00	2,223.70	63	1	0
J-123	2,078.00	2,223.69	63	1	0
J-124	2,080.00	2,223.69	62	1	0
J-125	2,110.00	2,223.69	49	1	1
J-127	2,099.00	2,223.80	54	1	0
J-128	2,099.00	2,223.80	54	1	0
J-129	2,099.00	2,223.80	54	1	0
J-130	2,100.00	2,223.80	54	1	0
J-131	2,087.00	2,223.79	59	1	3
J-132	2,100.00	2,223.87	54	1	1
J-133	2,102.00	2,224.04	53	1	12
J-134	2,107.00	2,224.07	51	1	10
J-135	2,106.00	2,224.11	51	1	0
J-136	2,106.00	2,224.07	51	1	1
J-137	2,106.00	2,224.07	51	1	0
J-138	2,104.00	2,224.06	52	1	0
J-139	2,102.00	2,224.05	53	1	2
J-140	2,098.00	2,223.80	54	1	0
J-141	2,094.00	2,223.80	56	1	0
J-142	2,098.00	2,223.80	54	1	0
J-300	2,115.00	2,224.26	47	0	0
J-301	2,110.00	2,224.13	49	0	0
J-303	2,095.00	2,223.80	56	1	3
J-304	2,091.00	2,223.80	57	1	0
J-305	2,087.00	2,223.80	59	1	3
J-306	2,085.60	2,223.80	60	0	0
J-307	2,101.99	2,223.82	53	1	0

FlexTable: Pump Table

Label	Elevation (ft)	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	2,190.00	Off	(N/A)	(N/A)	(N/A)	(N/A)
PMP-2 CIP	2,015.00	Off	2,223.96	2,100.00	0	0.00

FlexTable: Tank Table

Label	Elevation (Base) (ft)	Elevation (Minimum) (ft)	Elevation (Initial) (ft)	Elevation (Maximum) (ft)	Diameter (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)	Is Active?
T-1	2,210.00	2,210.00	2,224.65	2,227.25	34.50	64	2,224.65	True
T-2 CIP	2,210.00	2,210.00	2,224.65	2,250.00	30.00	120	2,224.65	True

Appendix C-5

Water Modeling Results for Year 20 – Peak Hourly Demand Analysis

FlexTable: Junction Table

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Unit Demand Collection <Count>	Demand (gpm)
J-1	2,119.00	2,242.46	53	1	0
J-4	2,117.00	2,239.97	53	1	0
J-5	2,116.00	2,239.89	54	1	0
J-6	2,116.00	2,239.88	54	1	0
J-7	2,116.00	2,239.88	54	1	2
J-8	2,112.00	2,239.81	55	1	3
J-9	2,112.00	2,239.81	55	1	0
J-10	2,109.00	2,239.78	57	1	10
J-11	2,109.00	2,239.78	57	1	0
J-12	2,106.00	2,239.77	58	1	7
J-13	2,104.00	2,239.76	59	1	5
J-14	2,103.00	2,239.76	59	1	8
J-15	2,101.00	2,239.76	60	1	7
J-16	2,100.00	2,239.76	60	1	0
J-17	2,100.00	2,239.76	60	1	2
J-18	2,097.00	2,239.76	62	1	10
J-19	2,094.00	2,239.75	63	1	3
J-20	2,093.00	2,239.74	63	1	9
J-21	2,089.00	2,239.74	65	1	0
J-22	2,089.00	2,239.74	65	1	11
J-23	2,087.00	2,239.73	66	1	0
J-24	2,087.00	2,239.73	66	1	9
J-25	2,085.00	2,239.73	67	1	0
J-26	2,116.00	2,239.88	54	1	0
J-27	2,116.00	2,239.88	54	1	0
J-28	2,116.00	2,239.88	54	1	0
J-29	2,113.00	2,239.81	55	1	6
J-30	2,110.00	2,239.78	56	1	2
J-31	2,111.00	2,239.78	56	1	5
J-32	2,111.00	2,239.78	56	1	0
J-33	2,109.00	2,239.78	57	1	0
J-34	2,107.00	2,239.77	57	1	9
J-35	2,106.00	2,239.77	58	1	9
J-36	2,106.00	2,239.77	58	1	0
J-37	2,103.00	2,239.76	59	1	8
J-38	2,101.00	2,239.76	60	1	10
J-39	2,098.00	2,239.76	61	1	9
J-40	2,094.00	2,239.75	63	1	0
J-41	2,108.00	2,239.77	57	1	0
J-42	2,108.00	2,239.77	57	1	10
J-43	2,108.00	2,239.77	57	1	0
J-44	2,110.00	2,239.78	56	1	0
J-45	2,109.00	2,239.60	57	1	0
J-46	2,109.00	2,239.59	57	1	0
J-47	2,108.00	2,239.59	57	1	0
J-48	2,113.00	2,239.58	55	1	1
J-49	2,104.00	2,239.52	59	1	2
J-50	2,110.00	2,239.78	56	1	0

FlexTable: Junction Table

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Unit Demand Collection <Count>	Demand (gpm)
J-51	2,112.00	2,239.81	55	1	0
J-52	2,112.00	2,239.80	55	1	0
J-53	2,112.00	2,239.80	55	1	0
J-54	2,114.00	2,239.78	54	1	3
J-55	2,114.00	2,239.78	54	1	0
J-56	2,112.00	2,239.80	55	1	0
J-57	2,110.00	2,239.77	56	1	10
J-58	2,109.00	2,239.77	57	1	9
J-59	2,107.00	2,239.77	57	1	0
J-61	2,100.00	2,239.76	60	1	0
J-62	2,100.00	2,239.76	60	1	2
J-63	2,099.00	2,239.76	61	1	3
J-64	2,098.00	2,239.76	61	1	2
J-65	2,096.00	2,239.76	62	1	0
J-66	2,093.00	2,239.75	63	1	5
J-67	2,096.00	2,239.75	62	1	7
J-68	2,091.00	2,239.74	64	1	0
J-69	2,091.00	2,239.73	64	1	6
J-70	2,088.00	2,239.73	66	1	9
J-71	2,090.00	2,239.73	65	1	0
J-72	2,088.00	2,239.73	66	1	1
J-73	2,086.00	2,239.73	67	1	0
J-74	2,086.00	2,239.73	67	1	0
J-75	2,084.00	2,239.73	67	1	3
J-76	2,086.00	2,239.73	67	1	3
J-77	2,084.00	2,239.73	67	1	1
J-78	2,086.00	2,239.73	67	1	3
J-79	2,086.00	2,239.73	67	1	5
J-80	2,085.00	2,239.73	67	1	5
J-81	2,083.00	2,239.73	68	1	5
J-82	2,084.00	2,239.73	67	1	7
J-83	2,107.00	2,239.77	57	1	0
J-84	2,104.00	2,239.77	59	1	0
J-85	2,103.00	2,239.76	59	1	0
J-86	2,106.00	2,239.77	58	1	9
J-87	2,109.00	2,239.79	57	1	7
J-88	2,109.00	2,239.77	57	1	0
J-89	2,103.00	2,239.78	59	1	7
J-90	2,100.00	2,239.79	60	1	7
J-91	2,091.00	2,239.74	64	1	5
J-92	2,100.00	2,239.79	60	1	0
J-93	2,099.00	2,239.79	61	1	0
J-97	2,104.00	2,239.78	59	1	0
J-98	2,103.00	2,239.78	59	1	0
J-100	2,096.00	2,239.76	62	1	7
J-102	2,096.00	2,239.75	62	1	0
J-103	2,091.00	2,239.75	64	1	6
J-104	2,091.00	2,239.74	64	1	0

FlexTable: Junction Table

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Unit Demand Collection <Count>	Demand (gpm)
J-105	2,088.00	2,239.73	66	1	9
J-106	2,088.00	2,239.73	66	1	0
J-107	2,087.00	2,239.73	66	1	0
J-108	2,087.00	2,239.73	66	1	9
J-109	2,084.00	2,239.73	67	1	0
J-110	2,084.00	2,239.73	67	1	9
J-111	2,087.00	2,239.73	66	1	0
J-113	2,087.00	2,239.73	66	1	0
J-114	2,087.00	2,239.73	66	1	9
J-115	2,085.00	2,239.73	67	1	0
J-116	2,083.00	2,239.73	68	1	1
J-117	2,084.00	2,239.73	67	1	5
J-118	2,084.00	2,239.73	67	1	0
J-119	2,085.00	2,239.73	67	1	0
J-120	2,080.00	2,239.73	69	1	1
J-121	2,079.00	2,239.73	70	1	3
J-122	2,077.00	2,239.73	70	1	0
J-123	2,078.00	2,239.73	70	1	0
J-124	2,080.00	2,239.73	69	1	0
J-125	2,110.00	2,239.73	56	1	1
J-131	2,087.00	2,239.73	66	1	6
J-132	2,100.00	2,239.83	60	1	2
J-133	2,102.00	2,239.94	60	1	26
J-134	2,107.00	2,240.01	58	1	23
J-135	2,106.00	2,240.04	58	1	0
J-136	2,106.00	2,240.02	58	1	1
J-137	2,106.00	2,240.02	58	1	0
J-138	2,104.00	2,239.98	59	1	0
J-139	2,102.00	2,239.95	60	1	3
J-140	2,098.00	2,239.76	61	1	0
J-141	2,094.00	2,239.75	63	1	0
J-300	2,115.00	2,240.89	54	0	0
J-301	2,110.00	2,240.28	56	0	0
J-303	2,095.00	2,239.77	63	1	6
J-304	2,091.00	2,239.75	64	1	0
J-305	2,087.00	2,239.73	66	1	7
J-306	2,085.60	2,239.73	67	0	0
J-307	2,101.99	2,239.76	60	1	0

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Length (ft)
P-4	346	J-4	J-5	10.0	PVC	150.0	193	0.79	346
P-5	77	J-5	J-6	10.0	PVC	150.0	193	0.79	77
P-6	16	J-6	J-7	10.0	PVC	150.0	151	0.62	16
P-7	472	J-7	J-8	10.0	PVC	150.0	149	0.61	472
P-8	20	J-8	J-9	10.0	PVC	150.0	145	0.59	20
P-10	25	J-10	J-11	6.0	PVC CIP 20	130.0	19	0.22	25
P-11	370	J-11	J-12	6.0	PVC CIP 20	130.0	16	0.18	370
P-12	286	J-12	J-13	6.0	PVC CIP 20	130.0	9	0.10	286
P-13	156	J-13	J-14	6.0	PVC CIP 20	150.0	14	0.16	156
P-14A	134	J-307	J-15	8.0	PVC CIP 20	150.0	19	0.12	134
P-14B	136	J-14	J-307	8.0	PVC CIP 20	150.0	1	0.00	136
P-15	174	J-15	J-16	8.0	PVC CIP 20	150.0	10	0.06	174
P-16	35	J-16	J-17	10.0	PVC CIP 20	150.0	44	0.18	35
P-17	236	J-17	J-18	10.0	PVC	150.0	21	0.09	236
P-19	294	J-19	J-20	8.0	PVC CIP 20	150.0	35	0.22	294
P-20	258	J-20	J-21	8.0	PVC CIP 20	150.0	20	0.13	258
P-21	11	J-21	J-22	8.0	PVC CIP 20	150.0	20	0.13	11
P-22	285	J-22	J-23	6.0	PVC CIP 20	150.0	12	0.13	285
P-23	17	J-23	J-24	6.0	PVC CIP 20	150.0	12	0.13	17
P-24	174	J-24	J-25	6.0	PVC CIP 20	150.0	-3	0.03	174
P-25	13	J-6	J-26	8.0	PVC	150.0	42	0.27	13
P-26	10	J-26	J-27	8.0	PVC	150.0	42	0.27	10
P-27	20	J-27	J-28	8.0	PVC	150.0	42	0.27	20
P-28	407	J-28	J-29	6.0	PVC	150.0	42	0.47	407
P-29	300	J-11	J-30	4.0	PVC	150.0	4	0.09	300
P-30	232	J-30	J-31	4.0	PVC	150.0	-4	0.10	232
P-31	10	J-31	J-32	4.0	PVC	150.0	0	0.00	10
P-32	14	J-10	J-33	10.0	PVC	150.0	67	0.28	14
P-33	275	J-33	J-34	10.0	PVC	150.0	67	0.28	275
P-34	296	J-34	J-35	10.0	PVC	150.0	55	0.22	296
P-35	9	J-35	J-36	10.0	PVC	150.0	35	0.14	9
P-36	294	J-36	J-37	10.0	PVC	150.0	35	0.14	294
P-37	269	J-37	J-38	10.0	PVC	150.0	5	0.02	269
P-39	387	J-39	J-40	10.0	PVC	150.0	65	0.27	387

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Length (ft)
P-40	10	J-40	J-19	8.0	PVC CIP 20	150.0	65	0.42	10
P-41	366	J-30	J-41	4.0	PVC	150.0	5	0.13	366
P-42	4	J-41	J-42	4.0	PVC	150.0	5	0.14	4
P-43	48	J-42	J-43	4.0	PVC	150.0	-5	0.12	48
P-44	488	J-43	J-44	4.0	PVC	150.0	-5	0.12	488
P-45	548	J-44	J-45	2.0	PVC	150.0	3	0.35	548
P-46	120	J-45	J-46	2.0	PVC	150.0	1	0.12	120
P-47	428	J-46	J-47	2.0	PVC	150.0	0	0.00	428
P-48	204	J-46	J-48	2.0	PVC	150.0	1	0.12	204
P-49	488	J-45	J-49	2.0	PVC	150.0	2	0.23	488
P-50	21	J-44	J-50	4.0	PVC	150.0	0	0.00	21
P-51	300	J-12	J-41	6.0	PVC CIP 20	130.0	0	0.00	300
P-52	12	J-9	J-51	10.0	PVC	150.0	145	0.59	12
P-53	377	J-51	J-10	10.0	PVC	150.0	97	0.40	377
P-55	9	J-52	J-53	6.0	PVC CIP 20	130.0	20	0.23	9
P-56	306	J-53	J-54	6.0	PVC CIP 20	130.0	20	0.23	306
P-57	7	J-54	J-55	6.0	PVC CIP 20	130.0	0	0.00	7
P-58	11	J-51	J-56	6.0	PVC CIP 20	130.0	48	0.55	11
P-59	3	J-56	J-52	6.0	PVC CIP 20	130.0	48	0.55	3
P-60	277	J-52	J-57	6.0	PVC CIP 20	130.0	28	0.32	277
P-61	293	J-57	J-58	6.0	PVC CIP 20	130.0	11	0.13	293
P-62	228	J-58	J-59	6.0	PVC CIP 20	150.0	8	0.09	228
P-63	147	J-59	J-35	6.0	PVC CIP 20	130.0	8	0.09	147
P-65	381	J-37	J-61	10.0	PVC	150.0	34	0.14	381
P-66	13	J-61	J-16	10.0	PVC	150.0	34	0.14	13
P-67	427	J-14	J-62	6.0	PVC CIP 20	150.0	5	0.06	427
P-68	114	J-62	J-63	6.0	PVC CIP 20	150.0	3	0.04	114
P-69	157	J-63	J-64	6.0	PVC CIP 20	150.0	0	0.00	157
P-70	429	J-64	J-15	6.0	PVC CIP 20	150.0	-3	0.03	429
P-71	295	J-17	J-65	8.0	PVC	150.0	20	0.13	295
P-72	521	J-65	J-66	8.0	PVC	150.0	20	0.13	521
P-73	327	J-66	J-67	8.0	PVC CIP 20	150.0	7	0.04	327
P-74	242	J-66	J-68	4.0	PVC	150.0	8	0.21	242
P-75	48	J-68	J-69	4.0	PVC	150.0	8	0.21	48

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Length (ft)
P-76	300	J-69	J-70	6.0	PVC CIP 20	150.0	2	0.02	300
P-77	138	J-69	J-71	6.0	PVC CIP 20	130.0	1	0.01	138
P-78	136	J-71	J-72	4.0	PVC	150.0	1	0.03	136
P-79	336	J-70	J-73	10.0	PVC	150.0	23	0.10	336
P-80	44	J-73	J-74	8.0	PVC CIP 20	150.0	11	0.07	44
P-81	323	J-74	J-75	8.0	PVC CIP 20	150.0	11	0.07	323
P-82	202	J-75	J-76	8.0	PVC	150.0	8	0.05	202
P-83	424	J-76	J-77	8.0	PVC	150.0	5	0.03	424
P-84	185	J-77	J-78	8.0	PVC	150.0	3	0.02	185
P-85	38	J-73	J-79	6.0	PVC	150.0	12	0.14	38
P-87	259	J-80	J-81	6.0	PVC	150.0	7	0.08	259
P-88	400	J-81	J-82	6.0	PVC CIP 20	150.0	3	0.03	400
P-90	376	J-57	J-34	6.0	PVC CIP 20	130.0	6	0.07	376
P-91	33	J-34	J-83	6.0	PVC CIP 20	130.0	10	0.11	33
P-92	339	J-83	J-84	6.0	PVC CIP 20	130.0	10	0.11	339
P-93	24	J-84	J-13	4.0	PVC CIP 20	130.0	10	0.25	24
P-94	16	J-37	J-85	6.0	PVC CIP 20	130.0	-12	0.14	16
P-95	358	J-85	J-86	6.0	PVC CIP 20	130.0	-12	0.14	358
P-96	458	J-86	J-87	6.0	PVC CIP 20	130.0	-15	0.17	458
P-97	46	J-58	J-88	6.0	PVC CIP 20	130.0	-6	0.07	46
P-98	257	J-88	J-86	6.0	PVC CIP 20	130.0	-6	0.07	257
P-99	270	J-86	J-89	6.0	PVC CIP 20	130.0	-12	0.13	270
P-100	290	J-89	J-90	6.0	PVC CIP 20	130.0	-21	0.24	290
P-101	418	J-19	J-91	10.0	PVC	150.0	58	0.24	418
P-102	403	J-91	J-70	10.0	PVC	150.0	40	0.16	403
P-103	22	J-90	J-92	10.0	PVC CIP 20	130.0	95	0.39	22
P-104	57	J-92	J-93	10.0	PVC CIP 20	130.0	95	0.39	57
P-108	281	J-89	J-97	6.0	PVC CIP 20	130.0	-14	0.16	281
P-109	14	J-89	J-98	6.0	PVC CIP 20	130.0	16	0.18	14
P-110	360	J-98	J-38	6.0	PVC CIP 20	130.0	16	0.18	360
P-111	394	J-38	J-18	8.0	PVC CIP 20	130.0	19	0.12	394
P-115	329	J-100	J-303	6.0	PVC CIP 20	150.0	-18	0.21	329
P-116	9	J-100	J-102	4.0	PVC	150.0	16	0.41	9
P-117	259	J-102	J-103	6.0	PVC CIP 20	150.0	16	0.18	259

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Length (ft)
P-118	373	J-103	J-22	6.0	PVC CIP 20	150.0	16	0.18	373
P-119	371	J-100	J-20	4.0	PVC	150.0	7	0.18	371
P-120	14	J-91	J-104	8.0	PVC	150.0	13	0.08	14
P-121	280	J-104	J-105	6.0	PVC CIP	150.0	13	0.15	280
P-122	18	J-105	J-106	6.0	PVC	150.0	10	0.12	18
P-123	239	J-106	J-107	6.0	PVC	150.0	10	0.12	239
P-124	380	J-82	J-108	6.0	PVC CIP 20	150.0	-8	0.09	380
P-125	422	J-108	J-22	6.0	PVC CIP 20	150.0	-13	0.15	422
P-126	13	J-107	J-108	6.0	PVC CIP 20	150.0	10	0.12	13
P-127	281	J-108	J-109	6.0	PVC	150.0	6	0.07	281
P-128	20	J-109	J-110	6.0	PVC	150.0	6	0.07	20
P-129	425	J-110	J-24	6.0	PVC CIP 20	150.0	-10	0.11	425
P-130	298	J-24	J-111	6.0	PVC CIP 20	150.0	-5	0.05	298
P-132	153	J-70	J-113	6.0	PVC CIP 20	150.0	9	0.10	153
P-133	137	J-113	J-114	6.0	PVC CIP 20	150.0	9	0.10	137
P-134	285	J-79	J-115	6.0	PVC	150.0	7	0.08	285
P-135	17	J-115	J-80	6.0	PVC	150.0	12	0.14	17
P-136	373	J-114	J-115	6.0	PVC CIP 20	150.0	6	0.07	373
P-137	140	J-115	J-116	6.0	PVC CIP 20	150.0	1	0.01	140
P-138	406	J-114	J-105	6.0	PVC CIP 20	150.0	-6	0.07	406
P-139	419	J-20	J-105	6.0	PVC CIP 20	150.0	13	0.14	419
P-140	385	J-110	J-117	6.0	PVC CIP 20	150.0	7	0.08	385
P-141	34	J-117	J-118	6.0	PVC CIP 20	130.0	6	0.07	34
P-142	320	J-118	J-119	8.0	PVC CIP 20	130.0	6	0.04	320
P-143	341	J-119	J-120	8.0	PVC CIP 20	130.0	1	0.01	341
P-144	358	J-119	J-121	6.0	PVC CIP 20	130.0	3	0.04	358
P-145	837	J-119	J-122	6.0	PVC CIP 20	130.0	1	0.01	837
P-146	446	J-122	J-123	6.0	PVC CIP 20	130.0	1	0.01	446
P-147	283	J-123	J-124	6.0	PVC CIP 20	130.0	1	0.01	283
P-148	100	J-124	J-125	6.0	PVC CIP 20	130.0	1	0.01	100
P-154A	344	J-25	J-306	6.0	PVC CIP 20	150.0	-3	0.03	344
P-154B	798	J-306	J-131	6.0	PVC CIP 20	150.0	6	0.07	798
P-155	169	J-90	J-132	10.0	PVC CIP 20	130.0	-172	0.70	169
P-156	435	J-132	J-133	10.0	PVC CIP 20	130.0	-174	0.71	435

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Length (ft)
P-157	320	J-133	J-134	10.0	PVC CIP 20	130.0	-162	0.66	320
P-158	145	J-134	J-135	10.0	PVC CIP 20	150.0	-185	0.76	145
P-159	92	J-135	J-136	6.0	PVC CIP 20	150.0	43	0.49	92
P-160	25	J-136	J-137	6.0	PVC	150.0	42	0.48	25
P-161	229	J-137	J-138	6.0	PVC	150.0	42	0.48	229
P-162	203	J-138	J-139	6.0	PVC	150.0	42	0.48	203
P-163	71	J-139	J-133	6.0	PVC	150.0	38	0.44	71
P-164	296	J-38	J-140	10.0	PVC	150.0	-9	0.04	296
P-165	37	J-140	J-39	10.0	PVC	150.0	86	0.35	37
P-166	293	J-140	J-93	10.0	PVC CIP 20	130.0	-95	0.39	293
P-168	292	J-18	J-141	8.0	PVC CIP 20	130.0	30	0.19	292
P-169	39	J-141	J-19	8.0	PVC CIP 20	130.0	30	0.19	39
P-173	295	J-100	J-39	6.0	PVC CIP 20	150.0	-12	0.14	295
P-186	184	T-1	J-1	6.0	PVC	150.0	0	0.00	150
P-300	1,265	J-1	J-300	10.0	PVC CIP	130.0	421	1.72	1,265
P-301	36	J-4	PMP-2 CIP	6.0	PVC CIP	130.0	0	0.00	36
P-302	362	J-304	J-305	6.0	PVC CIP	150.0	20	0.22	362
P-303	311	J-304	J-303	6.0	PVC CIP	150.0	-25	0.29	311
P-304	164	J-304	J-103	6.0	PVC CIP	150.0	6	0.06	164
P-305	49	J-111	J-305	6.0	PVC CIP	150.0	-5	0.05	49
P-306	1,045	J-301	J-4	10.0	PVC CIP	130.0	193	0.79	1,045
P-308	495	J-300	J-301	10.0	PVC CIP	130.0	421	1.72	495
P-309	203	J-301	J-135	8.0	PVC CIP	130.0	228	1.46	203
P-310	362	J-303	J-90	8.0	PVC CIP	130.0	-49	0.31	362
P-311	345	J-117	J-82	6.0	PVC CIP	130.0	-4	0.04	345
P-312	169	J-305	J-306	8.0	PVC CIP	130.0	8	0.05	169
P-313	483	J-31	J-44	8.0	PVC CIP	130.0	8	0.05	483
P-314	191	T-2 CIP	J-1	8.0	PVC CIP	150.0	421	2.69	191
P-315	24	PMP-2 CIP	R-2 CIP	8.0	PVC CIP	130.0	0	0.00	24
P-319	663	J-87	J-29	8.0	PVC CIP	130.0	-36	0.23	663
P-320	324	J-97	J-87	8.0	PVC CIP	130.0	-14	0.09	324
P-322	397	J-307	J-35	8.0	PVC CIP	130.0	-19	0.12	397
P-323	463	J-54	J-31	8.0	PVC CIP	130.0	17	0.11	463

FlexTable: Pump Table

Label	Elevation (ft)	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	2,190.00	Off	(N/A)	(N/A)	(N/A)	(N/A)
PMP-2 CIP	2,015.00	Off	2,239.97	2,100.00	0	0.00

FlexTable: Tank Table

Label	Elevation (Base) (ft)	Elevation (Minimum) (ft)	Elevation (Initial) (ft)	Elevation (Maximum) (ft)	Diameter (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)	Is Active?
T-1	2,210.00	2,210.00	2,227.25	2,227.25	34.50	0	2,227.25	True
T-2 CIP	2,210.00	2,210.00	2,243.00	2,250.00	30.00	421	2,243.00	True

Appendix C-6

Water Modeling Results for Year 20 – Fire Flow Analysis

Fire Flow Node FlexTable: Fire Flow Report

Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Flow (Total Needed) (gpm)	Flow (Total Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual) (psi)	Pressure (Zone Lower Limit) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Junction w/ Minimum Pressure (Zone)	Pipe w/ Maximum Velocity	Velocity of Maximum Pipe (ft/s)
J-21	True	1,000	1,500	1,000	1,500	20	40	20	31	J-7	P-314	7.03
J-23	True	1,500	1,965	1,500	1,965	20	26	20	20	J-125	P-23	12.85
J-32	True	1,500	1,523	1,500	1,523	20	20	20	20	J-48	P-31	17.28
J-33	True	1,000	1,500	1,000	1,500	20	32	20	30	J-7	P-314	7.03
J-40	True	1,500	2,000	1,500	2,000	20	28	20	21	J-7	P-314	9.11
J-43	True	1,000	1,500	1,000	1,500	20	21	20	22	J-42	P-42	13.66
J-53	True	1,000	1,500	1,000	1,500	20	30	20	30	J-55	P-55	15.32
J-55	True	1,000	1,500	1,000	1,500	20	21	20	21	J-54	P-57	17.02
J-61	True	1,500	2,000	1,500	2,000	20	26	20	21	J-54	P-314	9.11
J-63	True	1,000	1,500	1,002	1,502	20	28	20	29	J-62	P-67	8.66
J-65	True	1,500	2,000	1,500	2,000	20	22	20	21	J-54	P-71	11.10
J-67	True	1,500	1,706	1,503	1,709	20	20	20	27	J-66	P-73	10.91
J-76	True	1,500	1,867	1,502	1,868	20	20	20	20	J-78	P-81	11.95
J-78	True	1,000	1,500	1,002	1,502	20	25	20	28	J-77	P-81	9.61
J-80	True	1,000	1,500	1,002	1,502	20	38	20	31	J-7	P-135	12.33
J-82	True	1,000	1,500	1,003	1,503	20	38	20	28	J-125	P-314	7.03
J-83	True	1,000	1,500	1,000	1,500	20	32	20	31	J-7	P-91	13.41
J-84	True	1,000	1,500	1,000	1,500	20	32	20	31	J-7	P-93	11.58
J-85	True	1,000	1,500	1,000	1,500	20	35	20	31	J-7	P-94	14.13
J-87	True	1,000	1,500	1,003	1,503	20	29	20	29	J-29	P-314	7.03
J-88	True	1,000	1,500	1,000	1,500	20	29	20	30	J-58	P-97	10.21
J-97	True	1,000	1,500	1,000	1,500	20	30	20	29	J-29	P-108	7.53
J-98	True	1,000	1,500	1,000	1,500	20	33	20	31	J-28	P-109	12.23
J-102	True	1,000	1,500	1,000	1,500	20	36	20	31	J-7	P-116	12.00
J-104	True	1,500	2,000	1,500	2,000	20	28	20	20	J-125	P-120	10.81
J-106	True	1,000	1,500	1,000	1,500	20	39	20	31	J-7	P-122	12.00
J-107	True	1,000	1,500	1,000	1,500	20	39	20	30	J-125	P-126	10.76
J-109	True	1,000	1,500	1,000	1,500	20	38	20	29	J-125	P-128	9.70
J-111	True	1,000	1,500	1,000	1,500	20	36	20	31	J-7	P-305	10.43
J-113	True	1,000	1,500	1,000	1,500	20	38	20	31	J-7	P-132	9.46
J-116	True	1,000	1,500	1,001	1,501	20	32	20	31	J-7	P-137	17.03
J-118	True	1,000	1,500	1,000	1,500	20	33	20	22	J-125	P-141	9.59
J-131	True	1,000	1,131	1,003	1,134	20	20	20	37	J-4	P-154B	12.86
J-135	True	1,500	2,000	1,500	2,000	20	26	20	23	J-7	P-309	9.58
J-137	True	1,000	1,500	1,000	1,500	20	32	20	32	J-4	P-159	11.71

FlexTable: Junction Table

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Unit Demand Collection <Count>	Demand (gpm)
J-1	2,119.00	2,224.59	46	1	0
J-4	2,117.00	2,224.02	46	1	0
J-5	2,116.00	2,224.00	47	1	0
J-6	2,116.00	2,224.00	47	1	0
J-7	2,116.00	2,224.00	47	1	1
J-8	2,112.00	2,223.98	48	1	2
J-9	2,112.00	2,223.98	48	1	0
J-10	2,109.00	2,223.98	50	1	5
J-11	2,109.00	2,223.98	50	1	0
J-12	2,106.00	2,223.97	51	1	3
J-13	2,104.00	2,223.97	52	1	2
J-14	2,103.00	2,223.97	52	1	4
J-15	2,101.00	2,223.97	53	1	3
J-16	2,100.00	2,223.97	54	1	0
J-17	2,100.00	2,223.97	54	1	1
J-18	2,097.00	2,223.97	55	1	5
J-19	2,094.00	2,223.97	56	1	2
J-20	2,093.00	2,223.97	57	1	4
J-21	2,089.00	2,223.97	58	1	0
J-22	2,089.00	2,223.97	58	1	5
J-23	2,087.00	2,223.96	59	1	0
J-24	2,087.00	2,223.96	59	1	4
J-25	2,085.00	2,223.96	60	1	0
J-26	2,116.00	2,224.00	47	1	0
J-27	2,116.00	2,224.00	47	1	0
J-28	2,116.00	2,224.00	47	1	0
J-29	2,113.00	2,223.98	48	1	3
J-30	2,110.00	2,223.97	49	1	1
J-31	2,111.00	2,223.98	49	1	2
J-32	2,111.00	2,223.98	49	1	0
J-33	2,109.00	2,223.98	50	1	0
J-34	2,107.00	2,223.97	51	1	4
J-35	2,106.00	2,223.97	51	1	4
J-36	2,106.00	2,223.97	51	1	0
J-37	2,103.00	2,223.97	52	1	4
J-38	2,101.00	2,223.97	53	1	5
J-39	2,098.00	2,223.97	55	1	4
J-40	2,094.00	2,223.97	56	1	0
J-41	2,108.00	2,223.97	50	1	0
J-42	2,108.00	2,223.97	50	1	5
J-43	2,108.00	2,223.97	50	1	0
J-44	2,110.00	2,223.97	49	1	0
J-45	2,109.00	2,223.93	50	1	0
J-46	2,109.00	2,223.93	50	1	0
J-47	2,108.00	2,223.93	50	1	0
J-48	2,113.00	2,223.93	48	1	1
J-49	2,104.00	2,223.92	52	1	1
J-50	2,110.00	2,223.97	49	1	0

FlexTable: Junction Table

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Unit Demand Collection <Count>	Demand (gpm)
J-51	2,112.00	2,223.98	48	1	0
J-52	2,112.00	2,223.98	48	1	0
J-53	2,112.00	2,223.98	48	1	0
J-54	2,114.00	2,223.98	48	1	2
J-55	2,114.00	2,223.98	48	1	0
J-56	2,112.00	2,223.98	48	1	0
J-57	2,110.00	2,223.97	49	1	5
J-58	2,109.00	2,223.97	50	1	4
J-59	2,107.00	2,223.97	51	1	0
J-61	2,100.00	2,223.97	54	1	0
J-62	2,100.00	2,223.97	54	1	1
J-63	2,099.00	2,223.97	54	1	2
J-64	2,098.00	2,223.97	55	1	1
J-65	2,096.00	2,223.97	55	1	0
J-66	2,093.00	2,223.97	57	1	2
J-67	2,096.00	2,223.97	55	1	3
J-68	2,091.00	2,223.97	58	1	0
J-69	2,091.00	2,223.96	58	1	3
J-70	2,088.00	2,223.96	59	1	4
J-71	2,090.00	2,223.96	58	1	0
J-72	2,088.00	2,223.96	59	1	1
J-73	2,086.00	2,223.96	60	1	0
J-74	2,086.00	2,223.96	60	1	0
J-75	2,084.00	2,223.96	61	1	2
J-76	2,086.00	2,223.96	60	1	2
J-77	2,084.00	2,223.96	61	1	1
J-78	2,086.00	2,223.96	60	1	2
J-79	2,086.00	2,223.96	60	1	2
J-80	2,085.00	2,223.96	60	1	2
J-81	2,083.00	2,223.96	61	1	2
J-82	2,084.00	2,223.96	61	1	3
J-83	2,107.00	2,223.97	51	1	0
J-84	2,104.00	2,223.97	52	1	0
J-85	2,103.00	2,223.97	52	1	0
J-86	2,106.00	2,223.97	51	1	4
J-87	2,109.00	2,223.98	50	1	3
J-88	2,109.00	2,223.97	50	1	0
J-89	2,103.00	2,223.97	52	1	3
J-90	2,100.00	2,223.98	54	1	3
J-91	2,091.00	2,223.97	58	1	2
J-92	2,100.00	2,223.98	54	1	0
J-93	2,099.00	2,223.98	54	1	0
J-97	2,104.00	2,223.98	52	1	0
J-98	2,103.00	2,223.97	52	1	0
J-100	2,096.00	2,223.97	55	1	3
J-102	2,096.00	2,223.97	55	1	0
J-103	2,091.00	2,223.97	58	1	3
J-104	2,091.00	2,223.97	58	1	0

FlexTable: Junction Table

Label	Elevation (ft)	Hydraulic Grade (ft)	Pressure (psi)	Unit Demand Collection <Count>	Demand (gpm)
J-105	2,088.00	2,223.96	59	1	4
J-106	2,088.00	2,223.96	59	1	0
J-107	2,087.00	2,223.96	59	1	0
J-108	2,087.00	2,223.96	59	1	4
J-109	2,084.00	2,223.96	61	1	0
J-110	2,084.00	2,223.96	61	1	4
J-111	2,087.00	2,223.96	59	1	0
J-113	2,087.00	2,223.96	59	1	0
J-114	2,087.00	2,223.96	59	1	4
J-115	2,085.00	2,223.96	60	1	0
J-116	2,083.00	2,223.96	61	1	1
J-117	2,084.00	2,223.96	61	1	2
J-118	2,084.00	2,223.96	61	1	0
J-119	2,085.00	2,223.96	60	1	0
J-120	2,080.00	2,223.96	62	1	1
J-121	2,079.00	2,223.96	63	1	2
J-122	2,077.00	2,223.96	64	1	0
J-123	2,078.00	2,223.96	63	1	0
J-124	2,080.00	2,223.96	62	1	0
J-125	2,110.00	2,223.96	49	1	1
J-131	2,087.00	2,223.96	59	1	3
J-132	2,100.00	2,223.99	54	1	1
J-133	2,102.00	2,224.01	53	1	12
J-134	2,107.00	2,224.03	51	1	10
J-135	2,106.00	2,224.03	51	1	0
J-136	2,106.00	2,224.03	51	1	1
J-137	2,106.00	2,224.03	51	1	0
J-138	2,104.00	2,224.02	52	1	0
J-139	2,102.00	2,224.01	53	1	2
J-140	2,098.00	2,223.97	55	1	0
J-141	2,094.00	2,223.97	56	1	0
J-300	2,115.00	2,224.23	47	0	0
J-301	2,110.00	2,224.09	49	0	0
J-303	2,095.00	2,223.97	56	1	3
J-304	2,091.00	2,223.97	58	1	0
J-305	2,087.00	2,223.96	59	1	3
J-306	2,085.60	2,223.96	60	0	0
J-307	2,101.99	2,223.97	53	1	0

FlexTable: Pump Table

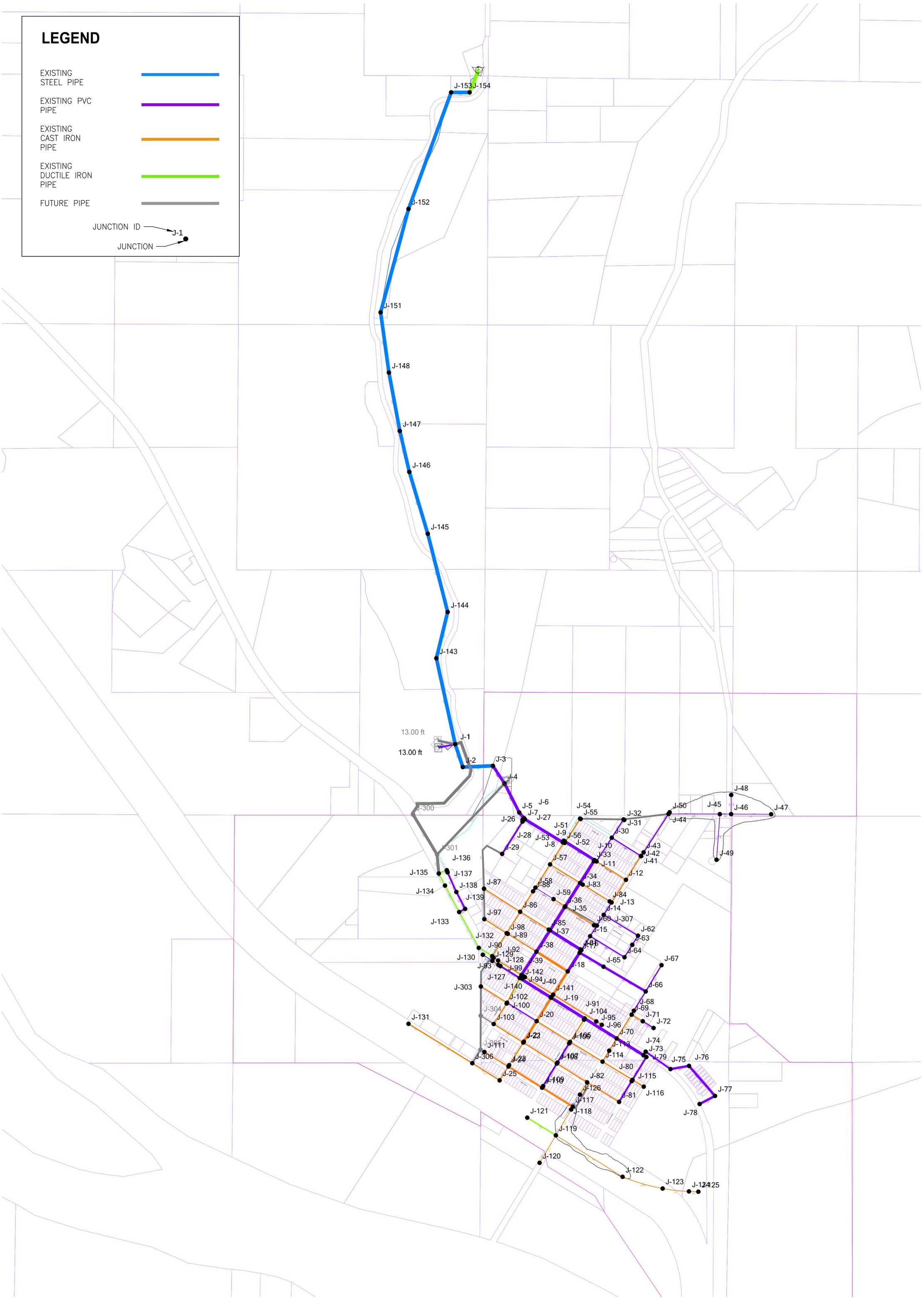
Label	Elevation (ft)	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	2,190.00	Off	(N/A)	(N/A)	(N/A)	(N/A)
PMP-2 CIP	2,015.00	Off	2,224.02	2,100.00	0	0.00

FlexTable: Tank Table

Label	Elevation (Base) (ft)	Elevation (Minimum) (ft)	Elevation (Initial) (ft)	Elevation (Maximum) (ft)	Diameter (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)	Is Active?
T-1	2,210.00	2,210.00	2,224.65	2,227.25	34.50	66	2,224.65	True
T-2 CIP	2,210.00	2,210.00	2,224.65	2,250.00	30.00	124	2,224.65	True

Appendix C-7

Water Modeling Backup Information



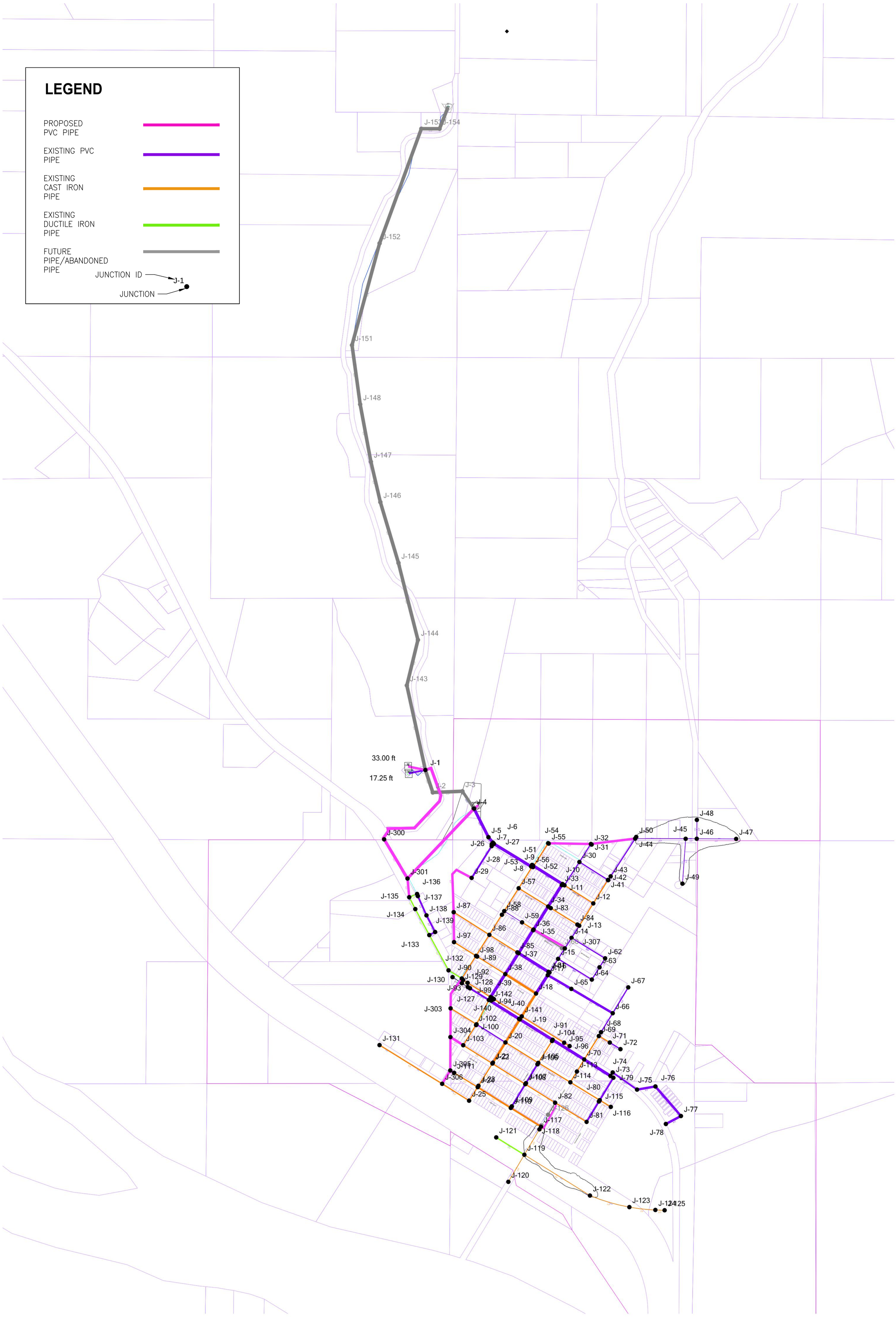
BASE YEAR

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CITY OF CLARK FORK
WATER FACILITIES PLAN
WATER MODEL NODE MAP

APPENDIX C-7



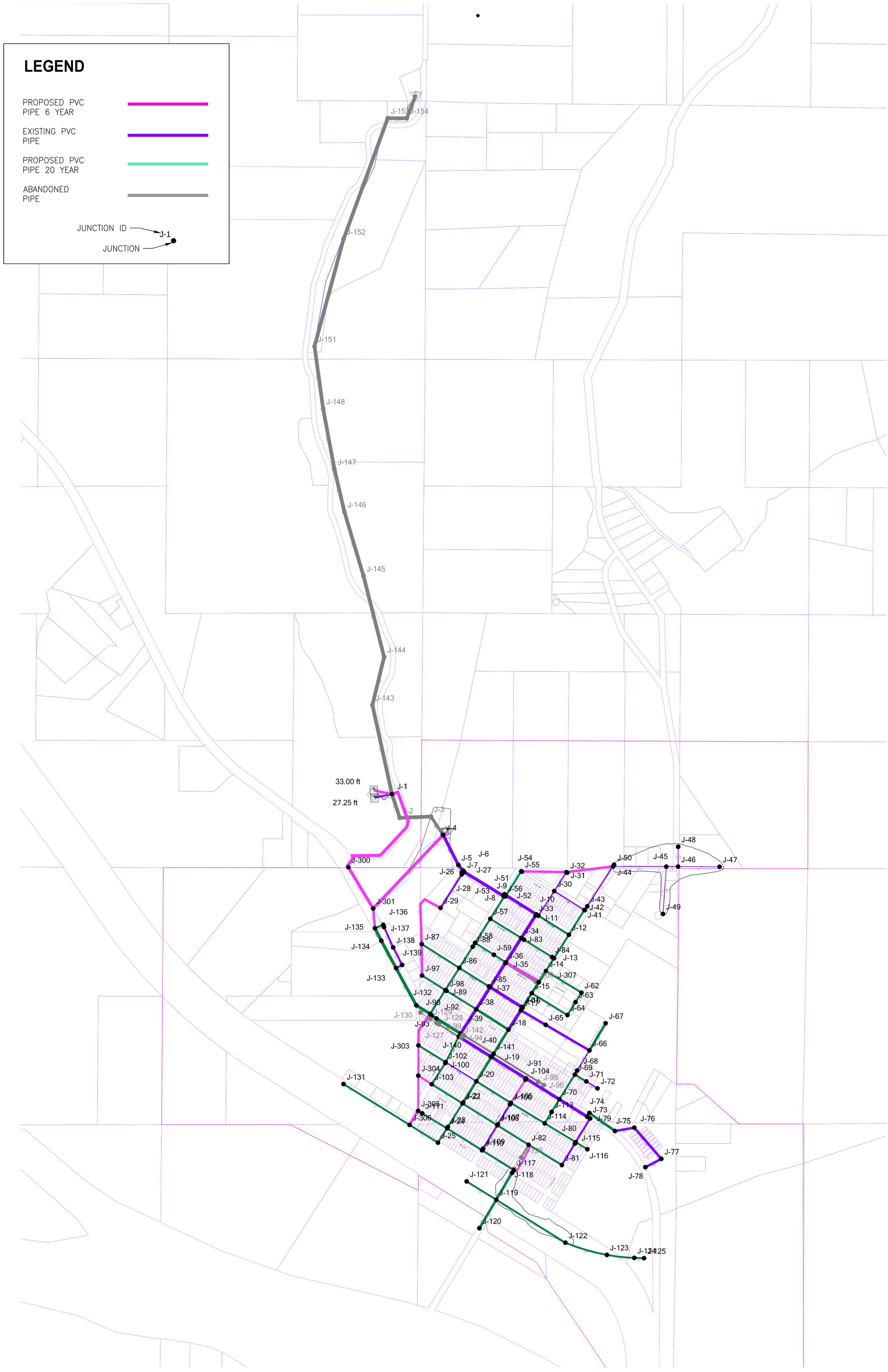
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6 YEAR

CITY OF CLARK FORK
WATER FACILITIES PLAN
WATER MODEL NODE MAP

APPENDIX C-7



20 YEAR

CITY OF CLARK FORK
WATER FACILITIES PLAN
WATER MODEL NODE MAP

APPENDIX C-7

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Church
Track & Field
Highschool
Nursery
Vacant
Library
Park
Trailer Park & Storage
MAIN STREET
SECOND AVE
THIRD AVE
FOURTH AVE
FIFTH AVE
SIXTH AVE
SEVENTH AVE
EIGHTH AVE
TENTH AVE
CLAYMAN STREET
STEPHEN STREET
BRYAN DRIVE
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Appendix D-1

Water System Operator Certifications

Appendix A-1

City of Clark Fork's Zoning Ordinance

IDAHO State of Idaho
Bureau Of Occupational Licens

Public Record Information

Name	Number	Expires	Action	Owner Name	City, State, Zip	Phone	Su
HANSEN, ROBERT F	BAT-530	11/6/2018			SANDPOINT ID 83864	208 265-4270	
HANSEN, ROBERT F	DWD2-13440	11/6/2018			SANDPOINT ID 83864	208 265-4270	
HANSEN, ROBERT F	DWT2-10694	11/6/2018			SANDPOINT ID 83864	208 265-4270	
HANSEN, ROBERT F	WWC2-13710	11/6/2018			SANDPOINT ID 83864	208 265-4270	
HANSEN, ROBERT F	WWT2-15575	11/6/2018			SANDPOINT ID 83864	208 265-4270	
HANSEN, ROBERT F	WWTL-10693	11/6/2018			SANDPOINT ID 83864	208 265-4270	
HANSEN, ROBERT F	WWTLA-14275	11/6/2018			SANDPOINT ID 83864	208 265-4270	

IDAHO State of Idaho
Bureau Of Occupational Licens

Public Record Information

Name	Number	Expires	Action	Owner Name	City, State, Zip	Phone	S
SOLOMON, JAY S	DWD1-21363	4/15/2019			BONNERS FERRY ID 83805	208 265-4270	
SOLOMON, JAY S	DWT2-22260	4/15/2020			BONNERS FERRY ID 83805	208 265-4270	
SOLOMON, JAY S	WWC1-21361	4/15/2019			BONNERS FERRY ID 83805	208 265-4270	
SOLOMON, JAY S	WWT2-22259	4/15/2020			BONNERS FERRY ID 83805	208 265-4270	

IDAHO State of Idaho
Bureau Of Occupational Licens

Public Record Information

Name	Number	Expires	Action	Owner Name	City, State, Zip	Phone	S
HUCKABY, EDWARD D	BAT-992	4/10/2019			SANDPOINT ID 83864	208 265-4270	
HUCKABY, EDWARD D	DWD2-14276	4/10/2019			SANDPOINT ID 83864	208 265-4270	
HUCKABY, EDWARD D	DWT1-10804	4/10/2019			SANDPOINT ID 83864	208 265-4270	

Appendix D-2

Emergency Contact List

Emergency Contacts City of Clark Fork

Russ Schenck (Mayor) 208-290-4289

Ben Dooley (maintenance #1) 208-610-6877

Eric Babcock (maintenance #2)

Bob Hansen (licensed operator) 208-265-4270

Appendix D-3

Emergency Plan

City of Clark Fork

EMERGENCY RESPONSE PLAN FOR WATER SYSTEM FAILURE

The City has an emergency autodial alarm system for the water system. It activates upon a low capacity of 30%, a high capacity of 100%+ of the reservoir or if a fuse is blown. This alarm autodials the following officials: Mayor, Water Operation Manager, Maintenance Supervisor and Maintenance Assistant.

There are instances that the alarm would not be triggered. If a tree compromised the electrical lines along East Spring Creek Road, or there is an area power outage due to a storm, or the phone lines are compromised the auto dialer would not work. Due to these possible circumstances we visually check the pump house 5 days per week or if a storm has recently gone through the area – we physically check the pump house.

Efforts will be immediately instituted to repair the failure.

If the system can not be repaired in a timely manner or there are other circumstances that warrant it, the City Clerks will make phone calls to each household to instruct the residents of the situation and any efforts that they personally might make to provide for their own needs temporarily.

Appendix D-4

EPA “Emergency Response Plan Guidance for Small and Medium Community Water Systems”

EPA
United States
Environmental Protection
Agency

Emergency Response Plan Guidance for Small and Medium Community Water Systems

to Comply with the Public Health Security and Bioterrorism Preparedness and Response Act of 2002



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Office of Water (4601M)
EPA 816-R-04-002
www.epa.gov/safewater/security
April 2004

Printed on Recycled Paper

Disclaimer: This document is provided as guidance only. It contains nationally recognized standards on the types of information that should be contained in an Emergency Response Plan (ERP). EPA recognizes that sections of this guidance may not be applicable to every Community Water System (CWS) and all potential situations may not be identified. It is each CWS's responsibility to evaluate the potential vulnerabilities related to their system and determine the appropriate responses. As site-specific needs dictate, this guidance can be modified.

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Introduction

What is the purpose of this document?

The purpose of this document is to provide guidance on developing or revising Emergency Response Plans (ERPs) for small- and medium-sized community drinking water systems. An ERP is a documented plan that describes the actions that a Community Water System (CWS) would take in response to various major events. A major event refers to:

- Credible threats, indications of terrorism, or acts of terrorism;
- Major disasters or emergencies such as hurricanes, tornadoes, storms, earthquakes, fires, flood, or explosion regardless of cause; and
- Catastrophic incidents that leave extraordinary levels of mass casualties, damage, and disruption severely affecting the population, infrastructure, environment, economy, and government functions.

On June 12, 2002, President Bush signed into law the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (PL 107-188, referred to as the Bioterrorism Act). In the Bioterrorism Act, Congress recognizes the need for drinking water systems to undertake a more comprehensive view of water safety and security. The Act amends the Safe Drinking Water Act and specifies actions CWSs and the U.S. Environmental Protection Agency (USEPA) must take to improve the security of the Nation's drinking water infrastructure.

CWS characteristics vary greatly, so CWSs should apply the information contained in this document to meet their particular needs and circumstances. This document should be used as a flexible template.

Why should a CWS develop or revise an ERP?

Protecting public health is the primary goal of community drinking water systems, and having an up-to-date and workable ERP helps achieve this goal in any crisis situation. The Bioterrorism Act amends the Safe Drinking Water Act (SDWA) by adding, among other requirements, section 1433. Section 1433(b) requires community water systems serving populations greater than 3,300 to either prepare or revise an ERP that incorporates the results of its Vulnerability Assessment (VA). The ERP must include "plans, procedures, and identification of equipment that can be implemented or utilized in the event of a terrorist or other intentional attack" on the CWS. The ERP also must include "actions, procedures, and identification of equipment which can obviate or significantly lessen the impact of terrorist attacks or other intentional actions on the public health and the safety and supply of drinking water provided to communities and individuals."

Who should use this document?

In using the terms "small and medium-sized" within this document, USEPA is referring to CWS which serve populations from 3,301 to 99,999. A CWS serving a population from 3,301 to 99,999 should use this document to either develop or revise its ERP and address findings from its VA. A VA is also a requirement for a CWS serving a population greater than 3,300 under the Bioterrorism Act. Completing a VA is a necessary step before a comprehensive ERP can be developed or revised.

Note: Any reference to "CWS," "you," or "I" in this document is a reference to a CWS serving a population from 3,301 to 99,999 unless otherwise noted.

How do I use this document?

This document is divided into five sections that will assist you in developing or revising your ERP. The sections are:

I. **Before You Begin Developing or Revising Your ERP:** Describes steps and actions you would need to complete before you could successfully develop or revise your ERP.

II. **Emergency Response Plan—Eight Core Elements:** Describes core elements that are universal to any ERP. If you are beginning to develop your ERP, you should use this section as a general template. If you have an existing ERP, you can use this section to check if your existing ERP is comprehensive and complete. The core ERP elements are:

- ❑ System Specific Information;
- ❑ CWS Roles and Responsibilities;
- ❑ Communication Procedures: Who, What, and When;
- ❑ Personnel Safety;
- ❑ Identification of Alternate Water Sources;
- ❑ Replacement Equipment and Chemical Supplies;
- ❑ Property Protection; and
- ❑ Water Sampling and Monitoring.

III. **Putting Your ERP Together and ERP Activation:** Describes steps and issues you need to address once you have all your core ERP elements in place and how to put these elements together into a single comprehensive plan. Additionally, you will need to understand the types of events that will trigger use of the plan. An effective ERP now needs to address intentional acts of terrorism as well as other emergencies and natural disasters. Planning for these events makes developing, updating, and deciding to activate the ERP more challenging than in the past.

IV. **Action Plans:** Describes how Action Plans (AP) are developed and used to tailor emergency response actions to specific incidents or events. Under the Bioterrorism Act, you are required to address the findings of a VA in an ERP. An AP identifies the steps to take to address specific vulnerabilities and respond to a given incident.

V. **Next Steps:** Describes steps to take after completing an ERP, for example, submitting a certification to EPA, conducting training, and updating your plan.

Will my ERP contain sensitive information?

Your ERP may contain sensitive information, so you should consider steps you need to take to ensure the security of your ERP. Sensitive information should be placed in appendices, or in sections that are not readily available to unauthorized personnel. The ERP, however, should be easily accessible to authorized personnel and should be easily identifiable during a major event. Steps taken to limit access by unauthorized persons should consider local and state Freedom of Information Act (FOIA) laws. Alternatively, you can opt to make your ERP general in nature so that everyone can use it and not include specific information about system vulnerabilities.

A secure copy of your ERP should be maintained in an off-premises location in the event that your primary copy cannot be accessed.

I. Before You Begin Developing or Revising Your ERP

What steps do I need to take before I start to develop or revise my ERP?

Before you begin to develop or revise your ERP, there are two steps that you need to take. First, you need to have completed a VA as required under the Bioterrorism Act. The findings from your VA will be addressed in your ERP through specific Action Plans (AP), which are discussed in detail in Section IV, "Action Plans."

Second, you should identify and coordinate with first responders and ERP partners who will help and assist you during a major event. As required by Section 1433(b) of the Bioterrorism Act, partners should include, to the extent possible, Local Emergency Planning Committees (LEPCs) established under the Community Right-to-Know Act such as local law enforcement departments, fire departments, health departments, local environmental agencies, hospitals, broadcast and print media, community groups, and nearby utilities. Other partners could include State and Federal agencies, and laboratories. **Figure I-1** shows local entities (in the shaded area) as well as State and Federal entities (in the white area) that may assist you during a major event. EPA strongly recommends that you consult with local and State entities as you develop your ERP. The purpose of the consultation is to form partnerships and seek advice. Through these partnerships, each party knows and understands its role and responsibilities in emergency situations. These partnerships help everyone respond better to an emergency.

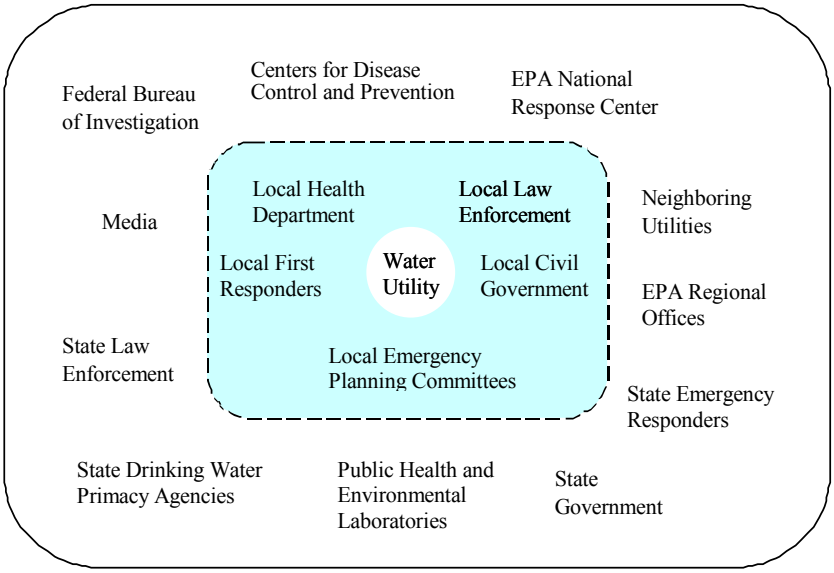


Figure I-1. Overview of ERP Partners

Are there any tools, training courses, or guides that can assist me in either developing or revising my ERP?

Emergency response has been around for quite some time, so many tools, training courses, and guides already exist on the topic of developing an ERP. Possible resources on how to develop or revise sections of your ERP include the following (see also the "References and Links" section of this document):

- ERP material from other Federal agencies [for example, Incident Command System information from the Federal Emergency Management Agency (FEMA) and the Department of Homeland Security (DHS)];

- State ERP guidance;
- Risk Management Plans as required by the Clean Air Act section 112(r) (if applicable to your CWS);
- Water association ERP guides and training courses; and
- USEPA's Response Protocol Tool Box (for water contamination incidents) http://www.epa.gov/safewater/security/index.html#emergency.

Many of the above resources address specific topics or subject areas in greater detail than this guidance document. Again, the purpose of this guidance document is to help produce a single comprehensive ERP that would meet the response needs of a variety of events. Use ERP resources available to you to help build a single and comprehensive ERP that includes response actions to terrorist or other intentional events.

II. Emergency Response Plan—Eight Core Elements

What does USEPA mean by "ERP core elements"?

Core elements form the basis, or foundation, for responding to any major event. USEPA has identified eight core elements common to an ERP that you should plan to utilize or bring to bear during water emergencies.

1. System Specific Information;
2. CWS Roles and Responsibilities;
3. Communication Procedures: Who, What, and When;
4. Personnel Safety;
5. Identification of Alternate Water Sources;
6. Replacement Equipment and Chemical Supplies;
7. Property Protection; and
8. Water Sampling and Monitoring.

If you already have an ERP in place and just need to revise it, use the following sections to check if you are missing any key information. If you are just beginning to develop your ERP, use the following sections as a general template for what should be included in your ERP. Use the following sections to develop or revise your ERP according to your needs.

A. System Specific Information (Element 1)

Why do I need to keep system-specific information on hand?

During a major event, you need to have basic technical information readily available for your personnel, first responders, repair contractors/vendors, the media, and others. The information needs to be clearly documented and readily accessible so your staff can find and distribute it quickly to those who may be involved in responding to the major event. The location of critical documents, such as distribution maps, detailed plan drawings, site plans, source water locations, and operations manuals, should be identified and readily available during a major event. You should have located and reviewed much of this information while conducting your VA, so the ERP should only need to identify it.

What basic information do I need to have?

Basic information that may be presented in an ERP includes:

1. Public Water System (PWS) ID, Owner, Administrative Contact Person, Alternate Administrative Contact Person;
2. Population Served and Service Connections;
3. Distribution Map;
4. Pressure Boundary Map;
5. Overall Process Flow Diagrams;
6. Site Plans and Facility "As-Built" Engineering Drawings
    a) Pumping and Storage Facilities
    b) Reservoirs and Retention Facilities
    c) Water Treatment Facilities
    d) Booster Pump Stations
    e) Pressure-Regulating Valve (PRV) Sites
    f) Distribution System Process and Instrumentation Diagrams (P&ID)
    g) Equipment and Operations Specifications
    h) Emergency Power and Light Generation
    i) Maintenance Supplies
7. Operating Procedures and System Descriptions including back-up systems and interconnections with other systems;
8. Supervisory Control and Data Acquisition (SCADA) System/Process Control Systems Operations;
9. Communications System Operation;
10. Site Staffing Rosters and Employees' Duties and Responsibilities; and
11. Chemical Handling and/or Storage Facilities and Release Impact Analyses (i.e., chemical releases into air or water).

It is important to note that not all of this technical information may be needed to document how you operate. The level of technical documentation should reflect the complexity of your CWS.

B. CWS Roles and Responsibilities (Element 2)

What roles and responsibilities do I need to define?

You should designate an Emergency Response Lead (ER Lead) and Alternate ER Lead. The ER Lead will be the main point of contact and decision-maker during a major event. This person will have responsibility for evaluating incoming information, managing resources and staff, and deciding on appropriate response actions. This person will also have the responsibility of coordinating emergency response efforts with first responders. The ER Lead should be heavily involved in forming the partnerships described in Section I, "Before You Begin Developing or Revising Your ERP."

You should also identify an Alternate ER Lead who would step in should the ER Lead be unavailable. The ER Lead and the Alternate ER Lead need to be reachable 24 hours a day, seven days a week. A clear chain of command, or command structure, should also be established so that personnel and staff know their individual roles and responsibilities. If you have the resources and staff, you may consider forming an ER team that uses a well-defined command structure. At a minimum, your ERP should include the following basic information:

Name of ER Lead		Name of Alternate ER Lead	
Work Telephone No.		Work Telephone No.	
Home Telephone No.		Home Telephone No.	
Cell Phone No.		Cell Phone No.	
Pager No.		Pager No.	
Radio Call No.		Radio Call No.	

I saw a reference to a Water Utility Emergency Response Manager (WUERM) in another USEPA document. What is a WUERM?

A WUERM is basically your ER Lead. An ER Lead can have a variety of titles but the basic role and responsibility of the ER Lead does not change. Do not get confused or bogged down with titles and terminology. The main contact person and decision-maker during a major event is the ER Lead, regardless of job title.

What is an Incident Command System (ICS)? Do I need to have ICS?

Briefly, ICS is the model tool for command, control, and coordination of an emergency response and provides a means to coordinate the efforts of first responders as they work toward the common goal of stabilizing a major event and protecting life, property, and the environment. ICS uses a well-defined command structure in order to specify roles and responsibilities in responding to a major event. In ICS, the main contact person and decision-maker is the Incident Commander. At the CWS level, the ER Lead has the role of Incident Commander, unless the incident is of such significance that local, State, or Federal officials take over the command. You could use ICS to help organize yourself and your ER team, whether the team consists of staff from your CWS or other emergency responders. You do not need to have a complex command structure in place, but one that reflects your capabilities and also works effectively.

First responders may use ICS when responding to a major event. Your State may also have adopted ICS to respond to major events, and you may be required to abide by this command structure. If you are not required to use ICS, you should be familiar with ICS terms and command structure at a minimum. Other first responders may take over the role and responsibilities of Incident Commander in the latter stages of a major event, and you should know how this affects your role and responsibilities. You (or more appropriately the ER Lead) should address roles, responsibilities, and the command structure when forming the partnerships described in Section I, “Before You Begin Developing or Revising Your ERP.”

More information on ICS can be obtained from FEMA at http://training.fema.gov/EMIWeb/IS/is195.asp. Federal departments and agencies use an ICS under the National Incident Management System (NIMS)(http://www.dhs.gov/dhspublic/interweb/assetlibrary/NIMS-90-web.pdf).

C. Communication Procedures: Who, What, and When (Element 3)

What communication procedures do I need to have in place?

Appropriate and timely communication is essential during an emergency. The ERP should identify clear communication channels for CWS staff and personnel, external non-CWS entities, and the public/media. As part of your ERP, you should maintain internal and external notification lists that contain information on all appropriate entities to be contacted, including their names, titles, mailing addresses, e-mail addresses, all applicable land line and cellular phone numbers, and pager numbers. These lists should

be updated as necessary. In a major event (e.g., a terrorist attack), it may not be possible to use normal channels of communication. Provisions need to be made for an efficient and fail-safe form of communication to be available during conditions when the use of normal means may not be possible. Communication procedures with the public and media may already be part of your day-to-day operations, but these procedures need special attention during a major event in order to provide the public and media with timely, accurate, and complete information.

1. Internal Notification List

Who should be on my internal notification list?

The ER Lead and the Alternate ER Lead should be the first persons notified, because responding to a major event is their primary responsibility. If you have an ER team, then team members should be notified as well. Your ER team should consist of essential CWS personnel to be notified during an emergency. You should notify CWS management. Your internal notification list also should clearly identify all appropriate staff and personnel to be notified. Internal notification lists should include the name of the employee, work and home telephone numbers, and any other numbers at which the employee can be reached, such as cell phone, pager, or radio phone.

2. External Non-CWS Notification List

Who should be on my external non-CWS notification list?

Your external non-CWS notification list should ensure that all appropriate first responders and affected customers or critical users are notified. Procedures should also be established as to who should be notified, when they should be notified, and who is responsible to make the notifications from your CWS.

Below is a short list of possible first responders. These organizations are not listed in any particular order of preference.

- ❑ Local
  - Local 911
  - Police
  - Fire
  - Local Emergency Planning Committee (LEPC)
  - Elected Officials
  - Power Utility
  - Hazardous Materials (HAZMAT) personnel
- ❑ State
  - Drinking Water Primacy Agency
  - Department of Health
  - State 24-hr Emergency Communications Center Telephone
  - State Office of Homeland Security
  - HAZMAT
  - State Police
- ❑ Federal
  - FBI
  - EPA Headquarters and Regional Office
  - Department of Homeland Security (DHS)
  - Department of Health and Human Services (HHS)
  - National Response Center (800-424-8802, http://www.nrc.uscg.mil/)
- ❑ Other
  - Water Information Sharing & Analysis Center (http://www.waterisac.org/)

When you are identifying the list of groups to be notified during a major event, critical users (e.g., hospitals) and commercial and industrial customers such as those that incorporate water into their product (e.g., bottling and canning companies), should also be considered. You should maintain a list of critical users as part of your ERP. Some of these users should be given priority notification due to their public health mission and because they may serve customers considered "sensitive sub-populations" (e.g., senior residential housing, child care centers, medical facilities). Specific notification procedures should be developed for these groups.

3. Public/Media Notification: When and How to Communicate

What special items or issues do I need to consider when communicating with the public and media?

Effective public and media communications is a key element of your ERP. You should designate in advance who the CWS spokesperson will be during a major event. The spokesperson should be someone who is knowledgeable and credible, has good communication skills, and, if possible, is not a key person needed for implementing ERP response actions during the major event. In communicating with the media, the lead spokesperson may be someone external to the CWS if another organization has taken over the role of lead agency or Incident Commander (e.g., a representative from the health department or the State Drinking Water Primacy Agency). You should consider having both field and office staff respectfully defer questions to the designated spokesperson.

You can plan now for public and media notification needs by developing a communication plan or strategy for the spokesperson to follow. The communication plan or strategy should be a set of general guidelines for the spokesperson to follow in order to craft clear and concise messages for the public and to also deal with the media. The communication plan or strategy should be targeted to reach several audiences, such as your customers (both residential and business), local health professionals, and others. You can draft press releases and public water restriction notices in advance. The key to remember is that your message should be clear, accurate, and easily understood by your audience. Appendix A presents additional guidance on recommended communications plans or strategies.

D. Personnel Safety (Element 4)

Why do I need to address personnel safety in my ERP?

Protecting the health and safety of everyone in your CWS as well as the surrounding community is a key priority during an emergency. During an emergency, personnel may be at risk of harm, injury, or even death. This section of your ERP should provide direction personnel on how to safely implement a variety of response actions.

What procedures should the plan describe to provide for personnel safety?

When considering personnel safety the following factors should be taken into account:

- ***Evacuation Planning***: Develop a CWS evacuation policy and procedures.
- ***Evacuation Routes and Exits***: Designate primary and secondary evacuation routes and ensure that they are clearly marked, well lit, unobstructed at all times, and unlikely to expose evacuating personnel to additional hazards.

- ***Assembly Areas and Accountability***: Obtaining an accurate account of personnel requires planning and practice. Designate assembly areas where personnel should gather after an evacuation and specify procedures for taking a head count and identifying personnel.

- ***Shelter***: In some major events, the best means of protection is to take shelter (also known as shelter in place) either within the CWS or away from the CWS in another building.

- ***Training and Information***: Train staff and personnel in evacuation, shelter, and other safety procedures.

- ***Emergency Equipment***: Consider developing written procedures for using and maintaining your emergency response equipment. This should apply to any emergency equipment relevant to a response involving a toxic chemical, including all detection and monitoring equipment, alarms and communications systems, and Personal Protective Equipment (PPE) not used as part of normal operations.

- ***First Aid***: Discuss proper first aid and emergency medical treatment for employees and others who are onsite at the CWS. This should include standard safety precautions for victims as well as more detailed information for medical professionals. Indicate also who is likely to be responsible for providing the appropriate treatment (i.e., an employee with specialized training or a medical professional).

Are there other sources of information that can help me with developing personnel safety procedures?

You should focus on standard Occupational Safety and Health Administration (OSHA), Spill Prevention Control and Countermeasures (SPCC), Risk Management Program (RMP), and State procedures to define your own personnel safety procedures. Your staff should understand when to evacuate, when and how to use PPE, and how to rapidly locate additional safety information, such as chemical-specific Material Safety Data Sheets (MSDS). You also could consult with other utilities and water organizations.

E. Identification of Alternate Water Sources (Element 5)

What should I consider when identifying alternate water sources in my ERP?

You should consider the amount of water needed to address short-term (hours to days) and long-term (weeks to months) outages. As part of your ERP, you should identify the alternate water supplies available to you during both types of outages. To do this, you need to have a comprehensive understanding of your current water supply, your water distribution system, and your water system demand requirements. You should clearly understand the location and capabilities of other regional CWS, including available excess capacity and ease of connection to your distribution system. In addition, you should also understand the interconnection agreements your partners have in place and potential issues that could arise if multiple CWS are affected. These are important issues that should be addressed when you are forming the partnerships described in Section I, “Before You Begin Developing or Revising Your ERP.”

What should I consider for short-term outages?

Short-term outages might be due to contamination or electrical power outages. If your CWS has been contaminated, a public health notification such as “boil water,” “do not drink,” or “do not use,” may be issued by the drinking water primacy agency. If a “boil water” notice is issued, no alternative water source is needed. If a “do not drink” order is issued, then the suspect water can still be used for other

activities that do not involve ingestion of the water. In this situation, it will only be necessary to provide an alternate drinking water supply for consumption and related activities such as food preparation.

A “do not use” order is much more restrictive. You will need sufficient alternate water sources to supply water for consumption, hygiene, and emergency needs. A “do not use” notice may also have implications with respect to water used for firefighting. Although a prohibition on use of water for firefighting is likely to occur only if the water is contaminated with certain substances, an alternate source of firefighting water, such as a pond, river, or stream, may be necessary in this event.

As part of your ERP, you should consider the potential effects of a power outage. Your utility could be without power due to a major event, and it may take several days for power to be restored. Your plan should include contingencies for back up power generation and alternative power sources.

As part of your ERP, you also should identify agencies or private companies that could provide water supplies (bottled or bulk) in the event of a major event and establish mutual aid agreements with surrounding communities, industries, contractors and related utilities as appropriate. Your source list should be maintained to include accurate information on points of contacts for the alternate sources. Possible short-term alternate water supply options include (but are not limited to) the following:

- Bottled water provided by outside sources;
- Bottled water provided by local retailers;
- Bulk water provided by certified water haulers;
- Bulk water transported or provided by military assets (i.e., National Guard or U.S. Army Corps of Engineers (USACE));
- Bulk water provided by neighboring water utilities by truck or via pipeline;
- Bulk water from hospitals, universities, and local industry that maintain backup water supplies for consumption;
- Interconnections with nearby public water systems;
- Water treated by plant and hauled to distribution centers (i.e., in the case of water distribution system contamination);
- Water pumped from surface water sources, treated at the plant or nearby plants, and hauled to distribution centers;
- Water for firefighting from Federal agencies such as the USACE and FEMA; and
- Water from unaffected wells owned by local citizens and businesses.

Additional equipment may be available from:

- Local businesses such as dairies, well drillers, irrigation supply firms, or distributors that may have tank trucks that can be made suitable for carrying water, chlorinators or generators that can be used for emergency disinfection, and pipe that can be used to extend water supply lines.
- Other water utilities in the area that may have spare parts (such as valves, pumps, and pipe) available for use in an emergency.
- FEMA, USACE, and the U.S. Forest Service that may be able to provide firefighting equipment.

You may also want to plan for water conservation measures to be used if a major event causes a reduction in service or a “do not use” notice is issued. For example, if a major event causes a reduction in service, you could limit water use by advising customers not to do laundry, run the dishwater, or water the garden and to limit the duration of showers. To plan for a “do not use” notice, you could advise consumers to maintain an emergency supply of water, such as keeping a certain amount of bottled water in their homes.

What should I consider for long-term water outages?

If your CWS will need extensive cleaning, or if portions of the system have been destroyed, you will need a long-term alternate water supply. The following are examples of possible long-term water supply options:

- Connection of the water distribution system to an existing municipal or private water supply (assumes existing water treatment plant and distribution system is intact and useable);
- Connection of the water distribution system with a new uncontaminated groundwater or surface water source (assumes existing water treatment plant and distribution system is intact and useable);
- Development of new water distribution system (assumes existing water treatment plant and source water is uncontaminated and useable); and
- Development of oversized community storage facilities to compensate for loss of existing system capacity.

F. Replacement Equipment and Chemical Supplies (Element 6)

What pieces of equipment and chemical supplies do I need to identify in my ERP?

Your ERP should identify equipment that can significantly lessen the impact of a major event on public health and protect the safety and supply of drinking water. You should maintain an updated inventory of:

- Current equipment (e.g., pumps);
- Repair parts;
- Chemical supplies for normal maintenance and operations; and
- Information on mutual aid agreements.

Based on the findings of your VA, you should identify how and where to find the equipment, repair parts, and chemicals that you would need to respond adequately to a particular vulnerability. You should consider establishing mutual aid agreements with other CWS to address any deficiencies. These agreements should identify the equipment, parts, and chemicals available to you under the agreement.

G. Property Protection (Element 7)

Why do I need to address property protection in my ERP?

Protecting CWS facilities, equipment and vital records is essential to restoring operations once a major event has occurred. Your ERP should identify measures and procedures that are aimed at securing and protecting your CWS following a major event. Items that should be considered include:

- “Lock down” procedures;
- Access control procedures;
- Establishing a security perimeter following a major event;
- Evidence protection measures for law enforcement (should the major event also be declared a crime scene);
- Securing buildings against forced entry; and
- Other property protection procedures and measures.

H. Water Sampling and Monitoring (Element 8)

What water sampling and monitoring issues do I need to address in my ERP?

Water sampling and monitoring should be an integral part of your ERP and not an afterthought. How else can you determine whether the drinking water that you supply is safe for public consumption and use? During the stage of forming partnerships described in Section I, "Before You Begin Developing or Revising Your ERP," you should consult with your State Drinking Water Primacy Agency on the issues of water sampling and monitoring. In your ERP you will need to identify and address special water sampling and monitoring issues that may arise during and after a major event. Some water sampling and monitoring issues to consider include:

- Identifying proper sampling procedures for different types of contaminants;
- Obtaining sample containers;
- Determining the quantity of required samples;
- Identifying who is responsible for taking samples;
- Identifying who is responsible for transporting samples (in time sensitive situations);
- Confirming laboratory capabilities and certifications; and
- Interpreting monitoring or laboratory results.

For a more detailed discussion on water sampling and monitoring issues, please see USEPA's Response Protocol Tool Box Module 3, "Site Characterization and Sampling Guide" (EPA-817-D-03-003) at http://www.epa.gov/safewater/security/pdfs/guide_response_module3.pdf and Module 4, "Analytical Guide" (EPA-817-D-03-004) at http://www.epa.gov/safewater/security/pdfs/guide_response_module4.pdf

III. Putting Your ERP Together and ERP Activation

A. Putting All Your Core ERP Elements Into a Single Comprehensive Plan

I have addressed all my core ERP elements. What do I do next?

You now want to organize and document all the information that you gathered or produced while addressing your core ERP elements. Your goal is to produce a single comprehensive ERP document that is accessible to appropriate personnel, and that can be updated or modified as the need arises. Your ERP document may be organized into:

- Overall ERP polices;
- General ERP procedures;
- Any mutual aid agreements;
- Reference documents; and
- Action Plans (see Section IV, "Action Plans," for more details).

How you ultimately organize and document your ERP is up to you and can depend on whether you are developing an ERP from scratch, or are revising an existing ERP. Other Federal and State requirements may also influence how you organize and document your ERP. The Bioterrorism Act requires that you maintain a copy of your ERP for five years after you have sent your ERP certification to USEPA (see also Section V, "Next Steps"). A secure copy of your ERP should also be maintained in an off-premises location in the event that your copy cannot be accessed.

B. ERP Activation

What is "ERP Activation" and why is it important?

Knowing when to activate or set your ERP in motion is as important as having a prepared and documented ERP. In the past, emergency response mostly dealt with emergencies such as natural disasters and accidents. The definition of a "major event" in this guidance includes a major disaster or other emergency as well as a terrorist attack. Being prepared to respond to a terrorist attack requires special attention. This section discusses ways in which you may learn about a threat, the threat decision process, and activation of your ERP.

What things should I pay special attention to before activating my ERP?

You should pay attention to any "threat warning." The Homeland Security Advisory System shown in **Figure III-1** contains five threat condition levels. Low Condition (Green) is declared when there is a low risk of terrorist attacks. Guarded Condition (Blue) is declared when there is a general risk of terrorist attacks. Elevated Condition (Yellow) is declared when there is a significant risk of terrorist attacks. High Condition (Orange) is declared when there is a high risk of terrorist attacks. Finally, Severe Condition (Red) reflects a severe risk of terrorist attacks. EPA has issued supplemental guidance for water utilities to increase security based on threat conditions described by the five-tiered Homeland Security Advisory System (see Appendix B).



Figure III-1. Threat Condition Levels

A "threat warning" is an occurrence or discovery that indicates a threat of a malevolent act and triggers an evaluation of the threat. These warnings should be evaluated in the context of typical CWS activity and previous experience in order to avoid false alarms. The threat warnings presented in **Figure III-2** and described below are intended to be inclusive of those most likely to be encountered, but this listing is by no means comprehensive of all possibilities.

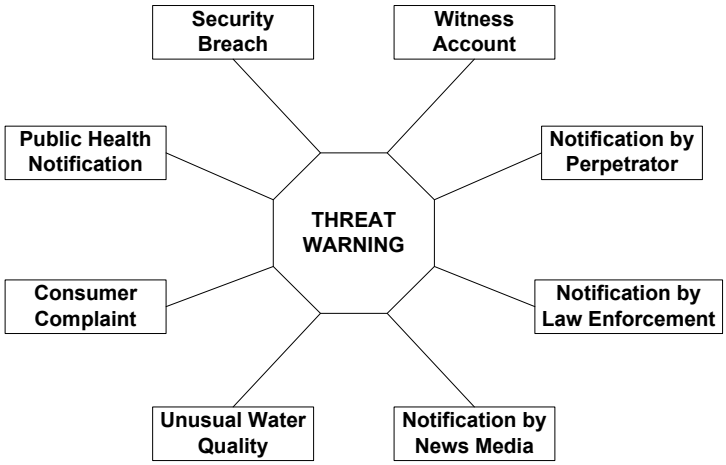


Figure III-2. Summary of Potential Threat Warnings

- ***Security Breach***. Physical security breaches caused by lax operations such as unsecured doors or criminal acts such as trespassing are probably the most common threat warnings.

- ***Witness Account***. You or your neighbors may see suspicious activity, such as trespassing, breaking and entering, and other types of tampering.

- ***Notification by Perpetrator***. A threat may be made directly to you, either verbally or in writing. Historical incidents indicate that verbal threats made over the phone are more common than written threats.

- ***Notification by Law Enforcement***. You may receive notification about a threat directly from law enforcement, whether it is county, local, State, or Federal. Such a threat could be a result of a report of suspicious activity or through information gathered by law enforcement.

- ***Notification by News Media***. A threat might be delivered to the news media, or the media may discover a threat. A conscientious reporter would immediately report such a threat to the law enforcement and either the reporter or law enforcement would immediately contact the CWS.

- ***Unusual Water Quality***. You should investigate possible causes of unusual water quality (i.e., changes from baseline). You want to rule out unusual results that can be explained or those that are due to known causes.

- ***Consumer Complaint***. An unexplained or unusually high incidence of consumer complaints about the aesthetic qualities of drinking water may indicate a potential threat. Many chemicals can impart a strong odor or taste to water, and some may discolor the water.

- ***Public Health Notification***. The first indication that a water-related incident has occurred may involve victims showing up in local emergency rooms and health clinics. An incident triggered by a public health notification is unique in that at least a segment of the population has been exposed to a harmful substance.

What do I do once I discover a threat warning?

Once a threat warning is received, the threat decision (or threat evaluation) process begins. The ER Lead or Alternate ER Lead should be notified immediately because they will be involved in this decision process and make decisions about who else (e.g., other emergency responders) should be involved. The threat decision process is considered in three successive stages: 'possible', 'credible', and 'confirmed'. As the situation escalates through these three stages, the actions that might be considered also change. The following describes the stages, actions that might be considered, and activation of your ERP.

- **Stage 1: "Is the threat 'possible'?"** If you are faced with a threat, you should evaluate the available information to determine whether or not the threat is possible (i.e., could something have actually happened?). If the threat is possible, immediate operational response actions might be implemented. Knowing the findings from your VA could help you determine whether a certain threat is possible or not.

- **Stage 2: "Is the threat 'credible'?"** There must be information to corroborate the threat in order for it to be considered credible. For example, your information source may be highly credible, hospitals may be reporting a potential incident, or your may have monitoring results that are unusual. At this stage, you may activate additional portions of your ERP, such as initiating internal and external notifications, conducting water sampling and analysis, or issuing public health advisories. At this stage, you're not sure whether a major event has occurred but are preparing to respond should the threat actually lead to a major event.

- **Stage 3: "Has the incident been 'confirmed'?"** Confirmation implies that definitive evidence and information has been collected to establish that an incident has occurred. Confirmation of an incident may be obvious, such as structural damage to a CWS; in such a case, Stages 1 and 2 would be omitted. Upon confirmation of the incident, you should fully implement your ERP. Your ERP should contain Action Plans (see Section IV) that address specific major events, and these Action Plans should be implemented immediately.

The application of this threat decision process will vary significantly with the circumstances. The ER Lead should work through the threat decision process and implement the ERP as needed. In summary, judgment must be exercised when determining how to appropriately manage a specific threat or incident.

IV. Action Plans

What are Action Plans?

Action Plans (APs), also known as Response Guidelines, are tailored ERPs that address specific major events. APs describe response actions to take for events that you think might occur at your facility based on the specific vulnerabilities identified in your VA.

An AP should provide a quick approach for responding to a specific major event and it complements actions already initiated under the ERP. You may only need one to two pages to cover specific response information since you have already addressed basic emergency response steps in the core elements of your ERP. An AP should be an accessible (i.e., "rip and run") document that can be detached and taken to the field by the ER Lead or Alternate ER Lead. An AP should include the following basic information:

- Any special notification requirements;
- Special response steps to be taken upon ERP activation; and
- Recovery actions to bring the CWS back into operation.

A. Response to Vulnerability Assessment Findings

How do I go about developing Action Plans for my VA findings?

The Bioterrorism Act requires that prepared or revised ERPs incorporate the results of completed VAs. During the VA process, you should have determined your high priority vulnerabilities. An Action Plan defines the specific actions you would take to respond to events where your high priority vulnerabilities have been compromised. In addition, we recommend that you develop APs for certain high consequence events regardless of whether these are among your high-priority vulnerabilities. Events and threats of events that should be considered in APs include the following:

- Contamination of the Drinking Water;
- Structural Damage/Physical Attack;
- SCADA, Computer, or Cyber Attack; and
- Intentional Hazardous Chemical Release (e.g., release of chlorine or ammonia from storage).

Even if your VA did not identify any vulnerabilities, you are encouraged to consider contingency planning for the possibility of these events.

Example Action Plans for the four intentional events listed above are included in Appendix C. Each AP goes through the threat decision process described in Section III.B, "ERP Activation." It should be noted

that these simplified examples are for discussion purposes only and that you should develop "Action Plans" specific to the needs of your water system and surrounding community. You also could consult EPA's Response Protocol Toolbox, http://www.epa.gov/safewater/security/index.html#emergency, as an aid in developing APs for contamination events.

So, what about all of the sensitive information in my Action Plans referring to my vulnerabilities?

APs should be easily accessible to authorized personnel and should be easily identifiable during a major event. However, you may want to limit access to APs containing sensitive information and specifics related to intentional events. Again, steps taken to limit such access should consider local and state Freedom of Information Act (FOIA) laws. Alternatively, you can opt to make your APs general in nature so that everyone can use them and place sensitive information in the ERP appendices, or in sections that are not readily available to unauthorized personnel.

B. Natural Disasters and Other Significant Events

How should my ERP deal with natural disasters and other emergencies?

If you already have an ERP in place to address other major events, you may want to tailor response actions in light of discussions in this section. You may wish to develop individual Action Plans for other major events that are not terrorist-related. A similar approach to that described above could be used to plan for natural disasters and other significant events. Natural disasters and other significant events include:

- Fire;
- Flood;
- Hurricane and/or Tornado;
- Severe Weather (snow, ice, temperature, lightning, drought);
- Earthquake;
- Electrical Power Outage;
- Mechanical Failure;
- Water Supply Interruption;
- Contaminated Water Treatment Chemicals;
- Accidental Hazardous Chemical Spill/Release;
- Construction Accidents;
- Personnel Problems (Loss of operator, medical emergencies);
- Vandalism; and
- Unintentional Contamination of the Water Supply (e.g., waterborne disease outbreak, accidental cross connections, etc.).

V. Next Steps

What do I do once my ERP is completed or revised?

Once you prepare or revise your ERP, you are required under the Bioterrorism Act to submit a written certification stating that the plan has been completed by a certain deadline date. (Do not submit a copy of the ERP to EPA.) USEPA has produced a separate document that addresses ERP certification submittal entitled *Instructions to Assist Community Water Systems in Complying with The Public Health Security and Bioterrorism Preparedness and Response Act, Title IV*. Please consult this document to answer your specific questions about submittal procedures and deadline dates. This document can be

found at http://www.epa.gov/safewater/security/community.html. A copy of the ERP certification is presented at the end of this section.

Additionally, as required under Section 1433(c) of the Bioterrorism Act you must maintain a copy of your ERP for five (5) years after you submit your ERP certification to USEPA.

Where do I send my signed ERP Certification?

We recommend that you submit the ERP certification using an express or courier service such as Federal Express, United Parcel Service, Airborne, etc., which provides tracking and certification of delivery. Using one of these services will ensure that the submission is delivered directly to the persons authorized to receive and process these items.

Use the following address for express or courier service deliveries to USEPA. This location is open for deliveries between 8:30am and 4:30pm Eastern Time. Call the number under the address below before attempting delivery outside of those hours.

U.S. Environmental Protection Agency
Water Resource Center (WSD-RAR)
Room 1119 EPA West Building
1301 Constitution Ave., NW
Washington DC 20004

Couriers are to use phone number 202-566-1729.

As stated above, more detailed guidance on preparing and submitting the ERP certification can be found at http://www.epa.gov/safewater/security/community.html.

What additional State requirements must I meet?

Depending on your State, you may be required to provide a copy of your ERP to State authorities or certify that you have completed or revised your ERP. You should coordinate with your State Drinking Water Primacy Agency to determine what requirements apply to your CWS.

When should I update my ERP?

It is important to note that an ERP is a "living" document that you should update periodically (i.e., at least annually or if there is a major change to your CWS configuration). The ER Lead and appropriate CWS management staff should approve the ERP and identify the time period for routinely updating the ERP (e.g., annually). Updates should occur if there are changes in CWS staff, internal and external contacts, roles and responsibilities of anyone involved in response, or there are changes made in infrastructure.

If you update your ERP, you are not required to resubmit a written ERP certification to the USEPA.

What type of training is appropriate?

You should make sure that your staff is trained on their ERP responsibilities. Training can include briefing sessions, classroom sessions, or mock exercises. You should also remember to do "refresher" training on a regular basis. Training should include testing of the ERP. Drills and exercises that challenge the information in the ERP should be conducted at least annually. There are many sources (State, Federal, and industry specific) that describe what should be included in emergency training. These typically include the following four types of training:

- **Orientation Sessions**: Orientation sessions work well for basic instruction and explaining ERP procedures. Written tests may be employed to ensure some level of comprehension by the attendees.

- **Table-Top Workshop**: Table-top workshops involve developing scenarios that describe potential problems and provides certain information necessary to address the problems. The idea is to present staff and emergency response officials with a fabricated event, have them verbally respond to a series of questions, and then evaluate whether the responses match what is written in the ERP.

- **Functional Exercises**: The Functional Exercise is considered the most effective training tool, next to a real emergency, because a team of simulators is trained to develop a realistic major event. By using a series of pre-scripted messages, the simulation team sends information in to personnel assigned to carry out the ERP procedures. Both the simulators and personnel responding to the simulation are focused on carrying out the procedures to test the validity of the ERP.

- **Full Scale Drills**: These are the most costly and time-consuming training programs but can be extremely effective. In a full-scale drill, emergency response personnel and equipment are mobilized to a scene, an emergency scenario is presented, and they respond as directed by the ERP.

The bottom line is that time, resources, and personnel need to be dedicated to accomplishing the training. Use the training to identify lessons learned, debrief staff of lessons learned to enhance future response and recovery efforts, and update plans to incorporate lessons learned.

Reproduction of ERP Certification

CERTIFICATION OF COMPLETION
OF AN EMERGENCY RESPONSE PLAN

Public Water System ID number:_____

System Name:_____

City where system is located:_____

State :_____

Printed Name of Person Authorized to Sign
this Certification on Behalf of the System:_____

Title:_____

Address :_____

City:_____

State and ZIP Code:_____

Phone:_____**Fax:**_____**Email:**_____

I certify to the Administrator of the U.S. Environmental Protection Agency that this community water system has completed an Emergency Response Plan that complies with Section 1433(b) of the Safe Drinking Water Act as amended by the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Public Law 107-188,Title IV — Drinking Water Security and Safety).

I further certify that this document was prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information (Safe Drinking Water Act (42 U.S.C.300f *et seq.*)).

The emergency response plan that this community water system completed incorporates the results of the vulnerability assessment completed for the system and includes "plans, procedures, and identification of equipment that can be implemented or utilized in the event of a terrorist or other intentional attack " on this community water system. The emergency response plan also includes "actions, procedures, and identification of equipment which can obviate or significantly lessen the impact of terrorist attacks or other intentional actions on the public health and the safety and supply of drinking water provided to communities and individuals."

This CWS has coordinated, to the extent possible, with existing Local Emergency Planning Committees established under the Emergency Planning and Community Right-to-Know Act (42 U.S.C.11001 et seq) when preparing this emergency response plan.

Signed:_____ **Date:**_____

Primary contact person that EPA can call if there are questions about this Certification:

Name:_____

Address (if different than that of the Authorized Representative):_____

_____

Phone:_____

Email Address:_____

Alternate Contact Person:

Name:_____

Address (if different than that of the Authorized Representative): _____

_____

Phone:_____

Email Address:_____

References and Links

The following is a list of references and Internet links that may be useful to you in preparing your Emergency Response Plan.

Department of Homeland Security (DHS): DHS is the overall lead agency for homeland security issues. DHS will become involved in incident response if needed. General information about DHS is available at http://www.dhs.gov/dhspublic. DHS administers the National Incident Management System (NIMS), which provides a nationwide template to enable Federal, State, local, and tribal governments and private-sector and nongovernmental organizations to work together to prepare for, prevent, respond to, and recover from domestic incidents, including terrorism. Information on the NIMS can be found at http://www.dhs.gov/interweb/assetlibrary/NIMS-90-web.pdf.

Environmental Protection Agency: EPA has numerous resources available in addition to this guidance. The following are key sources:

- Water Infrastructure Security information, guidance, and training information can be found at http://www.epa.gov/safewater/security/index.html.
- More information on Local Emergency Planning Committees (LEPCs) can be found at http://www.epa.gov/ceppo/lepclist.htm.

The Center for Disease Control and Prevention (CDC): The CDC develops resources to assist hospital staff, clinics, and physicians in diagnosing diseases related to terrorism, reporting incidences of disease, and controlling the spread of infection. Information on emergency preparedness and response can be found at http://www.bt.cdc.gov.

- To assist in the development of a Public Health Response Plan, the CDC published a planning document entitled *The Public Health Response to Biological and Chemical Terrorism: Interim Planning Guidance for State Public Health Officials (July 2001)*, which can be found at http://www.bt.cdc.gov/Documents/Planning/PlanningGuidance.pdf.
- *Interim Recommended Notification Procedures for Local and State Public Health Department Leaders in the Event of a Bioterrorist Incident* can be found at http://www.bt.cdc.gov/EmContact/Protocols.asp.

Federal Emergency Management Agency (FEMA): On March 1, 2003, FEMA became part of the U.S. Department of Homeland Security. FEMA's mission is to reduce loss of life and property and protect our nation's critical infrastructure from all types of hazards through a comprehensive, risk-based, emergency management program of mitigation, preparedness, response and recovery. General information can be found at http://www.fema.gov. In addition, several online training courses relevant to emergency management are available on-line from FEMA at http://training.fema.gov/EMIWeb/IS/crslist.asp.

The American Water Works Association (AWWA): EPA training developed through partnership with AWWA covers security issues including assessing vulnerabilities, emergency response plans and risk communication. AWWA information can be accessed at their website, http://www.awwa.org. Specific AWWA resources can be found at http://www.awwa.org/communications/offer/secureresources.cfm.

The Association of State Drinking Water Administrators (ASDWA): ASDWA has information on water security planning, training, and links to State programs and other information sources. Go to the security link at http://www.asdwa.org.

National Rural Water Association (NRWA): NRWA developed the "Security and Emergency Management System" (SEMS) Software Program, which can be loaded on a personal computer. It is based on NRWA/ASDWA's *Security Vulnerability Self-Assessment Guide for Small Drinking Water Systems Serving Populations Between 3,300 and 10,000*. You can find more information at http://www.nrwa.org.

Glossary

Definitions in this glossary are specific to the Emergency Response Plan Guidance but have been conformed to common usage as much as possible.

Action Plans: specific plans designed to be used during the response to a threat or incident. Action plans should be easy to use and contain forms, flow charts, and simple instructions to support staff in the field or decision officials during management of a crisis.

Bioterrorism Act: the Public Health Security and Bioterrorism Preparedness and Response Act of 2002.

Chain of Command: a clear and definitive structure of authority.

'Confirmed': a stage in the threat evaluation process in which there is definitive evidence and information to establish that an incident or major event has occurred.

'Credible': a stage in the threat evaluation process in which there is information to corroborate a threat.

Drinking Water Primacy Agency: the agency that has primary enforcement responsibility for national drinking water regulations, namely those promulgated under the Safe Drinking Water Act as amended. Drinking water primacy for a particular State may reside in one of a variety of agencies such as the State Health Agency, the State Environmental Agency, or the USEPA regional office.

Emergency Response (ER) Lead: the pre-designated main point of contact and decision-maker for a CWS during a major event.

Incident Command System: a standardized on-scene emergency management concept specifically designed to allow its user(s) to adopt an integrated organizational structure equal to the complexity and demands of single or multiple incidents, without being hindered by jurisdictional boundaries.

Jurisdiction: the range or sphere of authority. Public agencies have jurisdiction at an incident related to their legal responsibilities and authority for incident mitigation. Jurisdictional authority at an incident can be political/geographic (e.g., city, county, State, or Federal boundary lines) or functional (e.g., police department, health department, etc.).

Local Emergency Planning Committee (LEPC): established by the Emergency Planning and Community Right-to-Know Act, LEPCs have the job of increasing community hazardous materials safety through public education, emergency planning, responder training, conducting exercises, and reviewing actual responses to releases.

Major Event: a domestic terrorist attack, major disaster, or other emergency (from Homeland Security Presidential Directive/HSPD-8) (http://www.whitehouse.gov/news/releases/2003/12/20031217-6.html)

Notification: the process of communicating information to interested parties.

Personal Protective Equipment (PPE): equipment and supplies designed to protect employees from serious injuries or illnesses resulting from contact with chemical, radiological, biological, or other hazards. PPE includes face shields, safety glasses, goggles, laboratory coats, gloves, and respirators.

'Possible': a stage in the threat evaluation process in which available information indicates there is an opportunity for an incident (i.e., the threat is possible).

Response Decisions: part of the threat management process in which decisions are made regarding appropriate response actions that consider 1) the conclusions of the threat evaluation, 2) the consequences of the suspected incident, and 3) the impacts of the response actions on drinking water customers and the utility.

Security Breach: an unauthorized intrusion into a secured facility that may be discovered through direct observation, an alarm trigger, or signs of intrusion (e.g., cut locks, open doors, cut fences). A security breach is a type of threat warning.

Spokesperson: the individual responsible for interfacing with the public and media or with other agencies requiring information directly from the incident. Under the ICS, there is only one spokesperson per incident.

Technical Assistance Provider: any organization or individual that provides assistance to drinking water utilities in meeting their mission to provide an adequate and safe supply of water to their customers.

Threat: an indication of possible violence, harm, or danger.

Threat Evaluation: part of the threat management process in which all available and relevant information about the threat is evaluated to determine if the threat is 'possible' or 'credible', or if an incident has been 'confirmed.' This is an iterative process in which the threat evaluation is revised as additional information becomes available. The conclusions from the threat evaluation are considered when making response decisions.

Threat Warning: an occurrence or discovery that indicates a threat of a malevolent act and triggers an evaluation of the threat.

Vulnerability Assessment (VA): a systematic process for evaluating the susceptibility of critical facilities to potential threats and identifying corrective actions that can reduce or mitigate the risk of serious consequences associated with these threats.

Appendix A: Public Communications Strategy

Developing a Public Communications Strategy

Developing a public communications strategy will prepare you to effectively communicate with the public and media at the time of an emergency or crisis. As a CWS, you should remember that any public notification or communication will have an immediate and direct impact on your customers and consumers. Consumers may be instructed to boil water, limit their water uses to activities that do not involve consumption, or not use the water at all. A good public communications strategy will help you get your message out effectively and outline who needs to do what and when. Items that should be considered in a public communication strategy include:

- Designating a spokesperson and any alternate spokespersons (should the main spokesperson be unavailable);
- Organizing basic facts about the CWS and the situation the CWS is facing;
- Having a method in place to develop key messages to use with the media that are clear, brief, and accurate;
- Making sure the messages are carefully planned and have been coordinated with other appropriate officials and organizations;
- Making sure the messages are targeted to reach different audiences such as residential and business customers, local health professionals, etc.; and
- Having methods in place for delivering messages;
- Determining how to reach the largest number of customers and key stakeholders by selecting delivery methods that are likely to produce the best results. The reach and impact of the message and information will increase if the same message is distributed via different delivery methods more than one time.

While it may seem that developing a public communications strategy may be a lot of work and effort, you should already have experience with public and media communication through your compliance with the public notification requirements of the 1996 Safe Drinking Water Act (SDWA) amendments. In fact, many of the suggestions found in this appendix on developing and implementing a public communication strategy are excerpts from the "Public Notification Handbook" (EPA 816-R-00-010, 2000) (http://www.epa.gov/safewater/pws/pn/handbook.pdf). For example, the sample public notices shown on the following pages are taken from the handbook. Additionally, other publications and tools are available that can assist you in developing and implementing a public communications strategy not only in response to major events, but also in improving your public and media communications in general.

Making Public and Media Communications Work

Making public and media communications work involves implementing your public communications strategy effectively. This takes practice and a lot of work BEFORE any notice or communication is issued. Below are some tips and suggestions that would help make your public communications strategy work. Please note that these tips and suggestion are not all inclusive. Many are taken directly from USEPA's "Public Notification Handbook" (EPA 816-R-00-010, 2000).

Communication Tips and Suggestions:

- Any decision to issue a public notification should be made in consultation with your Drinking Water Primacy Agency. You also should make arrangements with your local health department and/or other appropriate organizations prior to a major event in order to establish clear lines of communication and ensure access to decision officials on a 24/7 basis.
- Typical press releases and notices should be ready beforehand to save hours of time and possibly prevent serious health problems for water users. In your press release or notice you should explain to the media what information you are trying to communicate and why. The most important

information, including a description of the situation, populations at risk, instructions to consumers, and potential health effects, should be near the beginning of any press release or notice. Be sure to include a contact name and telephone number so that the media can call you for more information.

- ❑ Remember to avoid technical or confusing language in your press releases and notices.
- ❑ When you send a press release or notice to the media, write "PRESS RELEASE FOR PUBLIC SAFETY" at the top to emphasize its importance.
- ❑ Work with the media ahead of time and develop an ongoing relationship. Explain to them what constitutes a major event and what your needs will be during a crisis. Hold an annual media day where you can explain how your CWS operates, including any improvements you may be implementing. The more informed the members of the media are about your CWS then the more accurate and effective they are helping get your message out to the public. The box below provides some general tips when directly working with the media.
- ❑ Establish contacts with institutions and people who can translate press release and notices into other languages for you and who can help you target non-English speaking populations.
- ❑ If you are going to provide bottled water, you should confirm ahead of time and periodically reconfirm that available bottled water supplies meet the Food and Drug Administration or State safety standards.
- ❑ Consider beforehand which communication delivery methods would work best, particularly during a major event. Delivery methods during a major event could include:

  - Broadcast media (radio and television);
  - Government access channels;
  - Web site (local government and others);
  - Listserve e-mail;
  - Newspaper;
  - Phone banks;
  - Broadcast phone messages ("reverse 911" messaging);
  - Broadcast faxes;
  - Posting in conspicuous locations;
  - Mass distribution through partners (e.g., churches, retailers, restaurants);
  - Hand delivery;
  - Door-to-door canvassing; and
  - Direct notification to critical users (e.g., schools, hospitals, nursing homes, prisons, etc.).

General Tips on Working with the Media

- Be truthful and up-front.
- Answer questions as well as you can, but don't be afraid to say that you need to check on something if there is a question you can't answer (once you find the information, quickly report back on what you've found).
- Keep in mind that reporters are not familiar with State or Federal requirements for safe drinking water – avoid technical jargon!
- Provide additional sources of information (for instance, referrals to State contacts).
- Be sensitive to the fact that reporters may be working on tight deadlines.
- Provide a list of the elements that should be addressed.
- Don't be upset if a newspaper article or news report isn't exactly as you would want it, but politely tell a reporter if a significant piece of information is wrong or missing.
- Don't be defensive when answering questions.

Example Boil Water Notice

WARNING

BOIL YOUR WATER BEFORE USING

[The Holly County Water System] water is contaminated with [fecal coliform/E. coli]

[Fecal coliform or E. coli] bacteria were found in the water supply on [November 5]. These bacteria can make you sick and are a particular concern for people with weakened immune systems.

What should I do?

- DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST. Bring all water to a boil, let it boil for ten minutes, and let it cool before using, or use bottled water. Boiled or bottled water should be used for drinking, making ice, brushing teeth, washing dishes, and preparing food until further notice. Boiling kills bacteria and other organisms in the water.

- Fecal coliform and E. coli are bacteria whose presence indicates that the water may be contaminated with organisms that can cause illness in humans. These organisms can cause diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, some of the elderly, and people with severely compromised immune systems.

- Organisms in drinking water are not the only cause of the symptoms above. If you experience any of these symptoms and they persist, you may want to seek medical advice. People at increased risk should seek advice about drinking water from their health care providers.

What happened? What is being done?

The water distribution system was contaminated with fecal coliform. We are working with law enforcement and the public health department to investigate/resolve this issue. We are currently increasing the chlorination levels at the treatment plant as well as at the chlorine booster stations throughout the system. In addition, we are evaluating all available information and conducting tests to confirm the extent of the contamination of the system. We will inform you when tests show no bacteria and you no longer need to boil your water. We anticipate resolving the problem within the next 48 hours.

For more information, please contact [Joseph Smith] at [555-555-6789]. General guidelines on ways to lessen the risk of infection by microbes are available from the EPA Safe Drinking Water Hotline at 1-800-426-4794 and [the Public Health Department Hotline at 1-800-123-4567].

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand.

This notice is being sent to you by [Holly County Water System]. State Water System ID# [10001]. Date distributed: [November 6, 2003]

Example Do Not Drink Notice

WARNING

DO NOT DRINK THE WATER

[Cyanide] found in the [City of Rolling Brook] water supply on [October 10th]

Bottled water can be obtained at [Islington Station High School and Penn Road High School 24 hours per day].

What should I do?

- Do NOT drink the water.
- Symptoms associated with cyanide include dry mouth, itchy throat, headache, sweating, flushed skin, muscle rigidity, fever, confusion, lethargy, seizures, loss of consciousness, coma, and death.
- If you or someone you know exhibits any of these symptoms, immediately contact your health care provider. In addition, please notify the public health department at 1-800-123-4567.

What happened? What is being done?

On October 10th, the water distribution system was contaminated with cyanide. We are working with law enforcement and the public health department to investigate/resolve this issue. We have tested the water in various parts of the distribution system to verify the extent of the cyanide contamination. Based on these tests, we have isolated the portion of the system located north of Aspen Street and east of River Road. Everyone in this portion of the system **should not drink the water**. We have implemented additional security procedures to protect the system against further contamination. Additional information will be provided 24 hours/day on Channel 57- the local government television channel.

For more information, please contact [Joseph Smith] at [555-555-6789]. More information is also available from the EPA Safe Drinking Water Hotline at 1-800-426-4794 and [the Public Health Department Hotline at 1-800-123-4567].

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand.

This notice is being sent to you by [City of Rolling Brook Water System]. State Water System ID#[50005]. Date distributed: [October 10, 2003]

Example Do Not Use Notice

WARNING

DO NOT USE THE WATER

[Lyonelle Water System] water is contaminated with [parathion]

Bottled water can be obtained at [Murray High School and Central High School 24 hours per day].

Parathion was found in the water supply on [November 14]. This chemical can make you sick and may result in death.

What should I do?

- DO NOT USE THE WATER. You should ***not*** use the water for drinking, making ice, brushing teeth, washing dishes, washing clothes, bathing, food preparation, or watering lawns. Bottled water should be used for all of the above necessities until further notice.

- Parathion is a chemical usually used to kill insects. It can cause constriction of the pupils, blurred vision, muscle and abdominal cramps, excessive salivation, sweating, nausea, vomiting, dizziness, headaches, convulsions, diarrhea, weakness, labored breathing, wheezing, and unconsciousness. Exposure can even lead to death.

- If you or someone you know exhibits any of these symptoms, immediately contact your health care provider. In addition, please notify the public health department at 1-800-123-4567.

What happened? What is being done?

The water distribution system was contaminated with parathion. We are working with law enforcement and the public health department to investigate/resolve this issue. We have tested the water in various parts of the distribution system to verify the extent of the parathion contamination. Based on these tests, we have isolated the portion of the system located north of Lincoln Avenue and east of Maple Road. Everyone in this portion of the system **should not use the water**. We have implemented additional security procedures to protect the system against further contamination. Additional information will be provided 24 hours/day on Channel 57- the local government television channel.

For more information, please contact [Joseph Smith] at [555-555-6789]. More information is also available from the EPA Safe Drinking Water Hotline at 1-800-426-4794 and [the Public Health Department Hotline at 1-800-321-4567].

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand.

This notice is being sent to you by [Lyonelle Water System]. State Water System ID# [90008]. Date distributed: [November 14, 2003]

Appendix B: GUARDING AGAINST TERRORIST AND SECURITY THREATS

Suggested Measures for Drinking Water and Wastewater Utilities (Water Utilities)

United States Environmental Protection Agency

Mid-Atlantic Region covering Delaware, Maryland, Pennsylvania, Virginia, West Virginia and the District of Columbia **April 2003**

GUARDING AGAINST TERRORIST AND SECURITY THREATS

Suggested Measures for Drinking Water and Wastewater Utilities (Water Utilities)

The Department of Homeland Security (DHS) established a five-tiered Homeland Security Advisory System to provide a national framework for notification about the nature and degree of terrorist threats. The system establishes a set of graduated levels that change in response to increases or decreases in terrorist threats. The threat levels are colored coded, beginning with green, and increasing in severity through blue, yellow, orange, and red. While the threat may not be specific to water utilities, the water sector, as one of the thirteen critical sectors identified by DHS, may consider themselves potential targets.

Why is EPA offering these suggestions?

Water utilities are in the forefront of ensuring that our nation's water systems are protected against terrorist threats. Many utilities have already developed safeguards. This document provides model guidelines for water utilities to increase security based on threat conditions described by the five-tiered Homeland Security Advisory System. Please note that the attached document is a guide; it is a not a requirement under any regulation or legislation.

This document provides suggested steps water utilities should consider implementing in the areas of detection, preparedness, prevention, and protection. The suggested measures are additive in that higher threat levels should also include those measures outlined in the document for lower threat levels. These suggestions are based on practices employed by various systems across the nation. The ability to implement them at the system level will vary. Note that these general recommendations should be adapted by the utility depending on the system size, status of emergency response planning at the utility, and identified system vulnerabilities. These suggestions should not be viewed as a complete source of information on protecting water utilities. Facility managers and utility security directors should consider the full range of resources available, as well as the specific nature of the threats, when responding to changes in threat condition levels.

Based on strong recommendations from the water sector, EPA is making this document available to water utilities and to the secure WaterISAC (www.waterisac.org). EPA is also providing this document to the state drinking water administrators. Some state homeland security and emergency response programs have issued suggestions to their critical infrastructures, including water. State drinking water administrators are encouraged to coordinate with state homeland security and emergency response programs and modify these suggested measures as appropriate to ensure consistency.

CONDITION	CONSIDER ADOPTING THESE MEASURES	
LOW (GREEN) **Low Risk of Terrorist Attack** **Signifies a *low risk* of terrorist attacks. Protective measures should focus on ongoing facility assessments; and the development, testing, and implementation of emergency plans. In addition to THREAT LEVEL GREEN, there are four higher threat levels: blue, yellow, orange, and red. (Please refer to the other fact sheets for information on suggested steps to be taken during other threat condition levels.)**	Detection	▪ Monitor water quality at the source water, leaving the plant, and in distribution and storage systems. Establish baseline results. Review operational and analytical data to detect unusual variations. ▪ Follow-up on customer complaints concerning water quality and/or suspicious behavior on the facilities. ▪ Confirm communication protocol with public health officials concerning potential waterborne illnesses.
	Preparedness	▪ Post emergency evacuation plans in accessible, but secure, location near entrance for immediate access by law enforcement, fire response, and other first responders. ▪ Inventory spare parts and on-hand chemicals. Check if sufficient. ▪ Identify sensitive populations within the service area (e.g., hospitals, nursing homes, daycare centers, schools, etc.) for notification, as appropriate, in the event of a specific threat against the utility. ▪ Back-up critical files such as plans and drawings, as-builts, sampling results, billing, and other critical information. ▪ Conduct appropriate background investigations of staff, contractors, operators, and others with access to the facility. ▪ Prepare vulnerability assessments and revise to incorporate changes made (e.g., assets added/replaced or new countermeasures implemented). ▪ Ensure that employees understand appropriate emergency notification procedures.
	Prevention	▪ Train staff in safety procedures, such as handling hazardous materials and maintaining and using self-contained breathing apparatus. ▪ Secure equipment such as vehicles and spare parts. ▪ Monitor requests for potentially sensitive information.
	Protection	▪ Check all chemical deliveries for driver identification and verification of load. ▪ Maintain vigilance and be alert to suspicious activity. Inspect buildings in regular use for suspicious packages and evidence of unauthorized entry. Report any suspicious activity to appropriate authorities. ▪ Prosecute intruders, trespassers, and those detained for tampering to the fullest extent possible under applicable laws. ▪ Review request for tours and identify protocols for managing the tour. ▪ Implement controls for construction activities at critical sites. ▪ Maintain disinfectant residuals as required by regulations. ▪ Implement best management practices for optimizing drinking water treatment.

CONDITION	CONSIDER ADOPTING THESE MEASURES (and those at lower threat levels)	
GUARDED (BLUE) **General Risk of Terrorist Attacks** **Signifies a *guarded risk* of terrorist attacks. Protective measures should focus on activating employee and public information plans; exercising communication channels with response teams and local agencies; and reviewing and exercising emergency plans.**	Detection	▪ Test security alarms and systems for reliability.
	Preparedness	▪ Reaffirm communication and coordination protocols (embedded in the utility's emergency response plan) with local authorities such as police and fire departments, HAZMAT teams, hospitals, and other first responders. ▪ Prepare and/or revise emergency response plans associated communication protocols. Include appropriate local officials concerned with law enforcement, emergency response and public health. ▪ On a regular basis post employee reminders about events that constitute security violations and ensure employees understand notification protocol in the event of a security breach. ▪ Prepare draft press releases, public notices and other communications for a variety of incidents. Route through appropriate channels of review to ensure pieces are clear and consistent.
	Prevention	▪ Secure buildings, rooms, and storage areas not in regular use. Maintain a list of secured areas or facilities and monitor activity in these areas.
	Protection	▪ Control access to mission critical facilities.

CONDITION	CONSIDER ADOPTING THESE MEASURES (and those at lower threat levels)	
ELEVATED (YELLOW) **Significant Risk of Terrorist Attack** Signifies an **elevated risk** of terrorist attacks. Protective measures should focus on increasing surveillance of critical facilities; coordinating response plans with allied utilities and response teams and local agencies; and implementing emergency plans, as appropriate.	Detection	▪ To the extent possible, increase the frequency and extent of monitoring activities and review results against baseline. ▪ Increase review of operational and analytical data (including customer complaints) with an eye toward detecting unusual variability (as an indicator of unexpected changes in the product). Variations due to natural or routine operational variability should be considered first. ▪ Increase surveillance activities in source and finished water areas.
	Preparedness	▪ Review and update emergency response procedures and communication protocols. ▪ Establish unannounced security spot checks (e.g., verification of personal identification and door security) at access control points for critical facilities. ▪ Increase frequency for posting employee reminders of the threat situation and about events that constitute security violations. ▪ Ensure employees understand notification protocol in the event of a security breach. ▪ Conduct security audit of physical security assets, such as fencing and lights, and repair or replace missing/broken assets. Remove debris from along fence-lines that could be stacked to facilitate scaling. ▪ Maximize physical control of all equipment and vehicles inoperable when not in-use, (e.g., lock steering wheels, secure keys, chain and padlock on front-end loaders, etc.). ▪ Review draft communications on potential incidents, brief media relations personnel of potential for press contact and/or issuance of release. ▪ Review and update list of sensitive populations within the service area, such as hospitals, nursing homes, daycare centers, schools, etc., for notification, as appropriate, in the event of a specific threat against the utility. ▪ Contact neighboring water utilities to review coordinated response plans and mutual aid during emergencies. ▪ Review whether critical replacement parts are available and accessible.
	Prevention	▪ Carefully review all facility tour requests before approving. If allowed, implement security measures to include list of names prior to tour, request identification of each attendee prior to tour, prohibit backpacks/duffle bags, cameras and identify parking restrictions. ▪ On a daily basis, inspect the interior and exterior of buildings in regular use for suspicious activity or packages, signs of tampering, or indications of unauthorized entry. ▪ Implement mailroom security procedures. Follow guidance provided by the United States Postal Service.
	Protection	▪ Verify the identity of all personnel entering the water utility. Mandate visible use of identification badges. Randomly check identification badges and cards of those on the premises. ▪ At the discretion of the facility manager or security director, remove all vehicles and objects (e.g., trash containers) located near mission critical facility security perimeters and other sensitive areas. ▪ Verify the security of critical information systems (e.g., Supervisory Control and Data Acquisition (SCADA), Internet, email, etc.) and review safe computer and internet access procedures with employees to prevent cyber intrusion. ▪ Consider steps needed to control access to all areas under the jurisdiction of the water utility.

CONDITION	CONSIDER ADOPTING THESE MEASURES (and those at lower threat levels)	
HIGH **(ORANGE)** **High Risk of Terrorist Attack** Signifies a **high risk** of terrorist attacks. Protective measures should focus on limiting facility access to essential staff and contractors, and coordinating security efforts with local law enforcement officials and the armed forces, as appropriate.	Detection	▪ Increase the frequency and extent of monitoring activities. Review results against baseline. ▪ Confirm that county and state health officials are on high alert and will inform water utilities of any potential waterborne illnesses. ▪ If a neighborhood watch-type program is in place, notify the community and request increased awareness.
	Preparedness	▪ Confirm emergency response and laboratory analytical support network are ready for deployment 24 hours per day, 7 days a week. ▪ Reaffirm liaison with local police, intelligence, and security agencies to determine likelihood of an attack on the water utility personnel and facility and consider appropriate protective measures (e.g., road closing, extra surveillance, etc.). ▪ Practice communications protocol with local authorities and others cited in the facility's emergency response plan. ▪ Post frequent reminders for staff and contractors of the threat level, along with a reminder of what events constitute security violations. ▪ Ensure employees are fully aware of emergency response communication protocols and have access to contact information for relevant law enforcement, public health, environmental protection, and emergency response organizations. ▪ Inspect and practice activation of available emergency interconnections with neighboring water agencies. ▪ Have alternative water supply plan ready to implement (e.g., bottled water delivery).
	Prevention	▪ Discontinue tours and prohibit public access to all operational facilities. ▪ Consider requesting increased law enforcement surveillance, particularly of critical assets and otherwise unprotected areas.
	Protection	▪ Evaluate need to staff water treatment/production facility at all times. ▪ Consider the need to prohibit recreational use of surface water reservoirs. ▪ Increase security patrol activity to the maximum level sustainable and ensure tight security in the vicinity of mission critical facilities. Vary the timing of security patrols. ▪ Request employees change password on critical information management systems.

CONDITION	CONSIDER ADOPTING THESE MEASURES (and those at lower threat levels)	
SEVERE (RED) **Severe Risk of Terrorist Attack** **Signifies a *severe risk* of terrorist attacks. Protective measures should focus on the decision to close specific facilities and the redirection of staff resources to critical operations.**	Detection	▪ Ensure that list of sensitive populations (e.g., hospitals, nursing homes, daycare centers, schools, etc.) within the service area is accurate and shared with appropriate public health officials. ▪ Reconfirm that county and state health officials are on high alert and will inform water utilities of any potential waterborne illnesses.
	Preparedness	▪ Post daily notices to staff regarding threat level and appropriate security practices ▪ Where appropriate, place back-up operational capacity on-line (water treatment plant filters, turbines, etc.). ▪ Ensure key utility personnel are on duty. ▪ Where appropriate, provide public notification for citizens to store emergency water supply or to implement other preparatory measures. ▪ Evaluate the need for opening an emergency operations center.
	Prevention	▪ As appropriate, request increased law enforcement and/or security agency surveillance, particularly of critical assets and otherwise unprotected areas (e.g., consider if National Guard assistance is needed and make appropriate request). ▪ Limit access to facilities and activities to essential personnel. ▪ Consider whether mail and packages should go to a central, secure location and be inspected before distribution. Remind mailroom personnel of the need for heightened awareness when sorting and distributing all incoming mail.
	Protection	▪ Ensure existing security policies, procedures, and equipment are effectively implemented. ▪ Recheck security of all on-site chemical storage and utilization areas. ▪ Implement frequent and staggered inspections of the exterior of buildings (to include roof areas) and parking areas. ▪ Re-check the security of critical information systems (e.g., SCADA, Internet, email, etc.) and have staff change computer passwords. ▪ Consider placing staff at remote (typically unmanned) facilities.

Appendix C: Example Action Plans

*Water System Contamination**

Threat Warning Stage

Threat Warning Received	Special actions and notifications to be taken: • Notify ER Lead or Alternate ER Lead • Record and document all information pertaining to the threat warning • Do not disturb site if the threat warning could be a possible crime scene • Return to normal operations if no further action is required (i.e., the threat warning can be explained) • Begin the "Threat Decision Process" if the threat warning cannot be explained

↓

Threat Decision Process Stage

Is the Threat Possible? (Stage 1)	Special actions and notifications to be taken: • Notify local law enforcement • Notify State Drinking Water Primacy Agency • Evaluate threat warning and make decisions in consultation with State Drinking Water Primacy Agency and local law enforcement • Initiate basic precautionary measures: 1. Alert staff and personnel about threat warning 2. Prepare additional notification lists if the situation escalates to the "Is the Threat Credible?" stage

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If the threat is not possible, then return to normal operations. Otherwise, proceed to "Is the Threat Credible" stage.

Is the Threat Credible? (Stage 2)	Special actions and notifications to be taken: • Activate notification and personnel safety portions of ERP • Evaluate whether the threat is credible in consultation with assisting agencies • Visually inspect physical evidence and determine whether there is a change in normal system operating parameters (i.e., chlorine residuals, turbidity, odor, color, pH, etc.) • Conduct actions and testing as recommended by monitoring and sampling experts

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If the threat is not credible, then return to normal operations. Otherwise, proceed to "Has the Threat been Confirmed" stage.

Has the Incident Been Confirmed? (Stage 3)	Special actions and notifications to be taken: • Initiate full ERP activation • Follow State Incident Command System • Isolate portion of system or backflush • Shut down system if obvious or confirmed contamination warrants • Issue public notice and issue follow-up media press releases • Continue sampling and water monitoring • Assess need to remediate storage tanks, filters, sediment basins, solids handling, etc.

*This is a simplified Action Plan example that includes the threat decision process to determine if the major event is just a threat or actual event. You should develop this "Action Plan" specific to the needs of your CWS and surrounding community.

*Structural Damage/Physical Attack to Water System or Facility(ies)**

Threat Warning Stage

Threat Warning Received	Special actions and notifications to be taken: • Notify ER Lead or Alternate ER Lead • Record and document all information pertaining to the threat warning • Do not disturb site if the threat warning could be a possible crime scene • Return to normal operations if no further action is required (i.e., the threat warning can be explained) • Begin the "Threat Decision Process" if the threat warning cannot be explained

▼

Threat Decision Process Stage

Is the Threat Possible? (Stage 1)	Special actions and notifications to be taken: • Notify local law enforcement • Notify State Drinking Water Primacy Agency • Evaluate threat warning and make decisions in consultation with State Drinking Water Primacy Agency and local law enforcement • Initiate basic precautionary measures: 1. Alert staff and personnel about threat warning 2. Heighten security at critical facilities 3. Prepare additional notification lists if the situation escalates to the "Is the Threat Credible?" stage

▼

If the threat is not possible, then return to normal operations. Otherwise, proceed to "Is the Threat Credible" stage.

Is the Threat Credible? (Stage 2)	Special actions and notifications to be taken: • Activate notification and personnel safety portions of ERP • Physically secure water system facilities • Evaluate whether the threat is credible in consultation with assisting agencies

▼

If the threat is not credible, then return to normal operations. Otherwise, proceed to "Has the Threat been Confirmed" stage.

Has the Incident Been Confirmed? (Stage 3)	Special actions and notifications to be taken: • Initiate full ERP activation • Follow State Incident Command System • Deploy damage assessment team • Isolate damaged facility from rest of water system • Coordinate alternative water supply, as needed, or consider alternate (interim) treatment schemes • Issue public notice and issue follow-up media press releases • Repair damaged facilities • Assess need for additional protection/security measures

*This is a simplified Action Plan example that includes the threat decision process to determine if the major event is just a threat or actual event. You should develop this "Action Plan" specific to the needs of your CWS and surrounding community.

*Cyber Attack on SCADA or Operational Computer System**

Threat Warning Stage

Threat Warning Received	Special actions and notifications to be taken: • Notify ER Lead or Alternate ER Lead • Record and document all information pertaining to the threat warning • Do not disturb site if the threat warning could be a possible crime scene • Return to normal operations if no further action is required (i.e., the threat warning can be explained) • Begin the "Threat Decision Process" if the threat warning cannot be explained

Threat Decision Process Stage

Is the Threat Possible? (Stage 1)	Special actions and notifications to be taken: • Notify local law enforcement • Notify State Drinking Water Primacy Agency • Evaluate threat warning and make decisions in consultation with State Drinking Water Primacy Agency and local law enforcement • Initiate basic precautionary measures: 1. Alert staff and personnel about threat warning 2. Temporarily shut down SCADA system and go to manual operation using established protocol 3. Prepare additional notification lists if the situation escalates to the "Is the Threat Credible?" stage

If the threat is not possible, then return to normal operations. Otherwise, proceed to "Is the Threat Credible" stage.

Is the Threat Credible? (Stage 2)	Special actions and notifications to be taken: • Activate notification and personnel safety portions of ERP • Continue manual operation using established protocol • Consider whether to isolate source water • Consider whether to shut down system and provide alternate water • Evaluate whether the threat is credible in consultation with assisting agencies • Conduct actions/testing recommended by monitoring and sampling experts

If the threat is not credible, then return to normal operations. Otherwise, proceed to "Has the Threat been Confirmed" stage.

Has the Incident Been Confirmed? (Stage 3)	Special actions and notifications to be taken: • Initiate full ERP activation • Follow State Incident Command System • Continue manual operation, source water isolation, or system shut down and alternate water supply, as appropriate • Issue public notice and issue follow-up media press releases • Make image copy of all system logs to preserve evidence • With law enforcement assistance, check for implanted backdoors and other malicious code before restarting SCADA system • Install safeguards before restarting SCADA system • Bring SCADA system up and monitor system • Assess/implement additional precautions for SCADA system

*This is a simplified Action Plan example that includes the threat decision process to determine if the major event is just a threat or actual event. You should develop this "Action Plan" specific to the needs of your CWS and surrounding community.

*Hazardous Chemical Release from Water System Facility(ies)**

Threat Warning Stage

Threat Warning Received	Special actions and notifications to be taken: • Notify ER Lead or Alternate ER Lead • Record and document all information pertaining to the threat warning • Do not disturb site if the threat warning could be a possible crime scene • Return to normal operations if no further action is required (i.e., the threat warning can be explained) • Begin the "Threat Decision Process" if the threat warning cannot be explained

↓

Threat Decision Process Stage

Is the Threat Possible? (Stage 1)	Special actions and notifications to be taken: • Notify local law enforcement • Notify State Drinking Water Primacy Agency • Evaluate threat warning and make decisions in consultation with State Drinking Water Primacy Agency and local law enforcement • Initiate basic precautionary measures: 1. Alert staff and personnel about threat warning 2. Post full-time operations personnel at the chemical treatment areas of the facility 3. Verify that monitoring, leak detection, and personal protection equipment are fully operational 4. Prepare additional notification lists if the situation escalates to the "Is the Threat Credible?" stage

↓

If the threat is not possible, then return to normal operations. Otherwise, proceed to "Is the Threat Credible" stage.

Is the Threat Credible? (Stage 2)	Special actions and notifications to be taken: • Activate notification and personnel safety portions of ERP • Physically secure water system facilities and specifically the chemical treatment areas of the facility • Identify potentially hazardous chemical(s) to appropriate assisting agencies • Based on Risk Management program and ERP, evaluate potential extent of public evacuation or shelter in place order • Evaluate whether the threat is credible in consultation with assisting agencies

↓

If the threat is not credible, then return to normal operations. Otherwise, proceed to "Has the Threat Been Confirmed" stage.

Has the Incident Been Confirmed? (Stage 3)	Special actions and notifications to be taken: • Initiate full ERP activation • Follow State Incident Command System • Determine extent/concentration of chemical release and deploy damage assessment team • Turn off chemical treatment equipment and isolate chemical treatment areas from rest of water system • Depending on extent and concentration of release, issue evacuation or shelter in place order per Risk Management Program and ERP • Coordinate alternative water supply, as needed, or consider alternate (interim) treatment schemes • Issue public notice and issue follow-up media press releases • Repair damaged facilities • Assess need for additional protection/security measures

*This is a simplified Action Plan example that includes the threat decision process to determine if the major event is just a threat or actual event. You should develop this "Action Plan" specific to the needs of your CWS and surrounding community.

Appendix D-5

City of Clark Fork Consumer Confidence Report for 2018

CCR 2018

Is my water safe?

We are pleased to present this year's Annual Water Quality Report (Consumer Confidence Report) as required by the Safe Drinking Water Act (SDWA). This report is designed to provide details about where your water comes from, what it contains, and how it compares to standards set by regulatory agencies. This report is a snapshot of last year's water quality. We are committed to providing you with information because informed customers are our best allies.

Do I need to take special precautions?

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/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Water Drinking Hotline (800-426-4791).

Where does my water come from?

Your water comes from two wells. One is off the East Spring Creek Road and it is known as the spring Creek Well. The second well, which is known as the Town Well, is located off of 9th Street and it is used for emergencies only. We own or lease the land around the wells and restrict any activity that could contaminate them. After the water comes out of the well we adjust the pH by adding Soda Ash and we also disinfect the water by treating it with chlorine. The water is pumped to our storage reservoir on Pugh Hill where it then enters the distribution system.

Source water assessment and its availability

The sources of all drinking water, not just ours, (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and in some cases, radioactive material, and can pick up substances resulting from the presences of animals or from human activity.

Why are there contaminants in my drinking water?

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 that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's (EPA) Safe Drinking Water Hotline (800-426-4791). The sources of drinking water (both tap water and bottled water)

include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity: microbial contaminants, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife; inorganic contaminants, such as salts and metals, which can be naturally occurring or result from urban stormwater runoff, industrial, or domestic wastewater discharges, oil and gas production, mining, or farming; pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses; organic Chemical Contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems; and radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities. In order to ensure that tap water is safe to drink, EPA prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

How can I get involved?

There is a Regular City Council Meeting at City Hall on the second Monday of every month at 7:00 pm. Please join us, also if you have any questions please call us at 208-266-1315 during our regular business hours 8:00 am to 12:00 pm Monday through Friday.

Description of Water Treatment Process

Your water is treated by disinfection. Disinfection involves the addition of chlorine or other disinfectant to kill dangerous bacteria and microorganisms that may be in the water. Disinfection is considered to be one of the major public health advances of the 20th century.

Water Conservation Tips

Did you know that the average U.S. household uses approximately 400 gallons of water per day or 100 gallons per person per day? Luckily, there are many low-cost and no-cost ways to conserve water. Small changes can make a big difference - try one today and soon it will become second nature.

- Take short showers - a 5-minute shower uses 4 to 5 gallons of water compared to up to 50 gallons for a bath.
- Shut off water while brushing your teeth, washing your hair and shaving and save up to 500 gallons a month.
- Use a water-efficient showerhead. They're inexpensive, easy to install, and can save you up to 750 gallons a month.
- Run your clothes washer and dishwasher only when they are full. You can save up to 1,000 gallons a month.
- Water plants only when necessary.

- Fix leaky toilets and faucets. Faucet washers are inexpensive and take only a few minutes to replace. To check your toilet for a leak, place a few drops of food coloring in the tank and wait. If it seeps into the toilet bowl without flushing, you have a leak. Fixing it or replacing it with a new, more efficient model can save up to 1,000 gallons a month.
- Adjust sprinklers so only your lawn is watered. Apply water only as fast as the soil can absorb it and during the cooler parts of the day to reduce evaporation.
- Teach your kids about water conservation to ensure a future generation that uses water wisely. Make it a family effort to reduce next month's water bill!
- Visit www.epa.gov/watersense for more information.

Cross Connection Control Survey

The purpose of this survey is to determine whether a cross-connection may exist at your home or business. A cross connection is an unprotected or improper connection to a public water distribution system that may cause contamination or pollution to enter the system. We are responsible for enforcing cross-connection control regulations and insuring that no contaminants can, under any flow conditions, enter the distribution system. If you have any of the devices listed below please contact us so that we can discuss the issue, and if needed, survey your connection and assist you in isolating it if that is necessary.

- Boiler/ Radiant heater (water heaters not included)
- Underground lawn sprinkler system
- Pool or hot tub (whirlpool tubs not included)
- Additional source(s) of water on the property
- Decorative pond
- Watering trough

Source Water Protection Tips

Protection of drinking water is everyone's responsibility. You can help protect your community's drinking water source in several ways:

- Eliminate excess use of lawn and garden fertilizers and pesticides - they contain hazardous chemicals that can reach your drinking water source.
- Pick up after your pets.
- If you have your own septic system, properly maintain your system to reduce leaching to water sources or consider connecting to a public water system.
- Dispose of chemicals properly; take used motor oil to a recycling center.
- Volunteer in your community. Find a watershed or wellhead protection organization in your community and volunteer to help. If there are no active groups, consider starting one. Use EPA's Adopt Your Watershed to locate groups in your community or visit the Watershed Information Network's How to Start a Watershed Team.
- Organize a storm drain stenciling project with your local government or water supplier. Stencil a message next to the street drain reminding people "Dump No Waste - Drains to River" or "Protect Your Water." Produce and distribute a flyer for households to remind residents that storm drains dump directly into your local water body.

Results of radon monitoring

Radon is a radioactive gas that you can't see, taste, or smell. It is found throughout the U.S. Radon can move up through the ground and into a home through cracks and holes in the foundation. Radon can build up to high levels in all types of homes. Radon can also get into indoor air when released from tap water from showering, washing dishes, and other household activities. Compared to radon entering the home through soil, radon entering the home through tap water will in most cases be a small source of radon in indoor air. Radon is a known human carcinogen. Breathing air containing radon can lead to lung cancer. Drinking water containing radon may also cause increased risk of stomach cancer. If you are concerned about radon in your home, test the air in your home. Testing is inexpensive and easy. Fix your home if the level of radon in your air is 4 picocuries per liter of air (pCi/L) or higher. There are simple ways to fix a radon problem that aren't too costly. For additional information, call your state radon program or call EPA's Radon Hotline (800-SOS-RADON).

Additional Information for Lead

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. City of Clark Fork 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, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.

Water Quality Data Table

In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of contaminants in water provided by public water systems. The table below lists all of the drinking water contaminants that we detected during the calendar year of this report. Although many more contaminants were tested, only those substances listed below were found in your water. All sources of drinking water contain some naturally occurring contaminants. At low levels, these substances are generally not harmful in our drinking water. Removing all contaminants would be extremely expensive, and in most cases, would not provide increased protection of public health. A few naturally occurring minerals may actually improve the taste of drinking water and have nutritional value at low levels. Unless otherwise noted, the data presented in this table is from testing done in the calendar year of the report. The EPA or the State requires us to monitor for certain contaminants less than once per year because the concentrations of these contaminants do not vary significantly from year to year, or the system is not considered vulnerable to this type of contamination. As such, some of our data, though representative, may be more than one year old. In this table you will find terms and abbreviations

that might not be familiar to you. To help you better understand these terms, we have provided the definitions below the table.

Contaminants	MCLG or MRDLG	MCL, TT, or MRDL	Detect In Your Water	Range		Sample Date	Violation	Typical Source
				Low	High			
Disinfectants & Disinfection By-Products								
(There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants)								
Chlorine (as Cl2) (ppm)	4	4	.66	.3	.66	2017	No	Water additive used to control microbes
Haloacetic Acids (HAA5) (ppb)	NA	60	23.5	NA	23.5	2017	No	By-product of drinking water chlorination
TTHMs [Total Trihalomethanes] (ppb)	NA	80	.94	NA	NA	2017	No	By-product of drinking water disinfection
Radioactive Contaminants								
Alpha emitters (pCi/L)	0	15	.02	NA	NA	2016	No	Erosion of natural deposits

Contaminants	MCLG	AL	Your Water	Sample Date	# Samples Exceeding AL	Exceeds AL	Typical Source
Inorganic Contaminants							
Copper - action level at consumer taps (ppm)	1.3	1.3	.641	2015		No	Corrosion of household plumbing systems; Erosion of natural deposits
Inorganic Contaminants							
Lead - action level at consumer taps (ppb)	0	15	6	2015		No	Corrosion of household plumbing systems; Erosion of natural deposits

Undetected Contaminants

The following contaminants were monitored for, but not detected, in your water.

Contaminants	MCLG or MRDLG	MCL, TT, or MRDL	Your Water	Violation	Typical Source
Nitrate [measured as Nitrogen] (ppm)	10	10	ND	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Uranium (ug/L)	0	30	ND	No	Erosion of natural deposits

Unit Descriptions	
Term	**Definition**
ug/L	ug/L : Number of micrograms of substance in one liter of water
ppm	ppm: parts per million, or milligrams per liter (mg/L)
ppb	ppb: parts per billion, or micrograms per liter (µg/L)
pCi/L	pCi/L: picocuries per liter (a measure of radioactivity)
NA	NA: not applicable
ND	ND: Not detected
NR	NR: Monitoring not required, but recommended.

Important Drinking Water Definitions	
Term	**Definition**
MCLG	MCLG: Maximum Contaminant Level Goal: 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.
MCL	MCL: Maximum Contaminant Level: 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.
TT	TT: Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.
AL	AL: Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
Variances and Exemptions	Variances and Exemptions: State or EPA permission not to meet an MCL or a treatment technique under certain conditions.
MRDLG	MRDLG: Maximum residual disinfection level goal. The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
MRDL	MRDL: Maximum residual disinfectant level. The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
MNR	MNR: Monitored Not Regulated
MPL	MPL: State Assigned Maximum Permissible Level

For more information please contact:

Contact Name: Amber Burgess
Address: P. O. Box 10
Clark Fork, ID 83811
Phone: 208-266-1315

Appendix D-6

Water Meter Replacement Program

City of Clark Fork
Water Meter Replacement Plan

Our current water meters were installed approximately 2008.

We are budgeting approximately 12 meters to be replaced each year at a cost of $300 each = $3,600. This will include any meters that fail within the year. This would mean that our 277 meters would be updated within a 23 year period.

The meter reader gauges occasionally need to be replaced – we will be replacing those when the monthly read of the meter is unable to be read three times in a row. The cost of the readers is $175 each. Currently we are replacing about 50 readers but they are still on a warranty for a very short time period.

Appendix D-7

Water Conservation Program

City of Clark Fork

Water Conservation Program

After our monthly meter read we print out a “Leaks Report”. Our Maintenance crew personally contacts the resident to communicate the leak problem the first time their leak shows up on our report.

During our monthly number compilation, we can compare the % usage -vs- the # gallons pumped. If there is a large difference from previous months we investigate for a possible cause. The City of Clark Fork lies on an old river bed, this makes a visual leak very difficult since the water drains so well through our rocks. Occasionally we might be able to see the leak above ground. The only other option is to use a geophone. This is a very time intensive process as you must follow the water line and audibly listen for changes.

If a main line leak is discovered through the previous methods repair is instituted.

The other possible conservation of water is the resident’s usage. Primarily during summer months we can recommend the watering of lawns in the mornings until 10:00 AM and evening times with a timer used for shut off. We will be advising this through our social media avenues.

Appendix E-1

IDEQ “Idaho Rules for Public Drinking Water Systems”

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IDAPA 58
TITLE 01
CHAPTER 08

58.01.08 - IDAHO RULES FOR PUBLIC DRINKING WATER SYSTEMS

000. LEGAL AUTHORITY.

The Idaho Legislature has given the Idaho Board of Environmental Quality the authority to promulgate rules governing quality and safety of drinking water, pursuant to Title 37, Chapter 21 and Title 39, Chapter 1, Idaho Code. (5-3-03)

001. TITLE AND SCOPE.

01. Title. These rules shall be cited in full as Idaho Department of Environmental Quality Rules, IDAPA 58.01.08, "Idaho Rules for Public Drinking Water Systems." (10-1-93)

02. Scope. The purpose of these rules is to control and regulate the design, construction, operation, maintenance, and quality control of public drinking water systems to provide a degree of assurance that such systems are protected from contamination and maintained free from contaminants which may injure the health of the consumer. (10-1-93)

002. INCORPORATION BY REFERENCE AND AVAILABILITY OF REFERENCED MATERIALS.

01. Incorporation by Reference. The following documents are incorporated by reference into these rules. (4-11-06)

a. 40 CFR Parts 141 and 143. Any reference in these rules to requirements, procedures, or specific forms contained in any section or subsection of 40 CFR Parts 141 and 143 shall constitute the full adoption by reference of that section or subsection, including any notes and appendices therein, unless expressly provided otherwise in these rules (4-11-06)

b. American Water Works Association (AWWA) Standards, effective December 2009, available for a fee from the AWWA, 6666 West Quincy Avenue, Denver, Colorado 80235, Telephone (800) 926-7337. (4-7-11)

02. Availability of Specific Referenced Material. Copies of specific documents referenced within these rules are available at the following locations: (4-11-06)

a. All federal regulations: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, Telephone (202)783-3238; U.S. Government Bookstore, Room 194, Federal Bldg., 915 Second Ave., Seattle, WA 98174, (206) 553-4270; or Online at http://www.gpoaccess.gov/ecfr/index.html. (4-7-11)

b. All documents incorporated by reference are available for review at the Department of Environmental Quality, 1410 N. Hilton, Boise, ID 83706-1255, (208) 373-0502. (4-7-11)

c. Recommended Standards for Water Works: a report of the Water Supply Committee of the Great Lakes -- Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, published by Health Education Services, P.O. Box 7126, Albany, New York 12224, Telephone (518) 439-7286. (4-7-11)

d. Manual of Individual and Non-Public Water Supply Systems (EPA 570/9-91-004), published by the U.S. Environmental Protection Agency, available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C.20402, Telephone (202) 782-3238. (5-3-03)

e. U.S. Department of Commerce, National Bureau of Standards Handbook, No. 69, "Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure" as amended in 1963, NCRP Publications, P.O. Box 20175, Washington, D.C. 20014. (12-10-92)

f. Rules of the Idaho Water Resources Board are available at http://www.adminrules.idaho.gov/rules/37/37index.htm, or the Idaho Department of Water Resources, Idaho Water Center, 322 E. Front St., P.O. Box 83720,

Boise, Idaho 83720-0098, Telephone (208) 287-4800. (3-30-07)

g. ANSI/NSF Standard 44-2002e -- 2004, Residential Cation Exchange Water Softeners, available from the National Sanitation Foundation, 789 N. Dixboro Road, Ann Arbor, Michigan 48105, Telephone (734) 769-8010. (4-6-05)

h. ANSI/NSF Standard 53-2002e -- 2003, Drinking Water Treatment Units -- Health Effects, available from the National Sanitation Foundation, 789 N. Dixboro Road, Ann Arbor, Michigan 48105, Telephone (734) 769-8010. (4-6-05)

i. ANSI/NSF Standard 55-2002 -- 2002, Ultraviolet Microbiological Water Treatment Systems, available from the National Sanitation Foundation, 789 N. Dixboro Road, Ann Arbor, Michigan 48105, Telephone (734) 769-8010. (4-6-05)

j. ANSI/NSF Standard 58-2003 -- 2004, Reverse Osmosis Drinking Water Treatment Systems, available from the National Sanitation Foundation, 789 N. Dixboro Road, Ann Arbor, Michigan 48105, Telephone (734) 769-8010. (4-6-05)

k. ANSI/NSF Standard 60-2000a -- 2000, Drinking Water Treatment Chemicals -- Health Effects, available from the National Sanitation Foundation, 789 N. Dixboro Road, Ann Arbor, Michigan 48105, Telephone (734) 769-8010. (4-6-05)

l. ANSI/NSF Standard 61-2000a -- 2000, Drinking Water System Components -- Health Effects, available from the National Sanitation Foundation, 789 N. Dixboro Road, Ann Arbor, Michigan 48105, Telephone (734) 769-8010. (4-6-05)

m. American Water Works Association (AWWA) Standards, available from the AWWA, 6666 West Quincy Avenue, Denver, Colorado 80235, (800) 926-7337, www.awwa.org. (3-30-07)

n. Cross Connection Control Manual, available from Pacific Northwest Section of the American Water Works Association, P.O. Box 19581, Portland, OR, 97280-0581, Telephone (503) 246-5845. (3-30-07)

o. Manual of Cross-Connection Control, Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California, KAP-200 University Park MC-2531, Los Angeles, CA 90089-2531, (866)545-6340, www.usc.edu/dept/fccchr/. (3-30-07)

p. Manual on Slow Sand Filtration (1991), published by AWWA Research Foundation 6666 West Quincy Avenue, Denver, CO 80235, (800)926-7337, www.awwa.org. (3-30-07)

q. Slow Sand Filtration (1991), published by the American Society of Civil Engineers American Society of Civil Engineers,1801Alexander Bell Drive, Reston, VA 20191, (800)548-2723, www.asce.org. (3-30-07)

r. Slow Sand Filtration and Diatomaceous Earth Filtration for Small Water Systems, DOH Pub #331-204 (4/03), Washington State Department of Health, Division of Environmental Health, Office of Drinking Water, PO Box 47828, Olympia WA 98504-7828, (360)236-3100 or (800)521-0323, http://www.doh.wa.gov/ehp/dw/Programs/water_sys_design.htm. (3-30-07)

s. Water System Design Manual, DOH Pub #331-123 (Rev. 8/01), Washington State Department of Health, Division of Environmental Health, Office of Drinking Water, PO Box 47828, Olympia WA 98504-7828, (360)236-3100 or (800)521-0323, http://www.doh.wa.gov/ehp/dw/Programs/water_sys_design.htm. (3-30-07)

t. Submersible Motors: Application, Installation, Maintenance (Franklin Electric AIM manual), Franklin Electric, Bluffton, Indiana 46714, (800)348-2420, http://www.franklin-electric.com/aim-manual.aspx. (3-30-07)

u. Guidance Manual for Compliance with the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources (March 1991 Edition), U.S. Environmental Protection Agency, http://

water.epa.gov/lawsregs/rulesregs/sdwa/swtr/upload/guidsws.pdf. (3-30-07)

v. Standard Methods for the Examination of Water and Wastewater, a joint publication of the American Public Health Association, the Water Environment Federation, and the American Water Works Association, 6666 West Quincy Avenue, Denver, CO 80235, 800-926-7337, www.standardmethods.org (3-30-07)

w. F480-02 Standard Specification for Thermoplastic Well Casing Pipe and Couplings Made in Standard Dimension ratios (SDR), SCH 40 and SCH 80, American Society for Testing and Materials (ASTM Standard F480-02). (3-30-07)

x. "Idaho Standards for Public Works Construction," 2005 Edition, and subsequent revisions, Local Highway Technical Assistance Council, 3330 Grace Street, Boise, ID 83605, (208)344-0565. (4-11-06)

y. Memorandum of Understanding between the Idaho Department of Environmental Quality and the Idaho Division of Building Safety Plumbing Bureau, Idaho Department of Environmental Quality, 1410 North Hilton, Boise, Idaho 83706, www.deq.idaho.gov. (3-30-07)

z. Idaho General Safety and Health Standards (IGSHS), available from the Idaho Division of Building Safety, 1090 E. Watertower St., Meridian, Idaho 83642, (208)334-3950, http://dbs.idaho.gov/. (3-30-07)

aa. Implementation Guidance for the Long Term 2 Enhanced Surface Water Treatment Rule, Idaho Department of Environmental Quality, 1410 North Hilton, Boise, Idaho 83706, www.deq.idaho.gov. (4-2-08)

bb. Implementation Guidance for the Stage 2 Disinfectants and Disinfection Byproducts Rule, Idaho Department of Environmental Quality, 1410 North Hilton, Boise, Idaho 83706, www.deq.idaho.gov. (4-2-08)

cc. Implementation Guidance for the Ground Water Rule, Idaho Department of Environmental Quality, 1410 North Hilton, Boise, Idaho 83706, www.deq.idaho.gov. (5-8-09)

dd. AWWA Recommended Practice for Backflow Prevention and Cross-Connection Control (M14), available from the AWWA, 6666 West Quincy Avenue, Denver, Colorado 80235, Telephone (800) 926-7337. (4-7-11)

03. Precedence. In the event of conflict or inconsistency between the language in these rules and that found in any document incorporated by reference, these rules shall prevail. (4-11-06)

003. DEFINITIONS.

The definitions set forth in 40 CFR 141.2, revised as of July 1, 2006, are herein incorporated by reference except for the definition of the terms "action level," "disinfection," "noncommunity water system," and "person." (4-2-08)

01. Action Level. The concentration of lead or copper in water that determines, in some cases, whether a water system must install corrosion control treatment, monitor source water, replace lead service lines, or undertake a public education program. (12-10-92)

02. Administrator. The Administrator of the United States Environmental Protection Agency.(4-5-00)

03. Annual Samples. Samples that are required once per calendar year. (12-10-92)

04. Annular Opening. As used in well construction, this term refers to the nominal inside diameter of the borehole minus the outside diameter of the casing divided by two (2). (3-30-07)

05. Aquifer. A geological formation of permeable saturated material, such as rock, sand, gravel, etc., capable of yielding an economic quantity of water to wells and springs. (5-3-03)

06. Available. Based on system size, complexity, and source water quality, a properly licensed operator must be on site or able to be contacted as needed to initiate the appropriate action in a timely manner. (4-6-05)

07. Average Day Demand. The volume of water used by a system on an average day based on a one (1) year period. See also the definition of Water Demand in these rules. (5-8-09)

08. Backflow. The reverse from normal flow direction in a plumbing system or water system caused by back pressure or back siphonage. (12-10-92)

09. Bag Filters. Pressure-driven separation devices that remove particulate matter larger than one (1) micrometer using an engineered porous filtration media. They are typically constructed of a non-rigid, fabric filtration media housed in a pressure vessel in which the direction of flow is from the inside of the bag to the outside. (4-2-08)

10. Bank Filtration. A water treatment process that uses a well to recover surface water that has naturally infiltrated into ground water through a river bed or bank(s). Infiltration is typically enhanced by the hydraulic gradient imposed by a nearby pumping water supply or other well(s). (4-2-08)

11. Board. The Idaho Board of Environmental Quality. (5-3-03)

12. Capacity. The capabilities required of a public drinking water system in order to achieve and maintain compliance with these rules and the requirements of the federal Safe Drinking Water Act. It is divided into three (3) main elements: (4-5-00)

a. Technical capacity means the system has the physical infrastructure to consistently meet drinking water quality standards and treatment requirements and is able to meet the requirements of routine and emergency operations. It further means the ability of system personnel to adequately operate and maintain the system and to otherwise implement technical knowledge. Training of operator(s) is required, as appropriate, for the system size and complexity. (4-6-05)

b. Financial capacity means the financial resources of the water system, including an appropriate budget; rate structure; cash reserves sufficient for current operation and maintenance, future needs and emergency situations; and adequate fiscal controls. (5-8-09)

c. Managerial capacity means that the management structure of the water system embodies the aspects of water system operations, including, but not limited to; (5-8-09)

i. Short and long range planning; (4-5-00)

ii. Personnel management; (4-5-00)

iii. Fiduciary responsibility; (4-5-00)

iv. Emergency response; (4-5-00)

v. Customer responsiveness; (4-5-00)

vi. Source water protection; (4-5-00)

vii. Administrative functions such as billing and consumer awareness; and (4-5-00)

viii. Ability to meet the intent of the federal Safe Drinking Water Act. (4-5-00)

13. Cartridge Filters. Pressure-driven separation devices that remove particulate matter larger than one (1) micrometer using an engineered porous filtration media. They are typically constructed as rigid or semi-rigid, self-supporting filter elements housed in pressure vessels in which flow is from the outside of the cartridge to the inside. (4-2-08)

14. Combined Distribution System. The interconnected distribution system consisting of the distribution systems of wholesale systems and of the consecutive systems that receive finished water. (4-2-08)

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15. Community Water System. A public water system which serves at least fifteen (15) service connections used by year-round residents or regularly serves at least twenty-five (25) year-round residents. See also the definition of a Public Drinking Water System in these rules. (5-8-09)

16. Components of Finished Water Storage. Storage is available to serve the system if the storage structure or facility is elevated sufficiently or is equipped with sufficient booster pumping capability to pressurize the system. Components of finished water storage are further defined as: (5-8-09)

a. Dead Storage. Storage that is either not available for use in the system or can provide only substandard flows and pressures. (3-30-07)

b. Effective Storage. Effective storage is all storage other than dead storage and is made up of the additive components described in Paragraphs c. through f. of this Subsection. (5-8-09)

c. Operational Storage. Operational storage supplies water when, under normal conditions, the sources are off. This component is the larger of; (3-30-07)

i. The volume required to prevent excess pump cycling and ensure that the following volume components are full and ready for use when needed; or (3-30-07)

ii. The volume needed to compensate for the sensitivity of the water level sensors. (3-30-07)

d. Equalization Storage. Storage of finished water in sufficient quantity to compensate for the difference between a water system's maximum pumping capacity and peak hour demand. (3-30-07)

e. Fire Suppression Storage. The water needed to support fire flow in those systems that provide it. (3-30-07)

f. Standby Storage. 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 (8) hours of operation at average day demand. (5-8-09)

17. Composite Correction Program (CCP). A systematic approach to identifying opportunities for improving the performance of water treatment and implementing changes that will capitalize on these opportunities. The CCP consists of two (2) elements: (4-5-00)

a. Comprehensive Performance Evaluation (CPE). A thorough review and analysis of a treatment plant's performance-based capabilities and associated administrative, operation, and maintenance practices. It is conducted to identify factors that may be adversely impacting a plant's capability to achieve compliance and emphasizes approaches that can be implemented without significant capital improvements. The CPE must consist of at least the following components: assessment of plant performance; evaluation of major unit processes; identification and prioritization of performance limiting factors; assessment of the applicability of comprehensive technical assistance; and preparation of a CPE report. (4-5-00)

b. Comprehensive Technical Assistance (CTA). The implementation phase that is carried out if the CPE results indicate improved performance potential. During the CTA phase, the system must identify and systematically address plant-specific factors. The CTA consists of follow-up to the CPE results, implementation of process control priority setting techniques, and maintaining long term involvement to systematically train staff and administrators. (4-5-00)

18. Compositing of Samples. The mixing of up to five (5) samples by the laboratory. (4-5-00)

19. Confining Layer. A nearly impermeable subsurface stratum which is located adjacent to one (1) or more aquifers and does not yield a significant quantity of water to a well. (5-3-03)

20. Confirmation Sample. A sample of water taken from the same point in the system as the original

sample and at a time as soon as possible after the original sample was taken. (12-10-92)

21. Connection. Each structure, facility, or premises which is connected to a water system, and which is or could be used for domestic purposes, is considered a single connection. A single family residence is considered to be a premises. Multi-family dwellings and apartment, condominium, and office complexes are considered single connections unless individual units are billed separately for water by the water system, in which case each such unit shall be considered a single connection. (4-7-11)

22. Consecutive System. A public water system that receives some or all of its finished water from one (1) or more wholesale systems. Delivery may be through a direct connection or through the distribution system of one (1) or more consecutive systems. (4-2-08)

23. Consumer. Any person served by a public water system. (12-10-92)

24. Consumer Confidence Report (CCR). An annual report that community water systems must deliver to their customers. The reports must contain information on the quality of the water delivered by the systems and characterize the risks (if any) from exposure to contaminants detected in the drinking water in an accurate and understandable manner. (4-5-00)

25. Contaminant. Any physical, chemical, biological, or radiological substance or matter in water. (12-10-92)

26. Cross Connection. Any actual or potential connection or piping arrangement between a public or a consumer's potable water system and any other source or system through which it is possible to introduce into any part of the potable water system used water, water from any source other than an approved public water system, industrial fluid, gas or substance other than the intended potable water with which the system is supplied. Cross connections include bypass arrangements, jumper connections, removable sections, swivel or change-over devices and other temporary or permanent devices which, or because of which "backflow" can or may occur. (10-1-93)

27. Dead End Main. A distribution main of any diameter and length that does not loop back into the distribution system. (3-30-07)

28. Dead Storage. Storage that is either not available for use in the system or can provide only substandard flows and pressures. See also the definition of Components of Finished Water Storage in these rules. (5-8-09)

29. Department. The Idaho Department of Environmental Quality. (12-10-92)

30. Director. The Director of the Department of Environmental Quality or his designee. (12-10-92)

31. Disinfection. Introduction of chlorine or other agent or process approved by the Department, in sufficient concentration or dosage, and for the time required to kill or inactivate pathogenic and indicator organisms. (3-30-07)

32. Disinfection Profile. A summary of daily Giardia lamblia inactivation through the drinking water treatment plant. The procedure for developing a disinfection profile is contained in 40 CFR 141.172 and 40 CFR 141.530-141.536. (5-3-03)

33. Distribution System. Any combination of pipes, tanks, pumps, and other equipment which delivers water from the source(s), treatment facility(ies), or a combination of source(s) and treatment facility(ies) to the consumer. Chlorination may be considered as a function of a distribution system. (5-8-09)

34. Drinking Water. Means "water for human consumption." (3-30-07)

35. Drinking Water System. All mains, pipes, and structures through which water is obtained and distributed, including wells and well structures, intakes and cribs, pumping stations, treatment plants, reservoirs, storage tanks and appurtenances, collectively or severally, actually used or intended for use for the purpose of

furnishing water for drinking or general domestic use. (12-10-92)

36. Dual Sample Set. A set of two (2) samples collected at the same time and same location, with one (1) sample analyzed for TTHM and the other sample analyzed for HAA5. Dual sample sets are collected for the purposes of conducting an Initial Distribution System Evaluation (40 CFR Part 141, Subpart U) and for determining compliance with the TTHM and HAA5 MCLs under the Stage 2 Disinfection Byproducts Requirements (40 CFR Part 141, Subpart V). (4-2-08)

37. DWIMS. Idaho Department of Environmental Quality Drinking Water Information Management System. Replaced by SDWISS April 2001. (3-15-02)

38. Effective Storage. Effective storage is all storage other than dead storage and is made up of the additive components described in Paragraphs c. through f. of the definition Components of Finished Water Storage in these rules. (5-8-09)

39. Enhanced Coagulation. The addition of sufficient coagulant for improved removal of disinfection byproduct precursors by conventional filtration treatment. Conventional filtration treatment is defined in 40 CFR 141.2. (5-3-03)

40. Enhanced Softening. The improved removal of disinfection byproduct precursors by precipitative softening. (4-5-00)

41. Equalization Storage. Storage of finished water in sufficient quantity to compensate for the difference between a water system's maximum pumping capacity and peak hour demand. See also the definition of Components of Finished Water Storage in these rules. (5-8-09)

42. Equivalent Dwelling Unit (EDU). A unit of measure that standardizes all land use types (housing, retail, office, etc.) to the level of demand created by a single-family detached housing unit within a water system. The demand for one (1) equivalent dwelling unit is equivalent to the amount of water provided to the average single-family detached housing unit within a water system. For example, a business designed to use three (3) times as much water as an average single-family detached housing unit would have a demand of three (3) equivalent dwelling units. (5-8-09)

43. Exemption. A temporary deferment of compliance with a maximum contaminant level or treatment technique requirement which may be granted only if the system demonstrates to the satisfaction of the Department that the system cannot comply due to compelling factors and the deferment does not cause an unreasonable risk to public health. (12-10-92)

44. Facility Plan. The facility plan for a public drinking water system describes the overall system, including sources of water, treatment processes and facilities, pumping stations and distribution piping, finished water storage, and waste disposal. It is a comprehensive planning document for infrastructure and includes a plan for the future of the system/facility, including upgrades and additions. It is usually updated on a regular basis due to anticipated or unanticipated growth patterns, regulatory requirements, or other infrastructure needs. A facility plan is sometimes referred to as a master plan or facilities planning study. In general, a facility plan is an overall system-wide plan as opposed to a project specific plan. (3-30-07)

45. Facility Standards and Design Standards. Facility standards and design standards are described in Sections 500 through 552 of these rules. Facility and design standards found in Sections 500 through 552 of these rules must be followed in the planning, design, construction, and review of public drinking water facilities. (3-30-07)

46. Fee Assessment. A charge assessed on public drinking water systems based on a rate structure calculated by system size. (10-1-93)

47. Filter Profile. A graphical representation of individual filter performance, based on continuous turbidity measurements or total particle counts versus time for an entire filter run, from startup to backwash inclusively, that includes an assessment of filter performance while another filter is being backwashed. (4-5-00)

48. Finished Water. Water that is introduced into the distribution system of a public water system and is intended for distribution and consumption without further treatment, except as necessary to maintain water quality in the distribution system (e.g., booster disinfection, addition of corrosion control chemicals). (4-2-08)

49. Finished Water Storage Structures or Facilities. Finished water storage structures or facilities are defined as: (5-8-09)

a. Above-ground storage structure or facility. A finished water storage structure or facility with a bottom elevation above normal ground surface. (5-8-09)

b. Ground-level storage structure or facility. A finished water storage structure or facility with a bottom elevation at normal ground surface. (5-8-09)

c. Partially buried storage structure or facility. A finished water storage structure or facility with a bottom elevation below normal ground surface and any portion of the structure or facility above normal ground surface. (5-8-09)

d. Below-ground storage structure or facility. A finished water storage structure or facility with a bottom elevation and top elevation below normal ground surface. (5-8-09)

50. Fire Flow Capacity. The water system capacity, in addition to maximum day demand, that is available for fire fighting purposes within the water system or distribution system pressure zone. Adequacy of the water system fire flow capacity is determined by the local fire authority. (3-30-07)

51. Fire Suppression Storage. The water needed to support fire flow in those systems that provide it. See also the definition of Components of Finished Water Storage in these rules. (5-8-09)

52. Fixture Protection. The practice of installing backflow prevention assemblies or devices to isolate one (1) or more cross connections within a customer's facility. (5-8-09)

53. Flowing Stream. As used in the Long Term 2 Enhanced Surface Water Treatment Rule (40 CFR Part 141, Subpart W), this term means a course of running water flowing in a definite channel. (4-2-08)

54. GAC10. Granular activated carbon filter beds with an empty bed contact time of ten (10) minutes based on average day demand and a carbon reactivation frequency of every one hundred eighty (180) days, except that the reactivation frequency for GAC10 used as a best available technology for compliance with MCLs established in the Stage 2 Disinfection Byproducts Requirements (40 CFR Part 141, Subpart V) shall be one hundred twenty (120) days. (5-8-09)

55. GAC20. Granular activated carbon filter beds with an empty-bed contact time of twenty (20) minutes based on average daily flow and a carbon reactivation frequency of every two hundred forty (240) days. (4-2-08)

56. Ground Water System. A public water system which is supplied exclusively by a ground water source or sources. (12-10-92)

57. Ground Water Under the Direct Influence of Surface Water. Any water beneath the surface of the ground with significant occurrence of insects or other macroorganisms, algae, or large diameter pathogens such as Giardia lamblia or Cryptosporidium, or significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH which closely correlate to climatological or surface water conditions. Direct influence must be determined for individual sources in accordance with criteria established by the State. The State determination of direct influence may be based on site-specific measurements of water quality, documentation of well construction characteristics and geology with field evaluation, or a combination of water quality and documentation. (5-8-09)

58. Haloacetic Acids (Five) (HAA5). The sum of the concentrations in milligrams per liter of the haloacetic acid compounds (monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid,

and dibromoacetic acid) rounded to two (2) significant figures after addition. (4-5-00)

59. Health Hazards. Any condition which creates, or may create, a danger to the consumer's health. Health hazards may consist of, but are not limited to, design, construction, operational, structural, collection, storage, distribution, monitoring, treatment or water quality elements of a public water system. See also the definition of Significant Deficiency, which refers to a health hazard identified during a sanitary survey. (5-3-03)

60. Inorganic. Generally refers to compounds that do not contain carbon and hydrogen. (12-10-92)

61. Internal or In-Plant Isolation. The practice of installing backflow prevention assemblies to protect an area within a water customer's structure, facility, or premises from contaminating another part of the structure, facility, or premises. (4-7-11)

62. Laboratory Certification Reciprocity. Acceptance of a laboratory certification made by another state. Laboratory reciprocity may be granted to laboratories outside of Idaho after application, proof of home state certification, and EPA performance evaluation results are submitted and reviewed. Reciprocity must be renewed after a time specified by the Idaho Laboratory Certification Officer to remain valid. (4-5-00)

63. Lake/Reservoir. As used in the Long Term 2 Enhanced Surface Water Treatment Rule (40 CFR Part 141, Subpart W), this term means a natural or man-made basin or hollow on the Earth's surface in which water collects or is stored that may or may not have a current or single direction of flow. (4-2-08)

64. License. A physical document issued by the Idaho Bureau of Occupational Licenses certifying that an individual has met the appropriate qualifications and has been granted the authority to practice in Idaho under the provisions of Chapter 24, Title 54, Idaho Code. (4-6-05)

65. Locational Running Annual Average (LRAA). The average of sample analytical results for samples taken at a particular monitoring location during the previous four (4) calendar quarters, as set forth in the Stage 2 Disinfection Byproducts Requirements (40 CFR Part 141, Subpart V). (4-2-08)

66. Log. Logarithm to the base ten (10). (12-10-92)

67. Material Deviation. A change from the design plans that significantly alters the type or location of facilities, requires engineering judgment to design, or impacts the public safety or welfare. (4-11-06)

68. Material Modification. Those modifications of an existing public water system that are intended to increase system capacity or alter the methods or processes employed. Any project that adds source water to a system, increases the pumping capacity of a system, increases the potential population served by the system or the number of service connections within the system, adds new or alters existing drinking water system components, or affects the water demand of the system is considered to be increasing system capacity or altering the methods or processes employed. Maintenance and repair performed on the system and the replacement of valves, pumps, or other similar items with new items of the same size and type are not considered a material modification. (5-8-09)

69. Maximum Contaminant Level (MCL). The maximum permissible level of a contaminant in water which is delivered to any user of a public water system. (3-30-07)

70. Maximum Day Demand. The average rate of consumption for the twenty-four (24) hour period in which total consumption is the largest for the design year. See also the definition of Water Demand in these rules. (5-8-09)

71. Maximum Pumping Capacity. The pumping capacity with the largest source or pump out of service. (5-8-09)

72. Maximum Residual Disinfectant Level (MRDL). A level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap without an unacceptable possibility of adverse health effects. For chlorine and chloramines, a public water system is in compliance with the MRDL, when the running annual average of monthly averages of samples taken in the distribution system, computed quarterly, is less than or

equal to the MRDL. For chlorine dioxide, a public water system is in compliance with the MRDL when daily samples are taken at the entrance to the distribution system and no two (2) consecutive daily samples exceed the MRDL. MRDLs are enforceable in the same manner as maximum contaminant levels under Section 1412 of the Safe Drinking Water Act. There is convincing evidence that addition of a disinfectant is necessary for control of waterborne microbial contaminants. Notwithstanding the MRDLs listed in 40 CFR 141.65, operators may increase residual disinfectant levels of chlorine or chloramines (but not chlorine dioxide) in the distribution system to a level and for a time necessary to protect public health to address specific microbiological contamination problems caused circumstances such as distribution line breaks, storm runoff events, source water contamination, or cross-connections. (4-5-00)

73. Maximum Residual Disinfectant Level Goal (MRDLG). The maximum level of a disinfectant added for water treatment at which no known or anticipated adverse effect on the health of persons would occur, and which allows an adequate margin of safety. MRDLGs are nonenforceable health goals and do not reflect the benefit of the addition of the chemical for control of waterborne microbial contaminants. (4-5-00)

74. Membrane Filtration. A pressure or vacuum driven separation process in which particulate matter larger than one (1) micrometer is rejected by an engineered barrier, primarily through a size-exclusion mechanism, and which has a measurable removal efficiency of a target organism that can be verified through the application of a direct integrity test. This definition includes the common membrane technologies of microfiltration, ultrafiltration, nanofiltration, and reverse osmosis. (4-2-08)

75. Method Detection Limit (MDL). The lowest concentration which can be determined to be greater than zero with ninety-nine percent (99%) confidence, for a particular analytical method. (12-10-92)

76. New System. Any water system that meets, for the first time, the definition of a public water system provided in Section 1401 of the federal Safe Drinking Water Act (42 U.S.C. Section 300f). This includes systems that are entirely new construction and previously unregulated systems that are expanding. (4-5-00)

77. Noncommunity Water System. A public water system that is not a community water system. A non-community water system is either a transient noncommunity water system or a non-transient noncommunity water system. See also the definition of a Public Drinking Water System in these rules. (5-8-09)

78. Non-Potable Mains. The pipelines that collect and convey non-potable discharges from or to multiple service connections. (4-11-06)

79. Non-Potable Services. The pipelines that convey non-potable discharges from individual facilities to a connection with the non-potable main. This term also refers to pipelines that convey non-potable water from a pressurized irrigation system, reclaimed wastewater system, and other non-potable systems to individual consumers. (4-11-06)

80. Nontransient Noncommunity Water System. A public water system that is not a community water system and that regularly serves at least twenty-five (25) of the same persons over six (6) months per year. See also the definition of a Public Drinking Water System in these rules. (5-8-09)

81. Nuclear Facility. Factories, processing plants or other installations in which fissionable material is processed, nuclear reactors are operated, or spent (used) fuel material is processed, or stored. (12-10-92)

82. Operating Shift. That period of time during which water system operator decisions that affect public health are necessary for proper operation of the system. (4-5-00)

83. Operational Storage. Operational storage supplies water when, under normal conditions, the sources are off. This component is the larger of the volume required to prevent excess pump cycling and ensure that the following volume components are full and ready for use when needed or the volume needed to compensate for the sensitivity of the water level sensors. See also the definition of Components of Finished Water Storage in these rules. (5-8-09)

84. Owner/Purveyor of Water/Supplier of Water. The person, company, corporation, association, or

other organizational entity which holds legal title to the public water system, who provides, or intends to provide, drinking water to the customers, and who is ultimately responsible for the public water system operation. (5-8-09)

85. Peak Hour Demand. The highest hourly flow, excluding fire flow, that a water system or distribution system pressure zone is likely to experience in the design year. See also the definition of Water Demand in these rules. (5-8-09)

86. Person. A human being, municipality, or other governmental or political subdivision or other public agency, or public or private corporation, any partnership, firm, association, or other organization, any receiver, trustee, assignee, agent or other legal representative of the foregoing or other legal entity. (12-10-92)

87. Pesticides. Substances which meet the criteria for regulation pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended, and any regulations adopted pursuant to FIFRA. For example, pesticides include, but are not limited to insecticides, fungicides, rodenticides, herbicides, and algaecides. (12-10-92)

88. Plant. A physical facility where drinking water or wastewater is treated or processed. (3-30-07)

89. Plant Intake. The works or structures at the head of a conduit through which water is diverted from a source (e.g., river or lake) into the treatment plant. (4-2-08)

90. Point of Use (POU) Treatment Device. A treatment device applied to a single tap used for the purpose of reducing contaminants in drinking water at that one tap. (3-30-07)

91. Point of Use (POU) Treatment System. A collection of POU treatment devices. (3-30-07)

92. Potable Mains. Pipelines that deliver potable water to multiple service connections. (3-30-07)

93. Potable Services. Pipelines that convey potable water from a connection to the potable water main to individual consumers. (3-30-07)

94. Preliminary Engineering Report. The preliminary engineering report for a public drinking water system facility is a report that addresses specific portions of the system or facility for which modifications are being designed. Modifications may include, but are not limited to, significant changes to existing processes or facilities, system expansion, addition of treatment, or installation of other processes and facilities. This report addresses specific purpose and scope, design requirements, alternative solutions, costs, operation and maintenance requirements, and other requirements as described in Section 503. Preliminary engineering reports are generally project specific as opposed to an overall system-wide plan, such as a facility plan. However, the preliminary engineering report shall describe modifications to the facility plan that may be required as a result of the proposed project. (3-30-07)

95. Premises Isolation or Containment. The practice of separating the customer's structure, facility, or premises from the purveyor's system by means of a backflow prevention assembly installed on the service line before any distribution takes place. (4-7-11)

96. Presedimentation. A preliminary treatment process used to remove gravel, sand, and other particulate material from the source water through settling before the water enters the primary clarification and filtration processes in a treatment plant. (4-2-08)

97. Public Notice. The notification of public water system consumers of information pertaining to that water system including information regarding water quality or compliance status of the water system. (12-10-92)

98. Public Drinking Water System. A system for the provision to the public of water for human consumption through pipes or, after August 5, 1998, other constructed conveyances, if such system has at least fifteen (15) service connections, regardless of the number of water sources or configuration of the distribution system, or regularly serves an average of at least twenty-five (25) individuals daily at least sixty (60) days out of the year. Such term includes: any collection, treatment, storage, and distribution facilities under the control of the operator of such system and used primarily in connection with such system; and any collection or pretreatment storage facilities not

under such control which are used primarily in connection with such system. Such term does not include any "special irrigation district." A public water system is either a "community water system" or a "noncommunity water system" as further defined as: (5-8-09)

a. Community water system. A public water system which serves at least fifteen (15) service connections used by year-round residents or regularly serves at least twenty-five (25) year-round residents. (5-8-09)

b. Noncommunity water system. A public water system that is not a community water system. A non-community water system is either a transient noncommunity water system or a non-transient noncommunity water system. (5-8-09)

c. Nontransient noncommunity water system. A public water system that is not a community water system and that regularly serves at least twenty-five (25) of the same persons over six (6) months per year. (5-8-09)

d. Transient noncommunity public water system. A noncommunity water system which does not regularly serve at least twenty-five (25) of the same persons over six (6) months per year. (5-8-09)

99. Public Water System/Water System/System. Means "public drinking water system." (4-5-00)

100. Pump House. An above-grade structure containing important water system components, such as a well, hydropneumatic tank, booster pump, pump controls, flow meter, well discharge line, or a treatment unit. Pump houses are often called well houses in common usage, even though in modern construction these structures may not contain either a well or a pump. These terms are used interchangeably in national standards and trade publications. (3-30-07)

101. Qualified Licensed Professional Engineer (QLPE). A professional engineer licensed by the state of Idaho; qualified by education or experience in the specific technical fields involved in these rules; and retained or employed by a city, county, quasi-municipal corporation, or regulated public utility for the purposes of plan and specification review. (5-8-09)

102. Quasi-Municipal Corporation. A public entity, other than community government, created or authorized by the legislature to aid the state in, or to take charge of, some public or state work for the general welfare. For the purpose of these rules, this term refers to drinking water districts. (4-11-06)

103. Regulated Public Utility. For the purpose of these rules, any public water system that falls under the jurisdiction of the Idaho Public Utilities Commission and is subject to the rules thereof. (3-30-07)

104. Repeat Compliance Period. Any subsequent compliance period after the initial compliance period. (12-10-92)

105. Responsible Charge (RC). Responsible Charge means active, daily on-site or on-call responsibility for the performance of operations or active, on-going, on-site, or on-call direction of employees and assistants. (5-8-09)

106. Responsible Charge Operator. An operator of a public drinking water system, designated by the system owner, who holds a valid license at a class equal to or greater than the drinking water system classification, who is in responsible charge of the public drinking water system. (4-6-05)

107. Reviewing Authority. For those projects requiring preconstruction approval by the Department, the Department is the reviewing authority. For those projects allowing for preconstruction approval by others, pursuant to Subsection 504.03.b. of these rules, the qualified Idaho licensed professional engineer (QLPE) is also the reviewing authority. (5-8-09)

108. Sampling Point. The location in a public water system from which a sample is drawn. (12-10-92)

109. Sanitary Defects. Any faulty structural condition which may allow the water supply to become contaminated. (12-10-92)

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110. Sanitary Survey. An onsite review of the water source, facilities, equipment, operation and maintenance of a public water system for the purpose of evaluating the adequacy of such source, facilities, equipment, operation and maintenance for producing and distributing safe drinking water. The sanitary survey will include, but is not limited to the following elements: (4-5-00)

a. Source; (4-5-00)

b. Treatment; (4-5-00)

c. Distribution system; (4-5-00)

d. Finished water storage; (4-5-00)

e. Pumps, pump facilities, and controls; (4-5-00)

f. Monitoring and reporting and data verification; (4-5-00)

g. System management and operation; and (4-5-00)

h. Operator compliance with state requirements. (4-5-00)

111. SDWIS-State. An acronym that stands for "Safe Drinking Water Information System-State Version." It is a software package developed under contract to the U.S. Environmental Protection Agency and used by a majority of U.S. states to collect, maintain, and report data about regulated public water systems. See also the definition of DWIMS. (5-3-03)

112. Sewage. The water-carried human or animal waste from residences, buildings, industrial establishments or other places, together with such ground water infiltration and surface water as may be present. (3-30-07)

113. Significant Deficiency. As identified during a sanitary survey, any defect in a system's design, operation, maintenance, or administration, as well as any failure or malfunction of any system component, that the Department or its agent determines to cause, or have potential to cause, risk to health or safety, or that could affect the reliable delivery of safe drinking water. See also the definition of Health Hazards. (5-3-03)

114. Simple Water Main Extension. New or replacement water main(s) that require plan and specification review by a qualified licensed professional engineer (QLPE) or by the Department per these rules and that is connected to existing water main facilities and does not require the addition of system components designed to control quantity or pressure, including, but not limited to, booster stations, new sources, pressure reducing stations, or reservoirs; and continues to provide the pressure and quantity requirements of Subsection 552.01. (4-7-11)

115. Special Irrigation District. An irrigation district in existence prior to May 18, 1994 that provides primarily agricultural service through a piped water system with only incidental residential or similar use where the system or the residential or similar users of the system comply with the exclusion provisions in Section 1401(4)(B)(i)(II) or (III) of the Safe Drinking Water Act. (4-6-05)

116. Spring. A source of water which flows from a laterally percolating water table's intersection with the surface or from a geological fault that allows the flow of water from an artesian aquifer. (12-10-92)

117. Standby Storage. Standby storage provides a measure of reliability or safety factor should sources fail or when unusual conditions impose higher than anticipated demands. See also the definition of Components of Finished Water Storage in these rules. (5-8-09)

118. Substantially Modified. The Department shall consider a public water system to be substantially modified when, as the result of one (1) or more projects, there is a combined increase of twenty-five percent (25%) or more above the system's existing configuration in the population served or number of service connections, the total

length of transmission and distribution water mains, and the peak or average water demand. (5-8-09)

119. Substitute Responsible Charge Operator. An operator of a public drinking water system who holds a valid license at a class equal to or greater than the drinking water system classification, designated by the system owner to replace and to perform the duties of the responsible charge operator when the responsible charge operator is not available or accessible. (4-6-05)

120. Surface Water System. A public water system which is supplied by one (1) or more surface water sources or ground water sources under the direct influence of surface water. Also called subpart H systems in applicable sections of 40 CFR Part 141. (4-5-00)

121. SUVA (Specific Ultraviolet Absorption). SUVA means Specific Ultraviolet Absorption at two hundred fifty-four (254) nanometers (nm), an indicator of the humic content of water. It is a calculated parameter obtained by dividing a sample's ultraviolet absorption at a wave length of two hundred fifty-four (254) nm (UV254) (in m=1) by its concentration of dissolved organic carbon (DOC) (in mg/l). (3-30-07)

122. Total Organic Carbon (TOC). Total organic carbon in mg/l measured using heat, oxygen, ultraviolet irradiation, chemical oxidants, or combinations of these oxidants that convert organic carbon to carbon dioxide, rounded to two (2) significant figures. (4-5-00)

123. Total Trihalomethanes (TTHM). The sum of the concentration in milligrams per liter of the trihalomethane compounds (trichloromethane [chloroform], dibromochloromethane, bromodichloromethane and tribromomethane [bromoform]), rounded to two (2) significant figures. (4-2-08)

124. Transient Noncommunity Public Water System. A noncommunity water system which does not regularly serve at least twenty-five (25) of the same persons over six (6) months per year. See also the definition of a Public Drinking Water System in these rules. (5-8-09)

125. Treatment Facility. Any place(s) where a public drinking water system or nontransient noncommunity water system alters the physical or chemical characteristics of the drinking water. Chlorination may be considered as a function of a distribution system. (4-5-00)

126. Turbidity. A measure of the interference of light passage through water, or visual depth restriction due to the presence of suspended matter such as clay, silt, nonliving organic particulates, plankton and other microscopic organisms. Operationally, turbidity measurements are expressions of certain light scattering and absorbing properties of a water sample. Turbidity is measured by the Nephelometric method. (12-10-92)

127. Two-Stage Lime Softening. A process in which chemical addition and hardness precipitation occur in each of two (2) distinct unit clarification processes in series prior to filtration. (4-2-08)

128. Uncovered Finished Water Storage Facility. A tank, reservoir, or other facility that is directly open to the atmosphere and used to store water that will undergo no further treatment to reduce microbial pathogens except residual disinfection. (4-2-08)

129. Unregulated Contaminant. Any substance that may affect the quality of water but for which a maximum contaminant level or treatment technique has not been established. (12-10-92)

130. Use Assessment. For the purpose of obtaining a waiver from certain monitoring requirements, a use assessment is an evaluation as to whether synthetic organic contaminants are being or have been used, manufactured, transported, stored, or disposed of in the watershed for surface water or the zone of influence for ground water. (5-8-09)

131. Variance. A temporary deferment of compliance with a maximum contaminant level or treatment technique requirement which may be granted only when the system demonstrates to the satisfaction of the Department that the raw water characteristics prevent compliance with the MCL or requirement after installation of the best available technology or treatment technique and the determent does not cause an unreasonable risk to public health. (12-10-92)

132. Very Small Public Drinking Water System. A Community or Nontransient Noncommunity Public Water System that serves five hundred (500) persons or less and has no treatment other than disinfection or has only treatment which does not require any chemical treatment, process adjustment, backwashing or media regeneration by an operator (e.g. calcium carbonate filters, granular activated carbon filters, cartridge filters, ion exchangers). (4-5-00)

133. Volatile Organic Chemicals (VOCs). VOCs are lightweight organic compounds that vaporize or evaporate easily. (10-1-93)

134. Vulnerability Assessment. A determination of the risk of future contamination of a public drinking water supply. (12-10-92)

135. Waiver. (12-10-92)

a. For the purposes of these rules, except Sections 500 through 552, "waiver" means the Department approval of a temporary reduction in sampling requirements for a particular contaminant. (3-30-07)

b. For purposes of Sections 500 through 552, "waiver" means a dismissal of any requirement of compliance. (3-30-07)

c. For the purposes of Section 010, "waiver" means the deferral of a fee assessment for a public drinking water system. (10-1-93)

136. Wastewater. Any combination of liquid or water and pollutants from activities and processes occurring in dwellings, commercial buildings, industrial plants, institutions and other establishments, together with any ground water, surface water, and storm water that may be present; liquid or water that is chemically, biologically, physically or rationally identifiable as containing blackwater, gray water or commercial or industrial pollutants; and sewage. See IDAPA 58.01.16, "Wastewater Rules," for additional information. (4-7-11)

137. Water for Human Consumption. Water that is used by humans for drinking, bathing for purposes of personal hygiene (including hand-washing), showering, cooking, dishwashing, and maintaining oral hygiene. In common usage, the terms "culinary water," "drinking water," and "potable water" are frequently used as synonyms. (5-3-03)

138. Water Demand. The volume of water requested by system users to satisfy their needs. Water demand can be further categorized as: (5-8-09)

a. Average day demand. The volume of water used by a system on an average day based on a one (1) year period. (5-8-09)

b. Maximum day demand. The average rate of consumption for the twenty-four (24) hour period in which total consumption is the largest for the design year. (5-8-09)

c. Peak hour demand. The highest hourly flow, excluding fire flow, that a water system or distribution system pressure zone is likely to experience in the design year. (5-8-09)

139. Water Main. A pipe within a public water system which is under the control of the system operator and conveys water to two (2) or more service connections or conveys water to a fire hydrant. The collection of water mains within a given water supply is called the distribution system. (5-8-09)

140. Watershed. The land area from which water flows into a stream or other body of water which drains the area. (3-30-07)

141. Wholesale System. A public water system that treats source water as necessary to produce finished water and then delivers some or all of that finished water to another public water system. Delivery may be through a direct connection or through the distribution system of one (1) or more consecutive systems. (4-2-08)

004. COVERAGE.
40 CFR 141.3 is herein incorporated by reference. (10-1-93)

005. GENERAL PROVISIONS FOR WAIVERS, VARIANCES, AND EXEMPTIONS.
40 CFR 141.4, revised as of July 1, 2004, is herein incorporated by reference. (4-6-05)

01. Waivers. (12-10-92)

a. The Department may waive any requirement of Sections 500 through 552 that is not explicitly imposed by Idaho Statute, if it can be shown to the satisfaction of the Department that the requirement is not necessary for the protection of public health, protection from contamination, and satisfactory operation and maintenance of a public water system. (3-30-07)

b. The Department may at its discretion waive the requirements outlined in Section 010. (10-1-93)

c. Waiver of monitoring requirements is addressed in Subsection 100.07. (5-3-03)

02. Variances. (5-3-03)

a. General Variances. A variance may be granted by the Department if a public water system submits an application and demonstrates to the satisfaction of the Department that the following minimum requirements as required by 42 USC Section 1415(a) (The Safe Drinking Water Act) are met. These include but are not limited to: (5-3-03)

i. The system has installed the best available technology, treatment techniques, or other means to comply with the maximum contaminant level; and (5-3-03)

ii. Alternative sources of water are not reasonably available to the system. (5-3-03)

iii. For provisions of a national primary drinking water regulation which requires the use of a specific treatment technique with respect to a contaminant, the system must demonstrate that the technique is not necessary to protect the health of the system's customers. (5-3-03)

b. Small System Variances. A small system variance for a maximum contaminant level or treatment technique may be granted by the Department if a public water system submits an application and demonstrates to the satisfaction of the Department that the following minimum requirements as required by 42 USC Section 1415(e) are met. These include, but are not limited to: (5-3-03)

i. The system serves three thousand three hundred (3,300) or fewer persons; (5-3-03)

ii. If the system serves more than three thousand three hundred (3,300) persons but fewer than ten thousand (10,000) persons, the application shall be approved by the U.S. Environmental Protection Agency; (5-3-03)

iii. The U.S. Environmental Protection Agency has identified a variance technology that is applicable to the size and source water quality conditions of the public water system; (5-3-03)

iv. The system installs, operates and maintains such treatment technology, treatment technique, or other means; and (5-3-03)

v. The system cannot afford to comply with a national primary drinking water regulation in accordance with affordability criteria established by the state, including compliance through treatment, alternative source of water supply, restructuring or consolidation. (5-3-03)

03. Exemptions. An exemption may be granted by the Department if a public water system submits an application and demonstrates to the satisfaction of the Department that the following minimum requirements as required by 42 USC Section 1416(a) are met. These include but are not limited to: (5-3-03)

a. The system is unable to comply with a maximum contaminant level or treatment technique due to compelling factors, which may include economic factors; (5-3-03)

b. The system was in operation by the effective date of such contaminant level or treatment technique and no reasonable source of water is available to the system; or (5-3-03)

c. If the system was not in operation by the effective date of such contaminant level or treatment technique, then no reasonable alternative source of water is available to the system; and (5-3-03)

d. The granting of an exemption will not result in an unreasonable risk to health; (5-3-03)

e. Management or restructuring changes cannot reasonably be made to comply with the contaminant level or treatment technique to improve the quality of the drinking water; (5-3-03)

f. The system cannot meet the standard without capital improvements which cannot be completed prior to the date established pursuant to 42 USC Section 1412b(10); (5-3-03)

g. If the system needs financial assistance, the system has entered into an agreement to obtain such financial assistance; or (5-3-03)

h. The system has entered into an enforceable agreement to become a part of a regional public water system and is taking all practical steps to meet the standard. (5-3-03)

04. Conditions. A waiver, exemption or variance may be granted upon any conditions that the Department, in its discretion, determines are appropriate. Failure by the public water system to comply with any condition voids the waiver, variance or exemption. (12-10-92)

05. Public Hearing. The Department shall provide public notice and an opportunity for public hearing in the area served by the public water system before any exemption or variance under Section 005 is granted by the Department. At the conclusion of the hearing, the Department shall record the findings and issue a decision approving, denying, modifying, or conditioning the application. (5-3-03)

06. Exceptions. Any person aggrieved by the Department's decision on a request for a waiver, variance or exemption may file a petition for a contested case with the Board. Such petitions shall be filed with the Board, as prescribed in, IDAPA 58.01.23, "Rules of Administrative Procedure Before the Board of Environmental Quality." (3-15-02)

07. Surface Water Variances. Variances from the requirements of Sections 300 through 303 are not allowed. (4-5-00)

08. Surface Water Exemptions. Exemptions from 40 CFR 141.72(a)(3) and 40 CFR 141.72(b)(2), incorporated by reference herein, are not allowed. (10-1-93)

006. SITING REQUIREMENTS.

40 CFR 141.5 is herein incorporated by reference. (10-1-93)

007. DISAPPROVAL DESIGNATION.

The Department or its agent may assign a disapproved designation to a public water system when: (5-3-03)

01. Defects. There are design or construction defects, or some combination of design and construction defects; or (5-8-09)

02. Operating Procedures. Operating procedures constitute a health hazard; or (12-10-92)

03. Quality. Physical, chemical, microbiological or radiological quality does not meet the requirements of these rules; or (10-1-93)

04. **Monitoring**. The required monitoring as specified in these rules has not been conducted; or (10-1-93)

05. **Unapproved Source**. An unapproved source of drinking water is used or the system is interconnected with a disapproved water system. (12-10-92)

06. **Non-Payment of Annual Fee Assessment**. The annual drinking water system fee assessment is not paid as set forth in Section 010. (7-1-97)

07. **Public Notification**. The Department may require the owner of a water system that has been given a disapproval designation to notify the public. The manner, content, and timing of this notification will be determined by the Department. This requirement is in addition to any public notification requirements set forth in Section 150 that may also apply to the disapproved system. (5-3-03)

008. HEALTH HAZARDS.

01. **Prohibited**. (10-1-93)

a. No public water system, or portion of a public water system, shall constitute a health hazard, as determined by the Department and defined in Section 003 of these rules. (5-3-03)

b. No public water system, or portion of a public water system, shall create a condition which prevents, or may prevent, the detection of a health hazard, as determined by the Department. (5-3-03)

02. **Schedule**. Health hazards and conditions which prevent, or may prevent, the detection of a health hazard must be mitigated as required by the Department and terminated within a time schedule established by the Department. (5-3-03)

03. **Standards**. Design and construction revisions necessary to correct a health hazard or conditions which prevent, or may prevent, the detection of a health hazard, must be reviewed and approved by the Department, and comply with Sections 501 through 552, unless otherwise specified by the Department. (3-30-07)

009. MONITORING.

The Department may, in its discretion, alter the monitoring or sampling requirements for any contaminant otherwise specified in these rules if the Department determines that such alteration is necessary to adequately assess the level of such contamination. (10-1-93)

010. FEE SCHEDULE FOR PUBLIC DRINKING WATER SYSTEMS.

All regulated public drinking water systems shall pay an annual drinking water system fee. The fee shall be assessed to regulated public drinking water systems as provided in this section. (10-1-93)

01. **Effective Date**. Annual fees shall be paid for each fee year beginning October 1, 1993, and continuing for each succeeding year. (10-1-93)

02. **Fee Schedule**. (10-1-93)

a. Community and Nontransient noncommunity public drinking water systems shall pay an annual fee according to the following fee schedule:

Number of Connections	Fee
1 to 20	$100
21 to 184	$5 per connection, not to exceed a total of $735 per system
185 to 3,663	$4 per connection, not to exceed a total of $10,988 per system

Number of Connections	Fee
3,664 or more	$3 per connection

(7-1-97)

b. The annual fee for transient public drinking water systems is twenty-five dollars ($25). (10-1-93)

c. New public drinking water systems formed after October 1 will not pay a fee until the following October. (10-1-93)

03. Fee Assessment. (10-1-93)

a. An annual fee assessment will be generated for each community and nontransient noncommunity public drinking water system listed in the Department's Safe Drinking Water Information System (SDWISS). (3-15-02)

b. Community and nontransient noncommunity public drinking water systems will be notified each year of the official number of connections listed in SDWISS. Systems will have at least one (1) month to notify the Department if the number of connections listed in SDWISS is not in agreement with the system's records. (3-15-02)

c. The official number of connections listed in SDWISS following each yearly update, as required in Subsection 010.03.b., will be used to calculate the annual fee for community and nontransient noncommunity public drinking water systems for the next fee year of October 1 through September 30. (3-15-02)

04. Billing. An annual fee shall be assessed and a statement will be mailed to all community, nontransient noncommunity, and transient public drinking water systems listed in SDWISS by the Department on or before September 1 of each year. (3-15-02)

05. Payment. (10-1-93)

a. Payment of the annual fee shall be due on October 1, unless it is a Saturday, a Sunday, or a legal holiday, in which event the payment shall be due on the successive business day. Fees paid by check or money order shall be made payable to the Idaho Department of Environmental Quality and sent to 1410 North Hilton Street, Boise, ID 83706-1255. (10-1-93)

b. If a public water system consists of two hundred fifty (250) connections or more, the system may request to divide its annual fee payment into equal monthly or quarterly installments by submitting a request to the Department on the proper request form provided with the initial billing statement. (10-1-93)

c. The Department will notify applicable systems, in writing, of approval or denial of a requested monthly or quarterly installment plan within ten (10) business days of the Department receiving such a request. (10-1-93)

d. If a public water system has been approved to pay monthly installments then each installment shall be due by the first day of each month, unless it is a Saturday, a Sunday, or a legal holiday, in which event the installment shall be due on the successive business day. (10-1-93)

e. If a public water system has been approved to pay quarterly installments then each installment shall be due by the first day of the month of each quarter (October 1, January 1, April 1, and July 1), unless it is a Saturday, a Sunday, or a legal holiday, in which event the installment shall be due on the first successive business day. (10-1-93)

06. Delinquent Unpaid Fees. A public water system will be delinquent in payment if its annual fee assessment has not been received by the Department by November 1; or if having first opted to pay monthly or quarterly installments, its monthly or quarterly installment has not been received by the Department by the last day of the month in which the monthly or quarterly payment is due. (10-1-93)

07. Suspension of Services and Disapproval Designation. (7-1-97)

a. For any system delinquent in payment of fee assessed under Subsections 010.02 and 010.06, in excess of ninety (90) days, technical services provided by the Department may be suspended except for the following: (7-1-97)

i. Issuance of monitoring waivers; (7-1-97)

ii. Review and processing of engineering reports; and (7-1-97)

iii. Review of plans and specifications for design and construction as set forth in Sections 501 through 552. (3-30-07)

b. For any system delinquent in payment of fee assessed under Subsections 010.02 and 010.06, in excess of one hundred and eighty (180) days, the Department may suspend all technical services provided by the Department including any of the following: (7-1-97)

i. Review and processing of engineering reports; (7-1-97)

ii. Review of plans and specifications for design and construction as set forth in Sections 501 through 552; (3-30-07)

iii. Renewal of monitoring waivers; or (7-1-97)

iv. Granting of new monitoring waivers. (7-1-97)

c. For any system delinquent in payment of fee assessed under Subsections 010.02 and 010.06, in excess of one hundred and eighty (180) days, the Department may disapprove the public water system pursuant to Subsection 007.06. (7-1-97)

08. Reinstatement of Suspended Services and Approval Status. For any public water system for which delinquency of fee payment, pursuant to Subsection 010.07, has resulted in the suspension of technical services, the disapproval of a public water system, or both, continuation of technical services, reinstatement of public water system approval, or both, will occur upon payment of delinquent annual fee assessments. (5-8-09)

09. Enforcement Action. Nothing in Section 010 waives the Department's right to undertake an enforcement action at any time, including seeking penalties, as provided in Section 39-108, Idaho Code. (7-1-97)

10. Responsibility to Comply. Subsection 010.07 shall in no way relieve any system from its obligation to comply with all applicable state and federal drinking water statutes, rules, regulations, or orders. (7-1-97)

011. CONTINUITY OF SERVICE.

01. Transfer of Ownership. No owner shall transfer system ownership without providing written notice to the Department and all customers. Notification shall include a schedule for transferring responsibilities and identification of the new owner. (5-3-03)

02. Maintenance of Standards. The system transferring ownership shall ensure that all health related standards are met during transfer and shall ensure that water rights, operation and maintenance manuals, and all other pertinent documentation is transferred to the new owner. (5-3-03)

012. WRITTEN INTERPRETATIONS.

The Department of Environmental Quality may have written statements in the form of guidance and policy documents that pertain to the interpretation of the rules of this chapter. Such written statements may be inspected and copies obtained at the Department of Environmental Quality, 1410 North Hilton, Boise, Idaho 83706-1255. (5-3-03)

013. USE OF GUIDANCE.
Guidance documents referenced in these rules are to be used to assist both designers and reviewers in determining a reasonable way to achieve compliance with the rules. Nothing in these rules makes the use of a particular guidance or guidance document mandatory. If the plans and specifications comply with applicable facility and design standards as set out in these rules, Section 39-118, Idaho Code, requires that the Department not substitute its judgment for that of the design engineer concerning the manner of compliance. If the design engineer needs assistance as to how to comply with a particular rule, the design engineer may use the referenced guidance documents for that assistance. However, the design engineer may also use other guidance or provide documentation to substantiate his or her own professional judgment. (5-8-09)

014. ADMINISTRATIVE PROVISIONS.
Persons may be entitled to appeal agency actions authorized under these rules pursuant to IDAPA 58.01.23, "Rules of Administrative Procedure Before the Board of Environmental Quality." (3-15-02)

015. CONFIDENTIALITY OF RECORDS.
Information obtained by the Department under these rules is subject to public disclosure pursuant to the provisions of Chapter 3, Title 9, Idaho Code. Information submitted under a trade secret claim may be entitled to confidential treatment by the Department as provided in Section 9-342A, Idaho Code, and IDAPA 58.01.21, "Rules Governing the Protection and Disclosure of Records in the Possession of the Department of Environmental Quality." (3-15-02)

016. OFFICE HOURS -- MAILING ADDRESS AND STREET ADDRESS.
The state office of the Department of Environmental Quality and the office of the Board of Environmental Quality are located at 1410 N. Hilton, Boise, Idaho 83706-1255, telephone number (208) 373-0502. The office hours are 8 a.m. to 5 p.m. Monday through Friday. (4-11-06)

017. -- 049. (RESERVED)

050. MAXIMUM CONTAMINANT LEVELS AND MAXIMUM RESIDUAL DISINFECTANT LEVELS.

01. Inorganic Contaminants. (10-1-93)

a. 40 CFR 141.11, revised as of July 1, 2001, is herein incorporated by reference. (3-15-02)

b. 40 CFR 141.62, revised as of July 1, 2004, is herein incorporated by reference. (4-6-05)

c. The maximum contaminant level for cyanide is two-tenths milligram per liter (0.2 mg/l). (12-10-92)

02. Organic Contaminants. 40 CFR 141.61 is herein incorporated by reference. except that the best available technology (BAT) treatment listed in 40 CFR 141.61(b) shall be changed to reflect that packed tower aeration will not be listed for toxaphene but will be listed for toluene. (4-2-08)

03. Turbidity. 40 CFR 141.13 is herein incorporated by reference. (10-1-93)

04. Radionuclides. 40 CFR 141.66, revised as of July 1, 2001, is herein incorporated by reference. (3-15-02)

05. Microbiological Contaminants. 40 CFR 141.63, revised as of July 1, 2001, is herein incorporated by reference. (3-15-02)

06. Maximum Contaminant Levels for Disinfection Byproducts. 40 CFR 141.64, revised as of July 1, 2006, is herein incorporated by reference. (4-2-08)

07. Maximum Residual Disinfectant Levels. 40 CFR 141.65, revised as of July 1, 2002, is herein incorporated by reference. (5-3-03)

08. Effective Dates. 40 CFR Part 141, revised as of July 1, 2004, is herein incorporated by reference. Effective date information provided in 40 CFR 141.6 and 40 CFR 141.60 is applicable. (4-6-05)

051. -- 099. (RESERVED)

100. MONITORING AND ANALYTICAL REQUIREMENTS.

01. Microbiological Contaminant Sampling and Analytical Requirements. (10-1-93)

a. 40 CFR 141.21, revised as of July 1, 2010, is herein incorporated by reference. (4-7-11)

b. The Department may reduce the total coliform monitoring frequency for community water systems serving twenty-five (25) to one thousand (1000) persons, as specified in 40 CFR 141.21(a)(2) and Subsection 100.01. The Department may allow community water systems serving twenty-five (25) to one thousand (1000) persons to reduce the total coliform monitoring frequency to once per quarter when; (12-10-92)

i. The system submits a written request to the Department in advance of the requirement; and (12-10-92)

ii. There has been no history of total coliform contamination in it's current configuration; and (10-1-93)

iii. The system has been in compliance with the total coliform monitoring requirements for the last three (3) years; and (12-10-92)

iv. A sanitary survey has been conducted within the past five (5) years which indicates to the Department that there are no deficiencies which could affect microbial quality; and (12-10-92)

v. The system uses only a ground water source that is protected. (12-10-92)

c. The Department may reduce the total coliform monitoring frequency for noncommunity water systems serving less than one thousand (1000) persons as specified in 40 CFR 141.21(a)(3)(i) and Subsection 100.01 of this rule. The Department may allow noncommunity water systems serving less than one thousand (1000) persons to reduce the total coliform monitoring frequency to once per year when; (12-10-92)

i. The system submits a written request to the Department in advance of the requirement; and (12-10-92)

ii. No coliforms have been detected in the last three (3) years of monitoring; and (12-10-92)

iii. The system has been in compliance with the total coliform monitoring requirements for the last three (3) years; and (12-10-92)

iv. A sanitary survey has been conducted within the past five (5) years which indicates to the Department that there are no deficiencies which could affect microbial quality; and (12-10-92)

v. The system uses only a ground water source that is protected. (12-10-92)

d. The Department may reduce the total coliform monitoring frequency for noncommunity water systems serving more than one thousand (1000) persons during any month the system serves one thousand (1000) persons or fewer as specified in 40 CFR 141.21(a)(3)(ii) and Subsection 100.01. The Department will allow noncommunity water systems serving more than one thousand (1000) persons to reduce the total coliform monitoring frequency for any month the system serves one thousand (1000) persons or fewer, down to a minimum of one (1) sample per year, provided; (10-1-93)

i. The system submits a written request to the Department in advance of the requirement; and (12-10-92)

ii. No coliforms have been detected in the last three (3) years of monitoring; and (12-10-92)

iii. The system has been in compliance with the total coliform monitoring requirements for the last three (3) years; and (12-10-92)

iv. A sanitary survey has been conducted within the past five (5) years which indicates that there are no deficiencies which could effect microbial quality; and (12-10-92)

v. The system uses only a ground water source that is protected. (12-10-92)

e. A system must collect repeat samples within twenty-four (24) hours of notification of positive results as specified in 40 CFR 141.21(b) and Subsection 100.01. The Department may allow a system to delay collection of repeat samples if the system; (12-10-92)

i. Identifies the cause of the contamination; (12-10-92)

ii. Is making progress towards correcting the problem; (12-10-92)

iii. Submits a written request to delay collecting repeat samples and a written statement admitting an acute MCL violation; (12-10-92)

iv. Follows public notification requirements specified under 40 CFR Part 141, Subpart Q, revised as of July 1, 2006, for Tier 1 MCL violations including notice for consumers to boil their water; (4-2-08)

v. Continues to collect the regularly scheduled number of routine samples; (12-10-92)

vi. Collects all repeat samples immediately following correction of the problem; and (12-10-92)

vii. Collects five (5) routine samples during the month following the end of the violation as required under 40 CFR 141.21 (b)(5), unless waived as allowed under that paragraph. (12-10-92)

02. Turbidity Sampling and Analytical Requirements. 40 CFR 141.22, revised as of July 1, 2001, is herein incorporated by reference. (3-15-02)

03. Inorganic Chemical Sampling and Analytical Requirements. 40 CFR 141.23, revised as of July 1, 2010, is herein incorporated by reference. (4-7-11)

04. Organic Chemicals Other Than Total Trihalomethanes, Sampling and Analytical Requirements. 40 CFR 141.24, revised as of July 1, 2010, is herein incorporated by reference. (4-7-11)

05. Analytical Methods for Radioactivity. 40 CFR 141.25, revised as of July 1, 2010, is herein incorporated by reference. (4-7-11)

06. Monitoring Frequency and Compliance Requirements for Radioactivity in Community Water Systems. 40CFR 141.26, revised as of July 1, 2001, is herein incorporated by reference. (3-15-02)

07. Monitoring Waivers. 40 CFR 141.23(b) 141.23(c), 141.24(f), 141.24(h), revised as of July 1, 2009, are herein incorporated by reference. (4-7-11)

a. Waivers from sampling requirements in Subsections 100.03, 100.04, 200.01, 503.03.k.i. and 503.03.k.ii. may be available to all systems for all contaminants except nitrate, nitrite, and disinfection byproducts and are based upon a vulnerability assessment, use assessment, the analytical results of previous sampling, or some combination of vulnerability assessment, use assessment, and analytical results. (4-7-11)

b. There are two (2) general types of monitoring waivers: (12-10-92)

i. Waivers based exclusively upon previous analytical data (12-10-92)

ii. Waivers based on a use or vulnerability assessment. (12-10-92)

c. Waivers are to be made by the Department on a contaminant specific basis and must be in writing. (12-10-92)

d. Vulnerability assessments may be conducted by the Department, the water system, or a third party organization. The Department shall approve or disapprove all vulnerability assessments in writing. (12-10-92)

e. Water systems which do not receive waivers shall sample at the required initial and repeat monitoring frequencies. (12-10-92)

f. If a system elects to request a waiver from monitoring, it shall do so in writing at least sixty (60) days prior to the required monitoring deadline date. (10-1-93)

08. Initial Monitoring Schedule. In addition to the requirements specified in 40 CFR 141.23, revised as of July 1, 2004, 40 CFR 141.24, revised as of July 1, 2004, and 40 CFR 141.40, revised as of July 1, 2001, initial monitoring must be completed according to the following schedule unless otherwise specified by the Department: (4-6-05)

a. Public water systems serving more than one hundred (100) people must conduct initial monitoring before January 1, 1995 except that: (10-1-93)

i. Initial monitoring for nitrate and nitrite must be completed before January 1, 1994 for all surface water sources serving transient noncommunity public water systems and for all ground water sources serving any public water system. (10-1-93)

ii. Initial monitoring for nitrate and nitrite must be completed before April 1, 1993 for all surface water sources serving community or nontransient noncommunity public water systems. (10-1-93)

iii. Initial monitoring required under 40 CFR 141.23(c) must be completed before January 1, 1994 for all surface water sources serving community or nontransient noncommunity public water systems. (10-1-93)

b. Public water systems serving one hundred (100) or less people must conduct initial monitoring before January 1, 1996 except that: (10-1-93)

i. Initial monitoring for nitrate and nitrite must be completed before January 1, 1994 for all surface water sources serving transient noncommunity public water systems and for all ground water sources serving a public water system. (10-1-93)

ii. Initial monitoring for nitrate and nitrite must be completed before April 1, 1993 for all surface water sources serving community or nontransient noncommunity public water systems. (10-1-93)

iii. Initial monitoring required under 40 CFR 141.23(c) must be completed before January 1, 1994 for all surface water sources serving community or nontransient noncommunity public water systems. (10-1-93)

09. Alternate Analytical Techniques. 40 CFR 141.27 is herein incorporated by reference. (10-1-93)

10. Approved Laboratories. 40 CFR 141.28, revised as of July 1, 2007, is herein incorporated by reference. All analyses conducted pursuant to these rules, except those listed below, shall be performed in laboratories certified or granted reciprocity by the Idaho Department of Health and Welfare, Bureau of Laboratories, as provided in IDAPA 16.02.13, "Rules Governing Certification of Idaho Water Quality Laboratories." The following analyses may be performed by any person acceptable to the Department of Environmental Quality: (5-8-09)

a. pH; (12-10-92)

b. Turbidity (Nephelometric method only); (12-10-92)

c. Daily analysis for fluoride; (12-10-92)

d. Temperature; (5-8-09)

e. Disinfectant residuals, except ozone, which shall be analyzed using the Indigo Method or an acceptable automated method pursuant to Subsection 300.05.c.; (5-8-09)

f. Alkalinity; (5-8-09)

g. Calcium; (5-8-09)

h. Conductivity; (5-8-09)

i. Silica; and (5-8-09)

j. Orthophosphate. (5-8-09)

11. Consecutive Water System. 40 CFR 141.29 is herein incorporated by reference. (10-1-93)

12. Total Trihalomethane Sampling, Analytical and Other Requirements. 40 CFR Part 141, Subpart L, revised as of July 1, 2010, is herein incorporated by reference. (4-7-11)

101. -- 149. (RESERVED)

150. REPORTING, PUBLIC NOTIFICATION, RECORDKEEPING.

01. Reporting Requirements. 40 CFR 141.31, revised as of July 1, 2001, is herein incorporated by reference. (3-15-02)

02. Public Notification. 40 CFR Part 141, Subpart Q, revised as of July 1, 2007, is herein incorporated by reference. (5-8-09)

03. Record Maintenance. 40 CFR 141.33, revised as of July 1, 2006, is herein incorporated by reference. (4-2-08)

04. Unregulated Contaminant Reporting and Public Notification. 40 CFR 141.35, revised as of July 1, 2003, is herein incorporated by reference. (3-20-04)

05. Reporting and Record Keeping for the Interim Enhanced Surface Water Treatment Rule. 40 CFR 141.175, revised as of July 1, 2002, is herein incorporated by reference. (5-3-03)

06. Reporting and Record Keeping Requirements for the Disinfectants and Disinfectant Byproducts Rule. 40 CFR 141.134, revised as of July 1, 2002, is herein incorporated by reference. (5-3-03)

151. CONSUMER CONFIDENCE REPORTS.
40 CFR Part 141, Subpart O, revised as of July 1, 2008, is herein incorporated by reference. (5-8-09)

152. -- 199. (RESERVED)

200. SPECIAL REGULATIONS.

01. Inorganic and Organic Chemical Special Monitoring. 40 CFR 141.40 is herein incorporated by reference. (10-1-93)

02. Sodium Special Monitoring. 40 CFR 141.41 is herein incorporated by reference. (10-1-93)

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03. Special Monitoring for Corrosively Characteristics. 40 CFR 141.42 is herein incorporated by reference. (10-1-93)

04. Lead Prohibition. 40 CFR 141.43, revised as of July 1, 2000, is herein incorporated by reference. (3-30-01)

201. -- 249. (RESERVED)

250. MAXIMUM CONTAMINANT LEVEL GOALS AND MAXIMUM RESIDUAL DISINFECTION LEVEL GOALS.

01. Organic Contaminants. 40 CFR 141.50 is herein incorporated by reference. (10-1-93)

02. Inorganic Contaminants. 40 CFR 141.51, revised as of July 1, 2004, is herein incorporated by reference. (4-6-05)

03. Microbiological Contaminants. 40 CFR 141.52, revised as of July 1, 1999, is herein incorporated by reference. (4-5-00)

04. Maximum Contaminant Level Goals for Disinfection Byproducts. 40 CFR 141.53, revised as of July 1, 2006, is herein incorporated by reference. (4-2-08)

05. Maximum Residual Disinfectant Level Goals for Disinfectants. 40 CFR 141.54, revised as of July 1, 2002, is herein incorporated by reference. (5-3-03)

06. Radionuclides. 40 CFR 141.55, revised as of July 1, 2001, is herein incorporated by reference. (3-15-02)

251. -- 299. (RESERVED)

300. FILTRATION AND DISINFECTION.

01. General Requirements. 40 CFR 141.70, revised as of July 1, 2002, is herein incorporated by reference. Each public water system using a surface water source or ground water source directly influenced by surface water shall be operated by personnel, as specified in Sections 553 and 554, who have met state requirements for licensing of water system operators. (4-6-05)

02. Filtration. 40 CFR 141.73, revised as of July 1, 2002, is herein incorporated by reference. (4-7-11)

a. Each system which provides filtration treatment shall submit engineering evaluations, other documentation, or some combination of engineering evaluations and other documentation as required by the Department to demonstrate ongoing compliance with these rules. (4-7-11)

b. The Department will establish filtration removal credit on a system-by-system basis. Unless otherwise demonstrated to the satisfaction of the Department, the maximum log removal credit allowed for filtration is as follows:

Maximum Log Removal		
Filtration Type	**Giardia**	**Viruses**
Conventional	2.5	2.0
Direct	2.0	1.0
Slow sand	2.0	2.0

Maximum Log Removal		
Filtration Type	**Giardia**	**Viruses**
Diatomaceous earth	2.0	1.0
Membrane	3.0	1.0
Alternate technology	2.0	0

(4-7-11)

c. Filtration removal credit shall be granted for filtration treatment provided the system is: (4-7-11)

i. Operated in accordance with the Operations Plan specified in Subsection 552.03.a.; and (4-7-11)

ii. The system is in compliance with the turbidity performance criteria specified under 40 CFR 141.73; and (4-7-11)

iii. Coagulant chemicals must be added and coagulation and flocculation unit process must be used at all times during which conventional and direct filtration treatment plants are in operation; and (4-7-11)

iv. Slow sand filters are operated at a rate not to exceed one-tenth (0.1) gallons per minute per square foot; and (4-7-11)

v. Diatomaceous earth filters are operated at a rate not to exceed one point five (1.5) gallons per minute per square foot. (4-7-11)

03. Criteria for Avoiding Filtration. 40 CFR 141.71, revised as of July 1, 2002, is herein incorporated by reference. (4-7-11)

04. Disinfection. 40 CFR 141.72 is herein incorporated by reference. (10-1-93)

a. In addition to the disinfection requirements in 40 CFR 141.72, each system with a surface water source or ground water source directly influenced by surface water shall maintain a minimum of at least two-tenths (0.2) parts per million of chlorine in the treated water after an actual contact time of at least thirty (30) minutes at peak hour demand before delivery to the first customer. (5-8-09)

b. The Department may allow a system to utilize automatic shut-off of water to the distribution system whenever total disinfectant residual is less than two-tenths (0.2) mg/l rather than provide redundant disinfection components and auxiliary power as required in 40 CFR 141.72(a)(2). An automatic water shut-off may be used if the system demonstrates to the satisfaction of the Department that, at all times, a minimum of twenty (20) psi pressure and adequate fire flow can be maintained in the distribution system when water delivery is shut-off to the distribution system and, at all times, minimum Giardia lamblia and virus inactivation removal rates can be achieved prior to the first customer. (12-10-92)

c. Each system which provides filtration treatment must provide disinfection treatment such that filtration plus disinfection provide at least ninety-nine and nine tenths percent (99.9%) inactivation/removal of Giardia lamblia cysts and ninety-nine and ninety-nine one hundredths percent (99.99%) inactivation/removal of viruses as specified in 40 CFR 141.72 and Section 300. However, in all cases the disinfection portion of the treatment train shall be designed to provide not less than five tenths (0.5) log Giardia inactivation, irrespective of the Giardia removal credit awarded to the filtration portion of the treatment train. (5-8-09)

05. Analytical and Monitoring Requirements. 40 CFR 141.74, revised as of July 1, 2010, is herein incorporated by reference. (4-7-11)

a. Each public water system which provides filtration treatment shall monitor as follows: (12-10-92)

i. Each day the system is in operation, the purveyor shall determine the total level of inactivation of Giardia lamblia cysts and viruses achieved through disinfection based on CT99.9 values provided in 40 CFR 141.74(b)(3) (Tables 1.1 through 1.6, 2.1 and 3.1). (12-10-92)

ii. At least once per day, the system shall monitor the following parameters to determine the total inactivation ratio achieved through disinfection: (12-10-92)

(1) Temperature of the disinfected water at each residual disinfectant concentration sampling point; and (12-10-92)

(2) If using chlorine, the pH of the disinfected water at each chlorine residual sampling point. (12-10-92)

(3) The disinfectant contact time, "T," must be determined each day during peak hour demand. Disinfectant contact time, "T," in pipelines used for Giardia lamblia and virus inactivation shall be calculated by dividing the internal volume of the pipe by the peak hour flow rate through that pipe. Disinfectant contact time, "T," for all other system components used for Giardia lamblia and virus inactivation shall be determined by tracer studies or equivalent methods. (5-8-09)

(4) The residual disinfectant concentrations at each residual disinfectant sampling point at or before the first customer, must be determined each day during peak hour demand, or at other times approved by the Department. (5-8-09)

iii. The purveyor may demonstrate to the Department, based on a Department approved on-site disinfection challenge study protocol, that the system is achieving disinfection requirements specified in Subsection 300.03 utilizing CT99.9 values other than those specified in 40 CFR 141.74(b)(3) (Tables 2.1 and 3.1) for ozone, chlorine dioxide, and chloramine. (10-1-93)

iv. The total inactivation ratio shall be calculated as follows: (12-10-92)

(1) If the system applies disinfectant at only one (1) point, the system shall determine the total inactivation ratio by either of the two (2) following methods: (12-10-92)

(a) One inactivation ratio (CTcalc/CT99.9) is determined at/or before the first customer during peak hour demand; or (5-8-09)

(b) Sequential inactivation ratios are calculated between the point of disinfectant application and a point at or before the first customer during peak hour demand. The following method must be used to calculate the total inactivation ratio: (5-8-09)

(i) Step 1: Determine (CTcalc/CT99.9) for each sequence. (12-10-92)

(ii) Step 2: Add the (CTcalc/CT99.9) values for all sequences. The result is the total inactivation ratio. (12-10-92)

(2) If the system uses more than one point of disinfectant application at or before the first customer, the system must determine the CT value of each disinfection sequence immediately prior to the next point of disinfectant application during peak hour demand. The sum of the (CTcalc/CT99.9) values from all sequences is the total inactivation ratio. (CTcalc/CT99.9) must be determined by the methods described in 40 CFR 141.74(b)(4)(i)(B). (5-8-09)

v. Log removal credit for disinfection shall be determined by multiplying the total inactivation ratio by three (3). (12-10-92)

vi. The Department may reduce the CT monitoring requirements specified under Section 300, for any system which demonstrates that the required inactivation levels are consistently exceeded. Reduced CT monitoring shall be allowed only where the reduction in monitoring will not endanger the health of consumers served by the

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water system. (12-10-92)

b. Residual disinfectant concentrations for ozone must be measured using the Indigo Method, or automated methods may be used if approved as provided for in 40 CFR 141.74(a)(5) and Subsection 300.05. Automated methods for ozone measurement must be approved by the Department. (4-6-05)

c. As provided for in 40 CFR 141.74(b), the Department may specify interim monitoring requirements for systems notified by the Department or U.S. Environmental Protection Agency that filtration treatment must be installed. Until filtration is installed, systems shall conduct monitoring for turbidity and disinfectant residuals as follows unless otherwise specified by the Departments; (12-10-92)

i. Disinfectant residual concentrations entering the distribution system shall be measured at the following minimum frequencies, and samples must be taken at evenly spaced intervals throughout the workday.

Minimum Frequencies	
Population	**Samples/day**
Less than 500	1
501 - 1000	2
1,001 - 2,500	3
Greater than 2501	4

(12-10-92)

ii. Turbidity shall be measured at least once per day at the entry point to the distribution system. (12-10-92)

iii. The Department may, at its discretion, reduce the turbidity monitoring frequency for any noncommunity system which demonstrates to the satisfaction of the Department: (12-10-92)

(1) A free chlorine residual of two-tenths (0.2) part per million is maintained throughout the distribution system; (12-10-92)

(2) The water source is well protected; (12-10-92)

(3) The total coliform MCL is not exceeded; and (12-10-92)

(4) No significant health risk is present. (12-10-92)

d. The Department may allow systems with surface water sources or ground water sources under the direct influence of surface water, to substitute continuous turbidity monitoring for grab sample monitoring as specified in 40 CFR 141.74(b)(2) and 40 CFR 141.74(c)(1) and Subsection 300.05. The Department may allow continuous turbidity monitoring provided the continuous turbidimeter is operated, maintained, standardized and calibrated per the manufacturers recommendations. For purposes of determining compliance with turbidity performance criteria, discrete values must be recorded every four (4) hours water is supplied to the distribution system. (10-1-93)

e. The Department may allow systems using both a surface water source(s), or ground water source(s) under the direct influence of surface water, and one (1) or more ground water sources, to measure disinfectant residual at points other than the total coliform sampling points, as specified in 40 CFR 141.74(b)(6)(i) and 40 CFR 141.74(c)(3)(i) and Subsection 300.05. The Department may allow alternate sampling points provided the system submits an acceptable alternate monitoring plan to the Department in advance of the monitoring requirement. (10-1-93)

f. The Department may allow a reduced turbidity monitoring frequency for systems using slow sand filtration or technology other than conventional, direct, or diatomaceous earth filtration, as specified in 40 CFR 141.74(c)(1) and Subsection 300.05. To be considered for a reduced turbidity monitoring frequency, a system must submit a written request to the Department in advance of the monitoring requirement. (12-10-92)

06. Reporting and Recordkeeping. 40 CFR 141.75, revised as of July 1, 2001, is herein incorporated by reference. (3-15-02)

a. As provided in 40 CFR 141.75(a), revised as of July 1, 2001, and Section 300, the Department may establish interim reporting requirements for systems notified by the Department or U.S. Environmental Protection Agency that filtration treatment must be installed as specified in 40 CFR 141.75(a), revised as of July 1, 2001, and as referred to in Subsection 300.06. Until filtration treatment is installed, systems required to install filtration treatment shall report as follows: (3-15-02)

i. The purveyor shall immediately report to the Department via telephone or other equally rapid means, but no later than the end of the next business day, the following information: (12-10-92)

(1) The occurrence of a waterborne disease outbreak potentially attributable to that water system; (12-10-92)

(2) Any turbidity measurement which exceeds five (5) NTU; and (12-10-92)

(3) Any result indicating that the disinfectant residual concentration entering the distribution system is below two-tenths (0.2) mg/l free chlorine. (12-10-92)

ii. The purveyor shall report to the Department within ten (10) days after the end of each month the system serves water to the public the following monitoring information using a Department-approved form: (12-10-92)

(1) Turbidity monitoring information; and (12-10-92)

(2) Disinfectant residual concentrations entering the distribution system. (12-10-92)

iii. Personnel qualified under Subsection 300.01 shall complete and sign the monthly report forms submitted to the Department as required in Subsection 300.06. (12-10-92)

b. In addition to the reporting requirements in 40 CFR 141.75(b), revised as of July 1, 2001, pertaining to systems with filtration treatment, each public water system which provides filtration treatment must report the level of Giardia lamblia and virus inactivation/removal achieved each day by filtration and disinfection. (5-8-09)

07. Recycle Provisions. 40 CFR 141.76, revised as of July 1, 2002, is herein incorporated by reference. (5-3-03)

a. The Department shall evaluate recycling records kept by water systems pursuant to 40 CFR 141.76 during sanitary surveys, comprehensive performance evaluations, or other inspections. (5-3-03)

b. The Department may require a system to modify recycling practices if it can be shown that these practices adversely affect the ability of the system to meet surface water treatment requirements. (5-3-03)

301. ENHANCED FILTRATION AND DISINFECTION - SYSTEMS SERVING TEN THOUSAND OR MORE PEOPLE.

This Section incorporates, 40 CFR Part 141, Subpart P, of the National Primary Drinking Water Regulations, known as the Interim Enhanced Surface Water Treatment Rule. (4-5-00)

01. General Requirements. 40 CFR 141.170, revised as of July 1, 2002, is herein incorporated by reference. (5-3-03)

02. Criteria for Avoiding Filtration. 40 CFR 141.171, revised as of July 1, 2002, is herein incorporated by reference. (5-3-03)

03. Disinfection Profiling and Benchmarking. 40 CFR 141.172, revised as of July 1, 2002, is herein incorporated by reference. (5-3-03)

04. Filtration. 40 CFR 141.173, revised as of July 1, 2002, is herein incorporated by reference. (5-3-03)

05. Filtration Sampling Requirements. 40 CFR 141.174, revised as of July 1, 2002, is herein incorporated by reference. (5-3-03)

302. SANITARY SURVEYS FOR SYSTEMS USING SURFACE WATER OR GROUND WATER UNDER THE DIRECT INFLUENCE OF SURFACE WATER.
The Department shall conduct a sanitary survey of all public water systems which use surface water or ground water under the direct influence of surface water. (4-5-00)

01. Frequency. For noncommunity water systems, a sanitary survey shall be conducted every five (5) years. For community water systems, a sanitary survey shall be conducted every three (3) years, except that a community water system that has been determined to have outstanding performance, according to criteria established by the Department, may have a sanitary survey conducted every five (5) years. (4-5-00)

02. Report. A report describing the results of the sanitary survey will be provided to the water system. (4-5-00)

a. As part of the sanitary survey report or as an independent action, the Department shall provide written notice to the water system describing any significant deficiency within thirty (30) days after the Department identifies the significant deficiency. The notice may specify corrective actions and deadlines for completion of corrective actions. (5-8-09)

b. The Department may, at its discretion, provide this written notice at the time of the sanitary survey. (5-8-09)

03. Consultation with the Department. Public water systems shall consult with the Department prior to taking specific corrective actions in response to significant deficiencies identified during a sanitary survey, unless such corrective actions are specified in detail by the Department in its written notification under Subsection 302.02. (5-8-09)

04. Violation. Failure to address significant deficiencies identified in a sanitary survey that are within the control of the public water system and its governing body shall constitute a violation of these rules. (4-5-00)

303. SANITARY SURVEYS FOR PUBLIC WATER SYSTEMS USING GROUND WATER.
The Department shall conduct a sanitary survey of all public water systems that use ground water. (5-8-09)

01. Frequency. For non-community water systems, a sanitary survey shall be conducted every five (5) years. For community water systems, a sanitary survey shall be conducted every three (3) years, except as provided below. (5-8-09)

a. A community water system may have a sanitary survey conducted every five (5) years if the system provides at least a four (4)-log treatment of viruses (using inactivation, removal, or a Department approved combination of 4-log inactivation and removal) before or at the first customer for all of its ground water sources. (5-8-09)

b. A community water system may have a sanitary survey conducted every five (5) years if it has an outstanding performance record, as determined by the Department and documented in previous sanitary surveys, and has no history of Total Coliform Rule MCL or monitoring violations under Subsection 100.01.a. since the last

sanitary survey. (5-8-09)

02. Report. A report describing the results of the sanitary survey shall be provided to the water system. (5-8-09)

a. As part of the sanitary survey report or as an independent action, the Department shall provide written notice to the water system describing any significant deficiency within thirty (30) days after the Department identifies the significant deficiency. The notice may specify corrective actions and deadlines for completion of corrective actions. (5-8-09)

b. The Department may, at its discretion, provide this written notice at the time of the sanitary survey. (5-8-09)

03. Significant Deficiencies. For each of the eight (8) elements of a sanitary survey of a ground water system, the following deficiencies shall in all cases be considered significant for the purposes of the notice required in Subsection 303.02. Decisions about the significance of other deficiencies identified during the sanitary survey shall be at the Department's discretion, as indicated in the Department's sanitary survey protocol. (5-8-09)

a. Source: Lack of a sanitary well cap as specified in Subsection 511.06.b. (5-8-09)

b. Treatment: Chemical addition is not flow proportioned or lacks emergency shut-off, as specified in Subsection 531.02.b.ii. (5-8-09)

c. Distribution system: No means for flushing dead end water mains, as specified in Subsection 542.09. (5-8-09)

d. Finished water storage: Roof leaking, as specified in Subsections 544.09 and 544.09.c. (5-8-09)

e. Pumps, pump facilities, and controls: No accessible check valve between pump and shut-off valve, as specified in Subsection 511.04. (5-8-09)

f. Monitoring, reporting, and data verification: Repeated failure to collect the required number and type of Total Coliform Rule samples during the most recent two (2) year period, as specified in Subsection 100.01.a. (5-8-09)

g. System management and operation: History of frequent depressurization in the distribution system in violation of Subsection 552.01. (5-8-09)

h. Operator compliance with state licensing requirements: Responsible charge operator is not licensed as required in Subsection 554.02. (5-8-09)

04. Consultation with the Department. Public water systems shall consult with the Department prior to taking specific corrective actions in response to significant deficiencies identified during a sanitary survey unless such corrective actions are specified in detail by the Department in its written notification under Subsection 303.02. (5-8-09)

05. Violation. Failure to address significant deficiencies identified in a sanitary survey that are within the control of the public water system and its governing body shall constitute a violation of these rules. (5-8-09)

304. COMPOSITE CORRECTION PROGRAM (CCP).

The Department may require a public water system to conduct a composite correction program, as defined in Section 003 of these rules, for the purpose of identifying and correcting deficiencies in water treatment and distribution. Failure to implement the performance improvement factors identified through the CCP constitutes a violation of these rules. (4-5-00)

305. -- 309. (RESERVED)

310. ENHANCED FILTRATION AND DISINFECTION - SYSTEMS SERVING FEWER THAN TEN THOUSAND PEOPLE.
40 CFR 141, Subpart T, revised as of July 1, 2002, is herein incorporated by reference. (5-3-03)

311. ENHANCED FILTRATION AND DISINFECTION FOR CRYPTOSPORIDIUM -- LONG TERM 2 ENHANCED SURFACE WATER TREATMENT RULE.
40 CFR Part 141, subpart W, revised as of July 1, 2010, is herein incorporated by reference. (4-7-11)

01. Cryptosporidium Treatment Credit for Approved Watershed Control Program. The Department shall award 0.5 (zero point five) logs cryptosporidium removal credit to systems that have a Department approved Watershed Control Program. Requirements for a watershed control program are set forth in 40 CFR 141, Subpart W. Guidance on how to develop a watershed control program and obtain Department approval is provided in "Implementation Guidance for the Long Term 2 Enhanced Surface Water Treatment Rule," as referenced in Section 002. (4-2-08)

02. Assessment of Significant Changes in the Watershed. As part of the sanitary survey process set forth in Section 302, the Department, or an agent approved by the Department, shall assess significant changes in the watershed of a surface water system that have occurred since the system conducted source water monitoring. If changes in the watershed have the potential to significantly increase contamination of the source water with cryptosporidium, the Department shall consult with the water system owner on follow-up actions that may be required under 40 CFR 141, Subpart W, including, but not limited to, source water monitoring and/or additional treatment requirements. "Implementation Guidance for the Long Term 2 Enhanced Surface Water Treatment Rule," as referenced in Section 002, provides a description of factors that will be considered by the Department when making an assessment of changes in the watershed. These factors include, but are not limited to the following: (4-2-08)

a. New NPDES permits or changes in existing NPDES permits that involve increased loading of contaminants. (4-2-08)

b. Changes in land use patterns. (4-2-08)

c. Changes in agricultural cropping, chemical application, or irrigation practices. (4-2-08)

d. Changes in other non-point discharge source activities (such as grazing, manure application, commercial or residential development). (4-2-08)

e. Stream or riverbed modifications. (4-2-08)

f. NPDES permit violations at wastewater treatment plants and confined animal feedlot operations. (4-2-08)

g. Dramatic natural events such as floods, forest fires, earthquakes, and landslides that may transport or expose contaminants. (4-2-08)

h. Prolonged drought conditions that may warrant special preparatory measures to minimize impacts from waste accumulations that are washed into source waters when precipitation returns. (4-2-08)

i. Status of the water system's emergency response plan. (4-2-08)

j. Accidental or illegal waste discharges and spills. (4-2-08)

312. -- 319. (RESERVED)

320. DISINFECTANT RESIDUALS, DISINFECTION BYPRODUCTS, AND DISINFECTION BYPRODUCT PRECURSORS.
This Section incorporates 40 CFR Part 141, Subpart L, of the National Primary Drinking Water Regulations, known as the Disinfectants and Disinfection Byproducts Rule. (4-5-00)

01. General Requirements. 40 CFR 141.130, revised as of July 1, 2006, is herein incorporated by reference. (4-2-08)

02. Analytical Requirements. 40 CFR 141.131, revised as of July 1, 2010, is herein incorporated by reference. DPD colorimetric test kits may be used to measure residual disinfectant concentrations for chlorine, chloramines, and chlorine dioxide. (4-7-11)

03. Monitoring Requirements. 40 CFR 141.132, revised as of July 1, 2006, is herein incorporated by reference. (4-2-08)

04. Compliance Requirements. 40 CFR 141.133, revised as of July 1, 2006, is herein incorporated by reference. (4-2-08)

05. Treatment Techniques for Control of Disinfection Byproduct (DBP) Precursors. 40 CFR 141.135, revised as of July 1, 2006, is herein incorporated by reference. (4-2-08)

321. INITIAL DISTRIBUTION SYSTEM EVALUATIONS.
40 CFR Part 141, Subpart U, revised as of July 1, 2006, is herein incorporated by reference. "Implementation Guidance for the Stage 2 Disinfectants and Disinfection Byproducts Rule," as referenced in Section 002, provides assistance to public water system owners and operators in understanding and achieving compliance with the requirements of 40 CFR 141, Subpart U. (4-2-08)

322. STAGE 2 DISINFECTION BYPRODUCTS REQUIREMENTS.
40 CFR Part 141, Subpart V, revised as of July 1, 2009, is herein incorporated by reference. "Implementation Guidance for the Stage 2 Disinfectants and Disinfection Byproducts Rule," as referenced in Section 002, provides assistance to public water system owners and operators in understanding and achieving compliance with the requirements of 40 CFR Part 141, Subpart V. (4-7-11)

323. GROUND WATER RULE.
40 CFR 141, Subpart S, revised as of July 1, 2010, is herein incorporated by reference. "Implementation Guidance for the Ground Water Rule," as referenced in Section 002, provides assistance to public water system owners and operators in understanding and achieving compliance with the requirements of 40 CFR 141, Subpart S. (4-7-11)

01. Monitoring and Compliance Requirements for Membranes. Ground water systems that use membrane filtration (or a combination of membrane filtration and disinfection) to achieve a four (4)-log inactivation/ removal of viruses at a ground water source must comply with the following requirements in addition to those specified in 40 CFR 141, Subpart S. (5-8-09)

a. All membrane skids or modules must undergo direct integrity testing a minimum of once each week that the source is contributing water to the distribution system. More frequent direct integrity testing may be required by the Department. Membrane systems shall contain sufficient redundancy to allow for offline direct integrity testing of all skids at the required interval while retaining the capability to supply peak hour demand to the water system. No membrane system shall have fewer than two (2) skids or modules. (5-8-09)

i. The direct integrity test shall have a resolution capable of detecting a response at the absolute molecular weight cut-off or other parameter that describes the exclusion capability of the membrane, as provided by the manufacturer. (5-8-09)

ii. The direct integrity test shall have a sensitivity capable of verifying four (4)-log virus removal (or a lesser Department approved log removal that achieves, in combination with disinfection, a total of four (4)-log virus treatment). (5-8-09)

b. Systems using membrane filtration shall submit a monthly operating report which includes the following information. (5-8-09)

i. Verification of direct integrity testing of each membrane skid or module and action taken in

response to a failure of the direct integrity test. (5-8-09)

ii. Records of any monitoring conducted for the purpose of indirect integrity verification. (5-8-09)

iii. Any additional information considered necessary by the Department on a case-specific basis to verify proper operation and maintenance of the membrane filtration process. (5-8-09)

02. Discontinuation of Treatment. Systems that wish to discontinue four (4)-log virus treatment at a ground water source must meet the following criteria. Ground water sources on which treatment has been discontinued shall be subject to the triggered source water monitoring requirements of 40 CFR 141, Subpart S. (5-8-09)

a. Demonstration that any known source of contamination has been removed. (5-8-09)

b. Demonstration that structural deficiencies of the well have been rehabilitated and no longer exist. (5-8-09)

c. Provide evidence that the well is drawing from a protected or confined aquifer. (5-8-09)

d. Submit results of one (1) year of monthly monitoring for a fecal indicator organism during which no positive results occurred. (5-8-09)

03. Chlorine Purging Prior to Triggered Source Sampling. 40 CFR 141.402(e), incorporated by reference into these rules at Section 323, requires that ground water source samples be collected at a location prior to any treatment. Pursuant to this requirement, systems that add chlorine to a source, either in the well bore or near enough to the wellhead that chlorinated water could backflow into the well, shall ensure that all chlorine residual has been purged prior to taking a triggered source water sample. This shall be accomplished by measuring chlorine residual in the source water until a reading of zero is obtained and be recorded in the space provided for chlorine residual on the sample submittal form. (5-8-09)

324. -- 349. (RESERVED)

350. CONTROL OF LEAD AND COPPER.

01. General Requirements. 40 CFR 141.80, revised as of July 1, 2008, is herein incorporated by reference. (5-8-09)

02. Applicability of Corrosion Control Treatment Steps to Small, Medium-Size, and Large Water Systems. 40 CFR 141.81, revised as of July 1, 2008, is herein incorporated by reference. (5-8-09)

03. Description of Corrosion Control Treatment Requirements. (12-1-92)

a. 40 CFR 141.82, revised as of July 1, 2008, is herein incorporated by reference. (5-8-09)

b. The Department may modify its determination of the optimal corrosion control treatment or optimal water quality control parameters where it concludes that such changes are necessary to optimize corrosion control treatment as specified in 40 CFR 141.82(h) and as referred to in Subsection 350.03. The Department may also modify its determination of the optimal corrosion control treatment or water quality control parameters where it finds such changes will provide equivalent or improved treatment in a manner which is simpler or less costly to operate. (12-10-92)

04. Source Water Treatment Requirements. 40 CFR 141.83, revised as of July 1, 2008, is herein incorporated by reference. The Department may modify its determination of optimal source treatment or maximum permissible lead and copper concentrations where it concludes that such changes are necessary as specified in 40 CFR 141.83(b)(6). (5-8-09)

05. Lead Service Line Replacement Requirements. 40 CFR 141.84, revised as of July 1, 2008, is

herein incorporated by reference. (5-8-09)

06. Public Education and Supplemental Monitoring Requirements. 40 CFR 141.85, revised as of July 1, 2008, is herein incorporated by reference. (5-8-09)

07. Monitoring Requirements for Lead and Copper in Tap Water. 40 CFR 141.86, revised as of July 1, 2008, is herein incorporated by reference. (5-8-09)

08. Monitoring Requirements for Water Quality Parameters. 40 CFR 141.87, revised as of July 1, 2008, is herein incorporated by reference. (5-8-09)

09. Monitoring Requirements for Lead and Copper in Source Water. 40 CFR 141.88, revised as of July 1, 2008, is herein incorporated by reference. (5-8-09)

10. Analytical Methods. 40 CFR 141.89, revised as of July 1, 2008, is herein incorporated by reference. (5-8-09)

11. Reporting Requirements. 40 CFR 141.90, revised as of July 1, 2008, is herein incorporated by reference. (5-8-09)

12. Recordkeeping Requirements. 40 CFR 141.91, revised as of July 1, 2008, is herein incorporated by reference. (5-8-09)

351. -- 399. (RESERVED)

400. SECONDARY MCLS.

01. Purpose. 40 CFR 143.1, revised as of July 1, 2003, is herein incorporated by reference. (3-20-04)

02. Definitions. 40 CFR 143.2, revised as of July 1, 2003, is herein incorporated by reference. (3-20-04)

03. Secondary Maximum Contaminant Levels. 40 CFR 143.3, revised as of July 1, 2003, is herein incorporated by reference. (3-20-04)

04. Monitoring. 40 CFR 143.4, revised as of July 1, 2010, is herein incorporated by reference. (4-7-11)

401. -- 449. (RESERVED)

450. USE OF NON-CENTRALIZED TREATMENT DEVICES.

01. Point of Entry Devices. 40 CFR 141.100, revised as of July 1, 1999, is herein incorporated by reference. (4-5-00)

02. Point of Use (POU) Treatment Devices. (3-30-07)

a. A public water system may use point of use (POU) treatment in order to achieve compliance with certain maximum contaminant levels (MCL) or treatment techniques, in accordance with Subsection 450.02.b., when the following conditions are met: (3-30-07)

i. A program for long-term operation, maintenance, and monitoring of the POU treatment system is approved by the Department, pursuant to Section 450.02.d. (3-30-07)

ii. The public water system or a vendor of POU treatment devices under contract with the public water system shall own, control, and maintain the POU treatment system to ensure proper operation and maintenance and compliance with the MCL or treatment technique. (3-30-07)

iii. Each POU treatment device is equipped with a mechanical warning mechanism to ensure that customers are automatically notified of operational problems. (3-30-07)

iv. The POU treatment device must be certified by an accredited American National Standards Institute (ANSI) certification body to meet applicable ANSI/National Sanitation Foundation (NSF) Standards. (3-30-07)

b. POU treatment devices shall not be used to achieve compliance with a MCL or treatment technique requirement for a microbial contaminant or an indicator of a microbial contaminant. Community water systems may not use POU treatment devices to achieve compliance with a nitrate MCL. (3-30-07)

c. The Department will waive the Subsection 551.04 plan and specification requirements relating to material modifications for the following systems only to the extent that the material modification proposed is limited to the installation or use of a POU treatment device(s): (5-8-09)

i. Community water systems serving two hundred (200) or fewer service connections. (3-30-07)

ii. Non-transient non-community water systems. (3-30-07)

iii. Transient non-community water systems. (3-30-07)

iv. Community water systems serving more than two hundred (200) service connections if approved by the Department through the waiver process outlined in Subsection 005.01.a. (3-30-07)

d. A public water system must obtain written approval by the Department before installation of a POU treatment device for the purpose of achieving compliance with a MCL or treatment technique. The public water system shall submit the following documentation for approval to the Department: (3-30-07)

i. Information identifying the public water system name and number, total number of service connections, contaminant(s) to be treated, type of POU treatment device to be installed, manufacturer and model number of the POU treatment device, type and function of the mechanical warning mechanism (performance indicator) on the POU treatment device, certification verification for ANSI/NSF, installer qualifications, and a proposed date for installation of the POU treatment device(s). (3-30-07)

ii. The manufacturer's specifications for the POU treatment device including demonstration that the POU treatment device is suited for the water chemistry of the public water system and contaminant(s) of concern and is of sufficient design and capacity for the particular application. (3-30-07)

iii. Information relating to how other drinking water dispensing units, such as instant hot water dispensers and refrigerator water and ice dispensers, whose primary function is to provide drinking water, will be provided with treated water. If water is transported from a POU treatment device to another drinking water dispensing unit, the conducting tube shall be of non-reactive material. (3-30-07)

iv. For non-transient non-community water systems and transient non-community water systems, demonstration that the drinking water dispensing units are located in areas adequate to protect public health. (3-30-07)

v. Demonstration that all POU treatment devices are owned, controlled, and maintained by the public water system or by a vendor of POU treatment devices under contract with the public water system. (3-30-07)

vi. A sampling plan identifying the location of all service connections and demonstrating how the system will ensure that all POU treatment devices are sampled for compliance with the contaminant(s) being treated during every compliance period or at a frequency designated by the state. (3-30-07)

vii. Documentation that a customer at each service connection has agreed to installation and use of a POU treatment device and has granted access for installation, maintenance, and sampling. (3-30-07)

viii. A plan that describes how the public water system will address any non-compliance with Subsection 450.02.d.vii. (3-30-07)

ix. A maintenance plan that demonstrates how on-going maintenance activities will be performed and on what frequency, including: frequency of treatment media replacements, frequency of POU treatment device replacements, periodic verification that the mechanical warning device is functional, schedule of planned maintenance activities, plan of how the system will address unscheduled maintenance problems, and a plan and method of waste disposal. (3-30-07)

x. Documentation that the system meets the current requirements for a certified operator pursuant to Section 554. (3-30-07)

xi. A plan for on-going education and outreach to the customers of the public water system, including rental customers, on POU treatment and health effects of the contaminant(s) of concern. (3-30-07)

xii. A plan for how the system will ensure real estate disclosures for the POU treatment system. (3-30-07)

xiii. A statement of recognition that failure to maintain compliance with the MCL, or the failure to operate and maintain compliance with a POU treatment system as approved by the Department, may necessitate installation of centralized treatment. (3-30-07)

e. Within thirty (30) days of installing the approved POU treatment system, the public water system shall notify the Department in writing that the POU treatment system was installed as approved by the Department. (3-30-07)

f. Within thirty (30) days of installing the approved POU treatment system, the public water system shall submit samples from each POU treatment device to a certified laboratory for the contaminant(s) being treated by the POU treatment device. The samples shall be used to demonstrate initial compliance with the MCL. (3-30-07)

g. The water system owner or operator must maintain records for a POU treatment system. Records shall be submitted to the Department at a frequency and in a format specified by the Department. Records to maintain shall include: (3-30-07)

i. Requirements of Subsection 450.02.d.; (3-30-07)

ii. All sampling performed on the POU treatment devices; (3-30-07)

iii. Maintenance logs and schedules; (3-30-07)

iv. Log of installed units; and (3-30-07)

v. Contracts, lease agreements, or other legal documents with vendors and consumers. (3-30-07)

03. Use of Bottled Water. 40 CFR 141.101, revised as of July 1, 1999, is herein incorporated by reference. (4-5-00)

451. TREATMENT TECHNIQUES.

01. General Requirements. 40 CFR 141.110 is herein incorporated by reference. (10-1-93)

02. Acrylamide, Epichlorohydrin. 40 CFR 141.111 is herein incorporated by reference. (12-10-92)

452. -- 499. (RESERVED)

500. FACILITY AND DESIGN STANDARDS: DEMONSTRATION OF TECHNICAL, FINANCIAL, AND MANAGERIAL CAPACITY OF PUBLIC DRINKING WATER SYSTEMS.

No person shall proceed, or cause to proceed, with construction of a new community or nontransient, noncommunity drinking water system until it has been demonstrated to the Department that the water system will have adequate technical, financial, and managerial capacity, as defined in Section 003 of these rules. With the exception of water sources, demonstration of capacity shall be submitted to the Department prior to or concurrent with the submittal of plans and specifications, as required in Section 39-118, Idaho Code, and Subsection 504.03 of these rules. Plans and specifications for water sources may be submitted to the Department prior to demonstration of capacity for the water system. The Department shall issue its approval of the new system capacity demonstration in writing. (5-8-09)

01. Technical Capacity. In order to meet this requirement, the public water system shall submit documentation to demonstrate the following: (4-5-00)

a. The system meets the relevant design, construction, and operating requirements of these rules; (5-8-09)

b. The system has an adequate and consistent source of water; (4-5-00)

c. A plan is in place to protect the water source and deal with emergencies; (4-5-00)

d. A plan exists for replacement or improvement of infrastructure as necessary; and (4-5-00)

e. The system has trained personnel with an understanding of the technical and operational characteristics of the system. (5-3-03)

02. Financial Capacity. A demonstration of financial capacity must include but is not limited to the following information: (4-5-00)

a. Documentation that organizational and financial arrangements are adequate to construct and operate the public water system in accordance with these rules. This information can be provided by submitting estimated construction, operation, and maintenance costs, letters of credit, or other access to financial capital through public or private sources and, if available, a certified financial statement; (5-8-09)

b. Demonstration of revenue sufficiency, that includes but is not limited to billing and collection procedures; a proposed rate structure which demonstrates the availability of operating funds, revenues for depreciation and reserves, and the ability to accrue a capital replacement fund. A preliminary operating budget shall be provided; and (5-8-09)

c. Adequate fiscal controls must be demonstrated. (4-5-00)

03. Managerial Capacity. In order to demonstrate adequate managerial capacity, the owner or operator of a new drinking water system shall submit at least the following information to the Department: (5-8-09)

a. Clear documentation of legal ownership and any plans that may exist for transfer of that ownership upon completion of construction or after a period of operation; (5-8-09)

b. The name, address, and telephone number of the person who will be accountable for ensuring that the water system is in compliance with these rules; (4-5-00)

c. The name, address, and telephone number of the responsible charge operator (5-8-09)

d. A description of the manner in which the water system will be managed. Information such as by-laws, restrictive covenants, articles of incorporation, or procedures and policy manuals which describe the management organizational structure shall be provided; (5-8-09)

e. A recommendation of staff qualifications, including training, experience, certification or licensing,

and continuing education; (5-8-09)

f. An explanation of how the water system will establish and maintain effective communications and relationships between the water system management, its customers, professional service providers, and any applicable regulatory agencies; and (4-5-00)

g. Evidence of planning for future growth, equipment repair and maintenance, and long term replacement of system components. (4-5-00)

04. Submittal Form. The Department shall provide a standard form to be used in preparing a new system capacity demonstration. The submittal form and general guidance on how to prepare a new system capacity document is provided in, "How to Demonstrate Financial, Technical, and Managerial Capacity in New Public Water Systems." This document may be requested from the Department and is available on the DEQ website at http://www.deq.idaho.gov. (5-8-09)

05. Expanding Systems. A public water system which comes into existence as a result of growth in population or number of service connections within a previously unregulated system will be considered a new system under these rules and is subject to all design, construction and operating requirements herein. (4-5-00)

06. Consolidation. In demonstrating new system capacity, the owner of the proposed new system must investigate the feasibility of obtaining water service from an established public water system. If such service is available, but the owner elects to proceed with an independent system, the owner must explain why this choice is in the public interest in terms of environmental protection, affordability to water users, and protection of public health. (4-5-00)

07. Exclusion. New public water systems which are public utilities as defined in Sections 61-104 (Corporation), 61-124 (Water System), 61-125 (Water Corporation), and 61-129 (Public Utility), Idaho Code, must meet the regulatory requirements of the Idaho Public Utilities Commission (IPUC) in Chapter 1, Title 61, Idaho Code, Public Utilities Law, and IDAPA 31.01.01, "Rules of Procedure of the Idaho Public Utilities Commission." Such water systems will not be required to meet any requirements of this Section which are in conflict with the provisions and requirements of the IPUC. (4-5-00)

501. FACILITY AND DESIGN STANDARDS: GENERAL DESIGN REQUIREMENTS FOR PUBLIC DRINKING WATER SYSTEMS.

Unless otherwise specified by the Department, the design of new drinking water systems, or modifications to existing, public drinking water systems, shall be in conformance with the facility and design standards set forth in Sections 006 and 500 through 552 of these rules. The following general design requirements shall apply as applicable for the type of water system and the treatment or other processes employed. (3-30-07)

01. Materials Used in Construction. Products that are used to construct public drinking water systems and have water contact surfaces shall conform to applicable AWWA standards and be certified by an accredited ANSI certification body to meet applicable ANSI/NSF standards, where products meeting such AWWA and ANSI/NSF standards exist. In the absence of such products, products meeting applicable product standards and acceptable to the reviewing authority may be selected. Corrosion control shall be taken into account during all aspects of public water system design. (5-8-09)

02. Additives Used in Operation. No chemical or other substance shall be added to drinking water, nor shall any process be utilized to treat drinking water, unless specifically approved by the Department. All chemicals shall conform to applicable AWWA standards and be certified by an accredited ANSI certification body to meet ANSI/NSF Standard 60, referenced in Subsection 002.02. (3-30-07)

03. Design Basis. The system, including the water source and treatment facilities, shall be designed to provide either peak hour demand of the system or maximum day demand plus equalization storage at the design year. (5-8-09)

04. Design of Treatment Facilities. Design of treatment facilities shall address: (3-30-07)

a. Functional aspects of facility layout and provisions for future facility expansion; (3-30-07)

b. Provision for expansion of waste treatment and disposal facilities; (3-30-07)

c. Roads constructed to provide year-round access by vehicles and equipment needed for repair and maintenance; (3-30-07)

d. Site grading and drainage; and (3-30-07)

e. Chemical delivery. (3-30-07)

05. Design of Buildings. The design of buildings that are a part of public drinking water systems shall provide for: (3-30-07)

a. Adequate ventilation, lighting, heating, and air conditioning; (3-30-07)

b. Adequate drainage; (3-30-07)

c. Dehumidification equipment, if necessary; (3-30-07)

d. Accessibility of equipment for operation, servicing, and removal; (3-30-07)

e. Flexibility and convenience of operation and safety of operators; and (3-30-07)

f. Separate room(s) for chemical storage and feed equipment that may be required based on type of chemicals and associated hazards. (5-8-09)

06. Electrical. Main switch gear electrical controls shall be located above grade, in areas not subject to flooding. All electrical work shall conform to the requirements of the National Electrical Code or to relevant state/ local codes. The National Electrical Code is available from the National Fire Protection Association, 1 Batterymarch Park, Quincy, Massachusetts 02169-7471, (617)770-3000. (5-8-09)

07. Reliability and Emergency Operation. New community water systems constructed after April 15, 2007 are required to have sufficient dedicated on-site standby power, with automatic switch-over capability, or standby storage so that water may be treated and supplied to pressurize the entire distribution system during power outages. During a power outage, the water system shall be able to meet the operating pressure requirements of Subsection 552.01.b. for a minimum of eight (8) hours at average day demand plus fire flow where provided. A minimum of eight (8) hours of fuel storage shall be located on site unless an equivalent plan is authorized by the Department. Standby power provided in a public drinking water system shall be coordinated with the standby power that is provided in the wastewater collection and treatment system. (5-8-09)

a. The Department may require the installation of standby power or storage facilities in existing systems if the frequency and duration of power outages a system experiences constitute a health hazard. (3-30-07)

b. Existing community public water systems that are substantially modified after April 15, 2007 shall meet the requirements of Subsection 501.07. in those portions of the system affected by the modifications. (3-30-07)

c. New sources and booster pumps intended to increase system capacity shall be provided with standby power or equivalent. (3-30-07)

d. For both new and existing public water systems, the Department may reduce the requirements of Subsection 501.07 if the system can demonstrate the capacity to adequately protect public health during a power outage. Any decision by the Department will be based on, but not limited to, the following considerations: (3-30-07)

i. An adequate emergency response and operation plan and the capacity to implement that plan. (3-30-07)

ii. The adequacy of the system's cross connection control program and the capacity to protect public health in the event of a system wide depressurization. (3-30-07)

iii. Demonstration of historical and projected reliability of the electrical power supplied to the water system. (3-30-07)

iv. A strategy for providing information to the public during power outages, including instructions to stop irrigation, boil water, etc., until notified otherwise. (3-30-07)

v. The level of reliability acceptable to consumers. This can be accomplished with either a vote of the majority of consumers for privately owned and operated systems or a decision by the governing body for publicly governed systems. (3-30-07)

vi. Other considerations that may be pertinent, including connections to other public water systems, agreements to provide water in emergency situations, and the availability of dedicated portable auxiliary power. (3-30-07)

08. On-Site Analysis and Testing Capabilities. Each public water system shall have equipment and facilities for routine testing necessary to ensure proper operation. Equipment selection shall be based on the characteristics of the raw water source and the complexity of the treatment process involved. (3-30-07)

09. Sample Taps. Sample taps shall be provided so that water samples can be obtained from each water source and from appropriate locations in each unit operation of treatment, and from the finished water. Taps shall be consistent with sampling needs and shall not be of the petcock type. Taps owned by the water system and used for obtaining samples for bacteriological analysis shall be of the smooth-nosed type without interior or exterior threads, shall not be of the mixing type, and shall not have a screen, aerator, or other such appurtenance. (3-30-07)

10. Facility Potable Water Supply. The facility water supply service line and the plant finished water sample tap shall be supplied from a source of finished water at a point where all chemicals have been thoroughly mixed, and the required disinfectant contact time, if applicable, has been achieved. There shall be no cross connections between the facility water supply service line and any piping, troughs, tanks, or other treatment units containing wastewater, treatment chemicals, raw or partially treated water. (3-30-07)

11. Meters. All water supplies shall have an acceptable means of measuring the flow from each source, the wash water, the recycled water, any blended water of different quality, and the finished water. (3-30-07)

12. Operation and Maintenance Manual. An operation and maintenance manual or manuals shall be provided for all public water systems. The manual shall include, but is not limited to, the following contents: 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. An operational trouble-shooting section shall be supplied to the water works as part of any proprietary unit installed in system facilities. (3-30-07)

13. Start-Up Training. Provisions shall be made for operator instruction at the start-up of a new plant or pumping station. (3-30-07)

14. Safety. Consideration shall be given to the protection of maintenance personnel and visitors from typical and foreseeable hazards in accordance with the engineering standards of care. The design shall comply with all applicable safety codes and regulations that may include the Uniform Building Code, Uniform Fire Code, National Fire Protection Association Standards, and state and federal OSHA standards. Items to be considered include, but are not limited to, noise arresters, noise protection, confined space entry, protective equipment and clothing, gas masks, safety showers and eye washes, handrails and guards, warning signs, smoke detectors, toxic gas detectors and fire extinguishers. (3-30-07)

15. Security. Appropriate design measures to help ensure the security of water system facilities shall be incorporated. Such measures, at a minimum, shall include means to lock all exterior doorways, windows, gates and other entrances to source, treatment, pumping stations, and water storage facilities. (3-30-07)

16. Other Regulations. Consideration must be given to the design requirements of other federal, state, and local regulatory agencies for items such as safety requirements, special designs for the handicapped, plumbing and electrical codes, and construction in the flood plain. (3-30-07)

17. Ground Water Source Redundancy. New community water systems served by ground water shall have a minimum of two (2) sources if they are intended to serve more than twenty-five (25) connections or equivalent dwelling units (EDUs). Under normal operating conditions, with any source out of service, the remaining source(s) shall be capable of providing either the peak hour demand of the system or a minimum of the maximum day demand plus equalization storage. See Subsection 501.18 for general design and redundancy requirements concerning fire flow capacity. (5-8-09)

18. Redundant Fire Flow Capacity. (3-30-07)

a. Public water systems that provide fire flow shall be designed to provide maximum day demand plus fire flow. Pumping systems supporting fire flow capacity must be designed so that fire flow may be provided with any pump out of service. (5-8-09)

b. The requirement for redundant pumping capacity specified in Subsection 501.18.a. may be reduced to the extent that fire suppression storage is provided in sufficient quantity to meet some or all of fire flow demands. Where fire suppression storage is not provided, the requirement for fire flow pumping redundancy may be reduced or eliminated if the following conditions are met: (5-8-09)

i. The local fire authority states in writing that the fire flow capacity of the system is acceptable and is compatible with the water demand of existing and planned fire fighting equipment and fire fighting practices in the area served by the system. (3-30-07)

ii. In a manner appropriate to the system type and situation, positive notification is provided to customers that describes the design of the system's fire fighting capability and explains how it differs from the requirements of Subsection 501.18.a. The notice shall indicate that the local fire authority has provided written acceptance of the system's fire flow capacity. (5-8-09)

502. FACILITY AND DESIGN STANDARDS: FACILITY PLANS.

See the definition of Facility Plan in Section 003. (3-30-07)

01. Facility Plans Required. All new public drinking water systems, and existing public drinking water systems undergoing material modification or expansion, are required to have a current facility plan that shall address all applicable issues specifically required in Sections 500 through 552 of these rules including, but not limited to, hydraulic capacity, treatment capacity, standby power, redundancy, fire flows, project financing, and operation and maintenance considerations sufficiently to determine the effects of the project on the overall infrastructure. Facility plans must address the entire potential service area of the project. Facility plans may not be required for simple water main extension projects as detailed in Subsections 502.01.a. and 502.01.b. (5-8-09)

a. Department-reviewed simple water main extension projects. A facility plan is not required if the Department is provided documentation supporting the ability of the purveyor to provide service for the simple water main extension without adding system components designed to control quantity or pressure to the system and while continuing to provide the pressure and quantity requirements of Subsection 552.01. Documentation may be in the form of: (5-8-09)

i. Hydraulic modeling; (5-8-09)

ii. Usage data and flow calculations; (5-8-09)

iii. Declining balance reports that demonstrate the system has the capacity to supply the service area of the system served by the extension; or (5-8-09)

iv. Other documentation acceptable to the Department. (5-8-09)

b. Qualified Licensed Professional Engineer (QLPE)-reviewed Simple Water Main Extension Projects. A Department-approved facility plan is not required to be in place prior to the QLPE approving a simple water main extension pursuant to Subsection 504.03.b., provided that the service area of the system served by the extension is in compliance with the facility and design standards in Sections 500 through 552 of these rules. If the Department has not approved a facility plan for the system which includes the proposed simple water main extension, then the system purveyor or the QLPE shall provide with the transmittal letter documentation supporting the ability of the purveyor to provide service for the simple water main extension without adding system components designed to control quantity or pressure to the system and while continuing to provide the pressure and quantity requirements of Subsection 552.01. The purveyor shall provide this documentation to the QLPE as necessary. Documentation may be in the form of: (5-8-09)

i. Hydraulic modeling; (5-8-09)

ii. Usage data and flow calculations; (5-8-09)

iii. Declining balance reports that demonstrate the system has the capacity to supply the service area of the system served by the extension; or (5-8-09)

iv. Other documentation acceptable to the Department. (5-8-09)

02. Submittal to the Department. When required, facility plans shall be submitted to the Department for review and approval prior to the submission of plans and specifications for a project related to the facility plan. (5-8-09)

03. Engineer's Seal Required. Facility plans submitted to the Department shall bear the imprint of an Idaho licensed professional engineer's seal that is both signed and dated by the engineer. (5-8-09)

04. Facility Plan Contents. The facility plan shall include basic information, criteria and assumptions, and alternative solutions with preliminary layouts and cost estimates as applicable. The facility plan is intended to address system wide growth, to identify system deficiencies, and to lay out a plan for system upgrades and expansion. (5-8-09)

a. New public water system facility plan. The minimum requirements for a facility plan for a new public water system are listed in Subsections 502.04.a.i. through 502.04.a.viii. If specific items listed in Subsections 502.04.a.i. through 502.04.a.viii. are not applicable to a particular system, then the submitting engineer shall state this in the facility plan and state the reason why the requirement is not applicable. The facility plan must also include sufficient detail to support applicable requirements of Sections 501 through 552. (5-8-09)

i. Location. A general description and location of the system. (5-8-09)

ii. Population. The estimated design population of the system including the number of connections and the number of EDUs proposed. (5-8-09)

iii. Sources of Water. Adequacy, quality, and availability of sources of water for potable use and a description of the non-potable irrigation system. (5-8-09)

iv. Treatment. Identify and describe any anticipated treatment. (5-8-09)

v. Water Quantity. Design data for domestic, irrigation, fire fighting, commercial, or industrial water uses, including peak hour, maximum day, and average day demands. (5-8-09)

vi. Storage. Include the size and location of any anticipated storage structures. (5-8-09)

vii. Operating Pressure. Pressure ranges for all flow conditions prescribed by these rules. (5-8-09)

viii. Sewage. Describe the sewage collection system and sewage treatment works, with reference to their relationship to existing or proposed water works structures which may affect the operation of the water supply

system, or which may affect the quality of the supply. (5-8-09)

b. Existing public water system facility plan. The minimum requirements for a facility plan for an existing public water system must include Subsections 502.04.b.i. through 502.04.b.vii. as well as Subsections 502.04.a.i. through 502.04.a.viii. If specific items listed in Subsections 502.04.b.i. through 502.04.b.vii. or Subsections 502.04.a.i. through 502.04.a.viii. are not applicable to a particular facility plan, then the submitting engineer shall state this in the facility plan and state the reason why the requirement is not applicable. The facility plan must also include sufficient detail to support applicable requirements of Sections 501 through 552. (5-8-09)

i. Hydraulic analysis. A computer analysis of the hydraulics of the distribution system if requested by the Department; any analysis of an existing distribution system shall be properly calibrated. The type or sophistication of analysis shall be dependent on the type of system. (5-8-09)

ii. Identify and evaluate problems related to the drinking water system. (5-8-09)

iii. Describe financing methods. (5-8-09)

iv. Set forth anticipated charges for users. (5-8-09)

v. Review organizational and staffing requirements. (5-8-09)

vi. Offer a project(s) recommendation for client consideration. (5-8-09)

vii. Outline official actions and procedures to implement the project. (5-8-09)

c. Public Water System Facility Plan funded by the State Revolving Fund. If the project is funded by the state revolving fund or a state grant, the facility plan must meet the requirements of Subsections 502.04.a. and 502.04.b., and other requirements that may also apply. See IDAPA 58.01.20, "Rules for Administration of Drinking Water Loan Program," and IDAPA 58.01.22, "Rules for Administration of Planning Grants for Public Drinking Water Facilities." (5-8-09)

d. Facility Plan Guidance. A checklist, which can be used as guidance, can be found on the DEQ website at http://www.deq.idaho.gov. The guidance document is for Department grant and loan projects, but may be used in part or in whole as a guide to assist in the development of any facility plan. (5-8-09)

503. FACILITY AND DESIGN STANDARDS: PRELIMINARY ENGINEERING REPORTS.
See the definition of Preliminary Engineering Report in Section 003. Preliminary engineering reports are required for all new water systems or material modifications to existing water systems that require plan and specification review and approval pursuant to Subsection 504.03. Preliminary engineering reports must be completed for all major water system projects including, but not limited to, source, pump station, pressure control, storage, and treatment projects. Preliminary engineering reports are not required for simple water main extensions that are approved in accordance with Subsections 502.01.a. or 502.01.b. (5-8-09)

01. Submittal to Reviewing Authority. Preliminary engineering reports shall be submitted to the Department for review and must be approved by the Department prior to the submission of plans and specifications. The Department may allow well construction plans and specifications to be submitted concurrently with a preliminary engineering report for these projects. (5-8-09)

02. Seal Required. Preliminary engineering reports submitted to the Department shall bear the imprint of an Idaho licensed professional engineer's seal that is both signed and dated by the engineer. The Department will accept the seal of an Idaho licensed professional geologist on preliminary reports for well source, spring source, or infiltration gallery site reports, and for well construction. (5-8-09)

03. Preliminary Engineering Report Contents. The preliminary engineering report must include sufficient detail to demonstrate the proposed project meets applicable criteria. The items included in Subsections 503.03.a. through 503.03.p., and all applicable issues and items specifically required in Sections 500 through 552, shall be addressed in detail. As applicable, a preliminary engineering report shall also identify and evaluate drinking

water related problems, assemble basic information, present criteria and assumptions, examine alternative solutions with preliminary layouts and cost estimates, offer a conclusion with a proposed project, and outline official actions and procedures to implement the project. If specific items in Subsections 503.03.a. through 503.03.p. are not applicable to a particular design, then the designer shall state this in the preliminary engineering report and state the reason why it is not applicable. Items adequately addressed in the facility plan under which the project is being designed may be addressed by reference for purposes of the preliminary engineering report. (5-8-09)

a. Existing System. A general description of the existing system. (5-8-09)

b. Location. A general description and location of the project. (5-8-09)

c. Size. The estimated system size based on number of persons, number of connections, or number of EDUs served or impacted by the project. (5-8-09)

d. Water Quantity. Design data for domestic, irrigation, fire fighting, commercial and industrial water uses, including peak hour, maximum day, and average day demands. (5-8-09)

e. Storage. Storage requirements. (3-30-07)

f. Operating Pressure. Pressure ranges for all flow conditions prescribed by these rules. (5-8-09)

g. Hydraulic Analysis. A computer analysis of the hydraulics of the distribution system if requested by the Department; any analysis of an existing distribution system shall be properly calibrated. The type and sophistication of analysis shall be dependent on the type of system. (5-8-09)

h. Sources of Water. Adequacy, quality and availability of sources of water. A water system that is to be served by a separate non-potable irrigation system must provide documentation to demonstrate the actual availability of water in sufficient quantity to ensure that the irrigation system will not compete with or in any way diminish the source of water for the potable water system. (5-8-09)

i. Sewage. Describe the sewage collection system and sewage treatment works, with special reference to their relationship to existing or proposed water works structures which may affect the operation of the water supply system, or which may affect the quality of the supply. (3-30-07)

j. Treatment Wastes. Characterize the various wastes from the water treatment processes and, if applicable, their volumes, constituents, and proposed treatment and disposal. If discharging to a sanitary sewage system, verify that the system is capable of handling the flow to the treatment works and that the treatment works is capable and willing to accept the additional loading. (3-30-07)

k. Monitoring Results. Unless unobtainable, as in the case of a ground water source for a new public water system, monitoring results shall be included for any project that adds capacity, treatment, or has the potential to affect the water quality of the existing system. (5-8-09)

i. Community Systems. Results of analysis for total coliform, inorganic chemical contaminants, organic chemicals, and radionuclide contaminants set forth in Subsections 050.01, 050.02, 050.05, 100.01, 100.03, 100.04, 100.05, and 100.06, unless analysis is waived pursuant to Subsection 100.07. (5-8-09)

ii. Nontransient noncommunity systems. Results of analysis for total coliform and inorganic and organic chemical contaminants listed in Subsections 050.01, 050.02, 100.01, 100.03, 100.04, unless analysis is waived pursuant to Subsection 100.07. (5-8-09)

iii. Transient noncommunity systems. Results of a total coliform, nitrite, and nitrate analysis listed in Subsections 050.01, 100.01 and 100.03. (5-8-09)

iv. Turbidity. For any system supplied by surface water or ground water under the direct influence of surface water, results of turbidity analysis listed in Subsection 100.02. (3-30-07)

l. Potential Contamination. Identify sources of contamination near proposed sources of water and describe how the sources will be protected. (3-30-07)

m. Flooding. Mechanisms for protection of the system from flooding. (3-30-07)

n. Additional Information - Surface Water. In addition to the items listed in Subsections 503.03.a. through 503.03.m., the following information must be provided for proposed surface water sources and ground water sources under the direct influence of surface water: (5-8-09)

i. Hydrological and historical stream flow data. (3-30-07)

ii. A copy of the appropriate permit(s) or application(s) from the Idaho Department of Water Resources regarding authorization to appropriate public waters of the state of Idaho in sufficient quantity to meet the design requirements of the system. (5-8-09)

iii. Anticipated turbidity ranges, high and low. (3-30-07)

iv. Treatment selection process and alternative evaluations. (3-30-07)

v. Assessment of the degree of control the water system will be able to exercise over the watershed. (3-30-07)

vi. Projected future uses of impoundments or reservoirs within the watershed. (3-30-07)

vii. Assess degree of hazard to the supply by agricultural, industrial, recreational, and residential activities in the watershed, and by accidental spillage of materials that may be toxic, harmful or detrimental to treatment processes. (3-30-07)

viii. Assess all waste discharges and activities that could impact the water supply. The location of each waste discharge shall be shown on a scale map. (3-30-07)

ix. Obtain source water samples over a sufficient period of time to assess the microbiological, physical, chemical and radiological characteristics of the water. (3-30-07)

x. Consideration of currents, wind and ice conditions, and the effect of confluent streams. (3-30-07)

o. Additional Information - Ground Water. In addition to the items listed in Subsections 503.03.a. through 503.03.m., the following information must be provided for a proposed ground water source: (5-8-09)

i. A site evaluation report as required in Section 510 for wells and Section 514 for springs. (3-30-07)

ii. Dimensions of the well lot and location of source. Include geographical coordinates of the source location. (3-30-07)

iii. Underground geological data and existing well logs. (3-30-07)

iv. If the water is to be treated, summarize the adequacy of proposed processes and unit parameters for the treatment of the specific water. Bench scale testing, pilot studies, or demonstrations of treatment adequacy may be required. (3-30-07)

v. A copy of the appropriate permit(s) or application(s) from the Idaho Department of Water Resources regarding authorization to appropriate public waters of the state of Idaho in sufficient quantity to meet the design requirements of the system. (5-8-09)

vi. Evaluation of surface water influence. For all new ground water sources, including but not limited to wells, springs, and infiltration galleries, systems shall supply information as required by the Department to determine if these sources are under the direct influence of surface water. This requirement shall also apply to any

existing ground water source that is found to be at risk of surface water influence during a field survey conducted by the Department. (5-8-09)

p. Soils and ground water levels. Generally discuss soil, ground water conditions, and potential building foundation problems, including a description of: (3-30-07)

i. The character of the soil through which water mains are to be laid. (3-30-07)

ii. Characteristics of the soil, water table, and geological substrate that may affect the design and construction of the foundations of proposed structures. (3-30-07)

iii. The approximate elevation of ground water in relation to subsurface structures. (3-30-07)

504. FACILITY AND DESIGN STANDARDS: REVIEW OF PLANS AND SPECIFICATIONS.
The facility and design standards set forth in these rules shall be applied in the review of plans and specifications for public water system facilities. If design issues are not addressed by the facility and design standards set out in these rules, then guidance documents, some of which are listed in Subsection 002.02, shall be used as guidance in the design and review of plans and specifications for public drinking water facilities. See also Section 013. (3-30-07)

01. Ownership. Documentation of the ownership and responsibility for operating the proposed system shall be made available to the Department prior to or concurrent with the submittal of plans and specifications as required in Subsection 504.03. The documentation must show organization and financial arrangements adequate to assure construction, operation and maintenance of the system according to these rules. Documentation shall also include the name of the water system, the name, address, and phone number of the supplier of water, the system size, and the name, address, and phone number of the system operator. (3-30-07)

02. Connection to an Existing System. If the proposed project is to be connected to an existing public water system, a letter from the purveyor must be submitted to the Department stating that the purveyor will be able to provide services to the proposed project. The Department may require documentation supporting the ability of the purveyor to provide service to the new system without diminishing quality of service to existing customers. This letter must be submitted prior to or concurrent with the submittal of plans and specifications as required in Subsection 504.03. (3-30-07)

03. Plans and Specifications Required. (3-30-07)

a. Prior to construction of new public drinking water systems, new drinking water systems designed to serve fifteen (15) or more service connections, or material modifications of existing public water systems, plans and specifications must be submitted to the Department for review and approval. Construction should commence as soon as practical after approval, and if construction is not completed within twelve (12) months of the Department's final approval, an extension or re-approval must be obtained from the Department. The Department may require re-submittal of all or part of the plans and specifications prior to issuing an extension or re-approving the plans and specifications. (4-7-11)

b. Plans and specifications for simple water main extensions shall not require pre-construction approval by the Department when such extensions will be owned and operated by a city, county, quasi-municipal corporation or regulated public utility, provided that such plans and specifications are reviewed and approved by a QLPE who was not involved in the preparation of the plans and specifications being reviewed to verify compliance with the requirements of these rules prior to initiation of construction. Any plans and specifications approved pursuant to Subsection 504.03.b. shall be transmitted to the Department at the time construction is authorized and shall be marked or stamped as "Approved for Construction." Along with the plans and specifications, the transmittal must include the items listed in Subsections 504.03.b.i. through 504.03.b.vii. The plans and specifications must be sealed, signed, and dated by the professional engineer in responsible charge of their preparation, and the approval or transmittal letter must be sealed, signed, and dated by the QLPE that is approving the plans and specifications. (5-8-09)

i. A statement that the author of the transmittal letter is the QLPE representing the city, county, quasi-municipal corporation or regulated public entity. (5-8-09)

ii. A statement that the extension project complies with the current facility plan or preliminary engineering report, or a statement that the water system has adequate capacity. Please see Subsection 502.01.b. for further information. (5-8-09)

iii. A statement from the city, county, quasi-municipal corporation or regulated public entity or its authorized agent that the water system purveyor will serve the project. (5-8-09)

iv. A statement from the city, county, quasi-municipal corporation or regulated public entity or its authorized agent that the water system purveyor will own and operate the project after construction is complete. (5-8-09)

v. A statement by the QLPE that the plans and specifications are approved for construction. (5-8-09)

vi. A statement by the QLPE that the plans and specifications comply with the facility standards within these rules. (5-8-09)

vii. A statement recommending whether sanitary restrictions can be released or should remain in force. (5-8-09)

c. Subsections 504.03.c.i. through 504.03.c.vi. outline the projects which QLPEs may approve and which QLPEs may not approve. (5-8-09)

i. A QLPE may approve plans and specifications for simple water main extensions that are able to connect to an existing water system owned by a city, county, quasi-municipal corporation, or regulated public utility at the time the extension is approved for construction by the QLPE. (5-8-09)

ii. A QLPE may approve plans for simple water main extensions which will connect to an existing water system, but are unable to connect to the system at the time the extension is approved for construction by the QLPE, provided sanitary restrictions remain in force for the proposed extension. (5-8-09)

iii. A QLPE may not approve plans and specifications which include mechanical systems such as booster stations. (5-8-09)

iv. A QLPE may not approve plans and specifications for projects which the QLPE was the design engineer or otherwise involved in the design. (5-8-09)

v. A QLPE employed by a city, county, quasi-municipal corporation, or regulated public utility may approve a design that was prepared by a subordinate engineer or an engineer from a separate design group within the city, county, quasi-municipal corporation, or regulated public utility. (5-8-09)

vi. A QLPE who is not employed by a city, county, quasi-municipal corporation, or regulated public utility, but is retained by a city, county, quasi-municipal corporation, or regulated public utility for the purpose of plan and specification review may not approve projects designed by the company with which the QLPE is employed. (5-8-09)

d. At the discretion of the city, county, quasi-municipal corporation or regulated public utility, the plans addressed by Subsection 504.03.b. may be referred to the Department for review and approval prior to initiation of construction. (3-30-07)

e. New or updated operation and maintenance manual or manuals, as required in Subsection 501.12, shall be submitted to the Department for review and approval prior to start-up of the new or modified public water system. (3-30-07)

04. Criteria for Review. The Department shall review plans and specifications to determine compliance with these rules and engineering standards of care. If the plans and specifications comply with these rules and engineering standards of care, the Department shall not substitute its judgment for that of the owner's design

engineer concerning the manner of compliance with the rule. (3-30-07)

05. Schedule for Review. The Department shall review plans and specifications and endeavor to resolve design issues within forty-two (42) calendar days of submittal such that approval can be granted. If the Department and applicant have not resolved design issues within forty-two (42) calendar days or at any time thereafter, the applicant may file a written demand to the Department for a decision. Upon receipt of such written demand, the Department shall deliver a written decision to the applicant within no more than seven (7) calendar days explaining any reasons for disapproval. The Department shall maintain records of all written demands for decision made pursuant to Subsection 504.05 with such records including the final decision rendered and the timeliness thereof. (3-30-07)

06. Engineer's Seal Required. Plans and specifications submitted to the Department shall bear the imprint of an Idaho licensed professional engineer's seal; except that the Department will accept the seal of an Idaho licensed professional geologist on the following: (3-30-07)

a. Well source, spring source, or infiltration gallery site evaluation reports, as specified in Subsections 510 and 514. (3-30-07)

b. Plans and specifications for well construction and results of field inspection and testing, as specified in Section 510. (3-30-07)

07. Contents of Plans and Specifications. Plans and specifications shall, where pertinent, provide the following: (3-30-07)

a. General layout, including: (3-30-07)

i. Suitable title. (3-30-07)

ii. Name of municipality or other entity or person responsible for the water supply. (3-30-07)

iii. Area or institution to be served. (3-30-07)

iv. Scale of drawings. (3-30-07)

v. North arrow. (3-30-07)

vi. Datum used. (3-30-07)

vii. General boundaries of municipality or area to be served. (3-30-07)

viii. Date, name, and address of the designing engineer. (3-30-07)

ix. Legible prints suitable for reproduction. (3-30-07)

x. Location and size of existing water mains, if applicable. (3-30-07)

xi. For systems undergoing material modification, location and nature of existing water works structures and appurtenances affecting the proposed improvements. (3-30-07)

b. Detailed plans, including: (3-30-07)

i. Stream crossings, providing profiles with elevations of the stream bed and the estimated normal and extreme high and, where appropriate, low water levels. (3-30-07)

ii. Location and size of the property to be used for the development with respect to known references such as roads, streams, section lines, or streets. (3-30-07)

iii. Topography and arrangement of present or planned wells or structures. (3-30-07)

iv. Elevations of the one hundred (100) year flood level in relation to the floor of structures, upper termination of protective casings, and grade surrounding facilities. (3-30-07)

v. Details of well construction, including diameter and depth of drill holes, casing and liner diameters and depths, grouting depths, elevations, and designation of geological formations, water levels and other data as specified in Section 510. (3-30-07)

vi. Location of all known existing and potential sources of pollution within five hundred (500) feet of water sources or underground treated storage facilities. (3-30-07)

vii. Size, length, and materials of proposed water mains. (3-30-07)

viii. Location of existing or proposed streets; water sources, ponds, lakes, and drains; storm sanitary, combined and house sewers; septic tanks, disposal fields and cesspools. (3-30-07)

ix. Schematic flow diagrams and hydraulic profiles showing the flow through various plant units. (3-30-07)

x. Piping in sufficient detail to show flow through the plant including waste lines. (3-30-07)

xi. Locations of all chemical storage areas, chemical feeding equipment, and points of chemical application. (3-30-07)

xii. All appurtenances, specific structures, equipment, water treatment plant waste disposal units and points of discharge having any relationship to the plans for water mains or water works structures. (3-30-07)

xiii. Locations of sanitary or other facilities, such as lavatories, showers, toilets, and lockers, when applicable or required by the Department. (3-30-07)

xiv. Locations, dimensions, and elevations of all proposed plant facilities. (3-30-07)

xv. Locations of all sampling taps owned by the water system. (3-30-07)

xvi. Adequate description of any significant features not otherwise covered by the specifications that may impact public safety or welfare. (3-30-07)

c. Complete, detailed technical specifications shall be supplied for the proposed project, including: (3-30-07)

i. A program for keeping existing water works facilities in operation during construction of additional facilities so as to minimize interruption of service. (3-30-07)

ii. Laboratory facilities and equipment. (3-30-07)

iii. Description of chemical feeding equipment. (3-30-07)

iv. Procedures for flushing, disinfection and testing, as needed, prior to placing the project in service. All wells, pipes, tanks, and equipment which can convey or store potable water shall be disinfected in accordance with AWWA Standards, incorporated into these rules at Subsection 002.01. Plans or specifications shall outline the procedure and include the disinfectant dosage, contact time, and method of testing the results of this procedure. (3-30-07)

v. Materials or proprietary equipment for sanitary or other facilities, including any necessary backflow or back-siphonage protection. (3-30-07)

d. Complete design criteria, as set forth in these rules. (3-30-07)

e. The Department may require additional information which is not part of the construction drawings, including, but not limited to, head loss calculations, proprietary technical data, and copies of contracts. (3-30-07)

08. Notification of Material Deviations. As set forth in Subsection 504.03, during construction or modification, the reviewing authority must be notified of any material deviation from the approved plans. The reviewing authority's prior written approval is required before any material deviation is allowed. (3-30-07)

09. Record Plans and Specifications Required. (5-8-09)

a. Within thirty (30) calendar days of the completion of construction of facilities for which plans are required to be reviewed pursuant to Subsection 504.03, record plans and specifications based on information provided by the construction contractor and field observations made by the engineer or the engineer's designee depicting the actual construction of facilities performed, must be submitted to the Department by the engineer representing the city, county, quasi-municipal corporation or regulated public utility that owns the project, or by the design engineer or owner-designated substitute engineer if the facilities will not be owned and operated by a city, county, quasi-municipal corporation or regulated public utility. Such submittal by the professional engineer must confirm material compliance with the approved plans and specifications or disclose any material deviations therefrom. If the construction does not materially deviate from the approved plans and specifications, the owner may have a statement to that effect prepared by an Idaho licensed professional engineer and filed with the Department in lieu of submitting a complete and accurate set of record drawings. (3-30-07)

b. Record plans and specifications, or a statement submitted in lieu of record plans and specifications, must be sealed, signed, and dated by the professional engineer in responsible charge of their preparation. (5-8-09)

c. The Department will accept the seal of an Idaho licensed professional geologist on record plans and specifications, or a statement bearing the seal of an Idaho licensed professional geologist in lieu of record plans and specifications, for record plans and specifications for well construction and results of field inspection and testing, as specified in Section 510. (5-8-09)

10. Exception. The Department may waive the plan and specification approval required of any particular facility or category of facilities when doing so will have no significant impact on public health or the environment. (3-30-07)

11. Requirement to Have Approved Plans and Specifications and Approval Letter On-Site During Construction. It is the responsibility of the owner to maintain one (1) copy of the approved plans and specifications and the approval letter from the reviewing authority on-site during construction at all times. (3-30-07)

12. Construction. Except as provided in Subsection 504.03.b., no construction shall commence until all of the necessary approvals have been received from the Department. The owner shall provide for the inspection of the construction of a public drinking water system facility by an Idaho licensed professional engineer to the extent required to confirm material compliance with the approved plans and to produce accurate record documents as required by Subsection 504.09. (3-30-07)

505. -- 509. (RESERVED).

510. FACILITY AND DESIGN STANDARDS: SITING AND CONSTRUCTION OF WELLS.
Written approval by the Department is required before water from any new or reconstructed well may be served to the public. Any supplier of water for a public water system served by one (1) or more wells shall ensure that the following requirements are met: (3-30-07)

01. Site Approval. Prior to drilling, the site of a public water system well must be approved in writing by the Department. The Department shall require the supplier of water to submit a well site evaluation report that takes into account the proposed size, depth, and location of the well. The evaluation may include, but is not limited to the following types of information: (3-30-07)

a. An evaluation of the potability and quality of anticipated ground water. (5-3-03)

b. Identification of the known aquifers and the extent of each aquifer, based on the stratigraphy, sedimentation, and geologic structure beneath the proposed well site. (5-3-03)

c. An estimate of hydrologic and geologic properties of each aquifer and confining layers. (5-3-03)

d. Prediction of the sources of water to be extracted by the well and the drawdown of existing wells, springs, and surface water bodies that may be caused by pumping the proposed well. This prediction may be based on analytical or numerical models as determined by the Idaho Department of Water Resources permitting process. (3-30-07)

e. Demonstration of the extent of the capture zone of the well, based on the well's design discharge and on aquifer geology, using estimates of hydraulic conductivity and storativity. (5-3-03)

f. Description of potential sources of contamination within five hundred (500) feet of the well site. (5-3-03)

02. Location. Each well shall be staked by the design engineer or licensed professional geologist prior to drilling, be located a minimum of fifty (50) feet from the nearest property line, be located a minimum of fifty (50) feet from any potential source of contamination, and be no closer to specified sources of contamination than set forth in Subsection 900.01. In vulnerable settings, the Department may require engineering or hydrologic analysis to determine if the required setback distance is adequate to prevent contamination. (5-8-09)

03. Construction Standards. In addition to meeting the requirements of these rules, all wells shall be constructed in accordance with IDAPA 37.03.09, "Well Construction Standards Rules," and related rules and laws administered by the Idaho Department of Water Resources. All wells shall comply with the drilling permit requirements of Section 42-235, Idaho Code. (5-3-03)

a. Casing that meets the requirements set forth in Subsection 900.02 (Table 2). The use of plastic well casing for public water system wells may be considered on a case-by-case basis. Plastic casing shall meet or exceed ASTM Standard F480-02 and ANSI/NSF Standard 61. (5-8-09)

b. Public water system wells shall have no less than fifty-eight (58) feet of annular seal of not less than one and one-half (1 ½) inches thickness as measured from land surface to the bottom of the seal unless: (3-30-07)

i. It can be demonstrated to the Department's satisfaction that there is a confining layer at lesser depth that is capable of preventing unwanted water from reaching the intake zone of the well; or (5-3-03)

ii. The best and most practical aquifer at a particular site is less than fifty-eight (58) feet deep; or; (5-3-03)

iii. The Department specifies a different annular seal depth based on local hydrologic conditions. (5-3-03)

iv. More stringent standards are required by applicable Rules of the Idaho Water Resources Board, referenced in Subsection 002.02. (3-30-07)

c. Specifications shall include allowable tolerances for plumbness and alignment in accordance with AWWA Standards, incorporated by reference into these rules at Subsection 002.01, or as otherwise approved by the Department. If the well fails to meet these requirements, it may be accepted by the Department if it does not interfere with the installation or operation of the pump or uniform placement of grout. (3-30-07)

d. Geological data shall be collected at each pronounced change in formation and shall be recorded in the driller's log. Supplemental data includes, but is not limited to, accurate geographical location such as latitude and longitude or GIS coordinates, and other information on accurate records of drillhole diameters and depths, assembled

order of size and length of casing, screens and liners, grouting depths, formations penetrated, and water levels. (3-30-07)

e. The owner of each well shall retain all records pertaining to each well until the well has been properly abandoned. (3-30-07)

f. Wells with intake screens shall: (3-30-07)

i. Be constructed of materials resistant to damage by chemical action of ground water or cleaning operations. (3-30-07)

ii. Have openings based on sieve analysis of formation or gravel pack materials. (5-8-09)

iii. Have sufficient length and diameter to provide adequate specific capacity and aperture entrance velocity not to exceed point three (0.3) feet per second, or as otherwise approved by the Department. (3-30-07)

iv. Be installed so that the pumping water level remains above the screen under all operating conditions, or otherwise approved by the Department. Where a bottom plate or sump is utilized, it shall be of the same material as the screen, or as otherwise approved by the Department. Where a washdown assembly, tailpipe or sump is used below the screen, it may be made of a different material than the screen. (3-30-07)

g. Permanent well casing shall be surrounded by a minimum of one and one-half (1 ½) inches of grout to the depth required by Subsection 510.03.b. of these rules, or by the Rules of the Idaho Water Resources Board referenced in Subsection 002.02, whichever is greater. All casing identified in plans and specifications as temporary casing shall be removed prior to well completion. (5-8-09)

i. Neat cement grout consisting of cement that conforms to AWWA Standard A-100, and water, with not more than six (6) gallons of water per ninety-four (94) pounds of cement, shall be used for one and one-half (1 ½) inch openings. Additives may be used to enhance effectiveness and are subject to approval by the reviewing authority and the Idaho Department of Water Resources on a case-by-case basis. (3-30-07)

ii. Bentonite grout shall have a solids content not less than twenty-five (25) percent by weight when mixed with water and be specifically manufactured for use in sealing of well casing. Bentonite grout shall not contain weighting agents to increase solids content. Bentonite grout shall not be used above the water table. All bentonite grout shall be installed by positive displacement from the bottom up through a tremmie or float shoe. (3-30-07)

iii. Where a dry annular space is to be sealed, a minimum of two (2) inches on all sides of the casing shall be required to place bentonite to depths not greater than one hundred (100) feet, using #8 mesh granular bentonite. All dry pour granular bentonite shall be tagged at appropriate intervals to verify placement. If a bridge occurs, a tremmie pipe shall be washed or jetted through the bridge to allow for pumping of grout. Bentonite chips shall be of sufficient size to accommodate proper placement for the existing subsurface conditions. (3-30-07)

iv. Dry granular bentonite used in wells where a dry annular space is to be sealed with depths greater than one hundred (100) feet shall require an annulus of at least three (3) inches on all sides of the casing, or as approved by the reviewing authority and the Idaho Department of Water Resources. If a bridge occurs, a tremmie pipe shall be washed or jetted through the bridge to allow for pumping of grout. Bentonite chips shall be of sufficient size to accommodate proper placement for the existing subsurface conditions. (3-30-07)

v. All chip bentonite seals installed through water shall only be used in annular spaces of at least four (4) inches on all sides of the casing. If a bridge occurs, a tremmie pipe shall be washed or jetted through the bridge to allow for pumping of grout. Bentonite chips shall be of sufficient size to accommodate proper placement for the existing subsurface conditions. Chip bentonite seals installed through water shall be: (3-30-07)

(1) Installed in accordance with manufacturer's specifications; or (3-30-07)

(2) Installed by pouring chips over a one-quarter (1/4) inch mesh screen for three-eighths (3/8) inch chips to remove fines to prevent bridging at the water table; or (3-30-07)

(3) Installed using coated pellets to retard hydration if approved by the reviewing authority and the Idaho Department of Water Resources. (3-30-07)

vi. Concrete may be approved on a case-by-case basis by the reviewing authority and the Idaho Department of Water Resources. Upon such approval, the approved method shall use a six (6) sack minus one-half (1/2) inch Portland cement concrete and shall be installed by positive displacement from the bottom up through a tremmie pipe. (3-30-07)

04. Disinfection. All tools, bits, pipe, and other materials to be inserted in the borehole shall be cleaned and disinfected in accordance with the Well Construction Standards and permitting requirements of the Idaho Water Resources Board, referenced in Subsection 002.02 This applies to new well construction and repair of existing wells. (3-30-07)

05. Well Completion Report Required. Upon completion of a well, and prior to its use as a drinking water source, the following information and data must be submitted by the water system to the Department. The well completion report must be submitted to the Department prior to or concurrent with the submittal of the preliminary engineering report for well house construction/modification. The well completion report shall bear the imprint of an Idaho licensed professional engineer's or an Idaho licensed professional geologist's seal that is both signed and dated by the engineer or geologist: (4-7-11)

a. A copy of all well logs; (12-10-92)

b. Results of test pumping, as specified in Subsection 510.06; (4-7-11)

c. As constructed plans showing at least the following: (12-10-92)

i. Annular seal, including depth and sealant material used and method of application; (5-3-03)

ii. Casing perforations, results of sieve analysis used in designing screens installed in sand or gravel aquifers, gravel packs; and (5-3-03)

iii. Recommended pump location; and (4-7-11)

iv. For community water systems, a permanent means for measuring water level. All equipment required for conducting water level measurements shall be purchased and made available to the water system operator at the time well construction is completed. Where pneumatic or electronic water level measuring equipment is used, it shall be made using corrosion resistant materials attached firmly to the drop pipe or pump column and in such a manner as to prevent entrance of foreign materials. (3-30-07)

d. Other information as may be specified by the Department. (12-10-92)

e. Sampling results for iron, manganese, corrosivity, and other secondary contaminants specified by the Department. Other monitoring requirements are specified in Subsections 510.05.e.i. through 510.05.e.iii. (5-8-09)

i. Community Systems. Results of analysis for total coliform, inorganic chemical contaminants, organic chemicals, and radionuclide contaminants set forth in Subsections 050.01, 050.02, 050.05, 100.01, 100.03, 100.04, 100.05, and 100.06, unless analysis is waived pursuant to Subsection 100.07. (5-8-09)

ii. Nontransient Noncommunity Systems. Results of analysis for total coliform and inorganic and organic chemical contaminants listed in Subsections 050.01, 050.02, 100.01, 100.03, 100.04, unless analysis is waived pursuant to Subsection 100.07. (5-8-09)

iii. Transient Noncommunity Systems. Results of a total coliform, nitrite, and nitrate analysis listed in Subsections 050.01, 100.01 and 100.03. (5-8-09)

06. Test Pumping. Upon completion of a ground water source, test pumping shall be conducted in

accordance with the following procedures to meet the specified requirements: (12-10-92)

a. The well shall be test pumped at the desired yield (design capacity) of the well for at least twenty-four (24) consecutive hours after the drawdown trend has stabilized, as determined by the supervising engineer or geologist. Alternatively, the well may be pumped at a rate of one hundred fifty percent (150%) of the desired yield for at least six (6) continuous hours after the drawdown trend has stabilized, as determined by the supervising engineer or geologist. The field pumping equipment must be capable of maintaining a constant rate of discharge during the test. Discharge water must be piped an adequate distance to prevent recharge of the well during the test. If the well fails the test protocol, design of the water system shall be re-evaluated and submitted to the Department for approval. (3-30-07)

b. Upon completion of well development, the well shall be tested for sand production. Fifteen (15) minutes after the start of the test pumping (at or above the design production rate), the sand content of a new well shall not be more than five (5) parts per million. Sand production shall be measured by a centrifugal sand sampler or other means acceptable to the Department. If sand production exceeds five (5) ppm, the well shall be screened gravel packed, or re-developed. (3-30-07)

c. The following data shall be provided: (5-3-03)

i. Static water level in the well prior to test pumping; (5-3-03)

ii. Well yield in gpm and duration of the pump test, including a discussion of any discrepancy between the desired yield and the yield observed during the test; (5-3-03)

iii. Water level in the well recorded at regular intervals during pumping; (5-3-03)

iv. Profile of water level recovery from the pumping level projected to the original static water level. (5-3-03)

v. Depth at which the test pump was positioned in the well; (5-3-03)

vi. Test pump capacity and head characteristics; (5-3-03)

vii. Sand production data. (5-3-03)

viii. Results of analysis based on the drawdown and recovery test pertaining to aquifer properties, long term sustained yield, and boundary conditions affecting drawdown. (4-7-11)

d. The Department may allow the use of other pump test protocols that are generally accepted by engineering firms with specialized experience in well construction, by the well drilling industry, or as described in national standards (such as ANSI/AWWA A100-97), as long as the minimum data specified in Subsection 510.06.c. are provided. The Department welcomes more extensive data about the well, such as step-drawdown evaluations used in determining well capacity for test pumping purposes, zone of influence calculations, and any other information that may be of use in source protection activities or in routine water system operations. (3-30-07)

e. Where aquifer yield, sustainability, or water quality are questionable, the Department, at its discretion, may require additional site specific investigations that could include test well construction, long-term pumping tests, or other means to demonstrate that the aquifer is sufficient to meet the long-term water requirements of the project. (4-11-06)

07. Conversion of Non-Public Water System Wells for Public Water System Use. Any existing well constructed for use other than as a public water system source may be considered for use as a public water system source on a case-by-case basis. The owner of such a well must demonstrate to the Department's satisfaction that the well site conforms to the requirements of Subsections 510.01, 510.02, and Section 512, the well is constructed in a manner that is protective of public health and that both the quantity and quality of water produced by the well meet public water system standards set forth in these rules. (5-8-09)

08. Observation Wells. If observation wells are used and are intended to remain in service after completion of the water supply well, the observation wells shall be constructed in accordance with the requirements for permanent wells and be protected at the upper terminal to preclude entrance of foreign materials. See Rules of the Idaho Water Resources Board referenced in Subsection 002.02. (3-30-07)

09. Well Abandonment. Any water supply well that will no longer be used must be abandoned by sealing the borehole carefully to prevent pollution of the ground water, eliminate any physical hazard, conserve aquifer yield, maintain confined head conditions in artesian wells, and prevent mixing of waters from different aquifers. The objective of proper well abandonment procedures is to restore, as far as possible, the original hydrogeologic conditions. The services of a licensed well driller are required. Instructions for abandoning various types of wells may be obtained from the Idaho Department of Water Resources. See Rules of the Idaho Water Resources Board referenced in Subsection 002.02. (3-30-07)

511. FACILITY AND DESIGN STANDARDS: WELL PUMPS, DISCHARGE PIPING, AND APPURTENANCES.

01. Sample Tap Required. A sample tap suitable for collecting bacteriological samples shall be provided on the discharge piping from every well at a point where pressure is maintained but prior to any treatment. This sample tap shall be of the smooth-nosed type without interior or exterior threads, shall not be of the mixing or petcock type, and shall not have a screen, aerator, or other such appurtenance. The sample tap for collecting bacteriological samples may be used for other sampling purposes. In addition, threaded hose bib taps may also be used for collecting samples, other than bacteriological samples, if equipped with an appropriate backflow prevention device as may be necessary to protect the public water system from contamination. (5-8-09)

02. Discharge Piping. The discharge line shall be equipped with the necessary valves and appurtenances to allow a well to 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, and shall meet the following requirements: (3-30-07)

a. Be designed to minimize friction loss. (3-30-07)

b. Have control valves and appurtenances located above the pump house floor when an above-ground discharge is provided. (3-30-07)

c. Be protected against contamination. (3-30-07)

d. Vertical turbine pumps shall be equipped with an air release-vacuum relief valve, or equivalent, located upstream from the check valve, with exhaust/relief piping terminating in a down-turned position at least eighteen (18) inches above the floor and covered with a twenty-four (24) mesh corrosion resistant screen. (3-30-07)

e. Have all exposed piping, valves and appurtenances protected against physical damage and freezing. (3-30-07)

f. Be properly anchored to prevent movement, and protected against surge or water hammer. (3-30-07)

03. Pressure Gauge Required. A pressure gauge shall be provided on all discharge piping. (4-7-11)

04. Flow Meter and Check Valve. Unless otherwise approved by the Department, an instantaneous and totalizing flow meter equipped with nonvolatile memory shall be installed on the discharge line of each well in accordance with the manufacturer's specifications. An accessible check valve, which is not located in the pump column, shall be installed in the discharge line of each well between the pump and the shut-off valve. Additional check valves shall be located in the pump column as necessary. (4-7-11)

05. Well Vent. All wells shall be vented, unless it can be demonstrated that the drawdown under maximum pumping conditions will not exceed ten (10) feet. The open end of the vent shall be screened with a twenty-four (24) mesh or similar non-corrodible screen and terminated downward at least eighteen (18) inches above the final ground surface. Artesian wells equipped with pumps may need venting or an air valve as determined by the

Department. (4-7-11)

06. Casings and Sanitary Well Caps. The following requirements apply to well casings and sanitary caps: (3-30-07)

a. Casings shall extend a minimum of eighteen (18) inches above the final ground surface. If the well is located within a pump house, casings shall extend twelve (12) inches above the pump house floor. For a well located in an area subject to flooding, the Department may require an extension of the casing above the one hundred (100) year or highest known flood level, whichever is higher. (4-7-11)

b. Wells shall be cased and provided with an approved cap in such a manner that surface water cannot enter the well. (4-7-11)

07. Well Houses. For regulatory purposes, a well house is considered a pump house as defined in Section 003. Well houses must meet the requirements for pump houses as set forth in Section 541. All above ground discharge piping shall be contained in a well house or otherwise protected from freezing. (4-7-11)

08. Pitless Adapters and Units. Pitless adapters or pitless units: (3-30-07)

a. Shall be of the type marked approved by the National Sanitation Foundation or Pitless Adapter Division of the Water Systems Council. (12-10-92)

b. Shall be designed, constructed and installed to be watertight including the cap, cover, casing extension and other attachments. (12-10-92)

c. Shall be field tested for leaks before being put into service. The procedure outlined in "Manual of Individual and Non-Public Water Supply Systems," referenced in Subsection 002.02, or other procedure approved by the Department shall be followed. (3-30-07)

d. Pitless adapters with a two (2) inch or smaller discharge line shall be provided with a swing joint outside the pitless adapter unit to reduce strain, deformation, and possible leakage of the pitless seal caused by settling soils in the trench. The orientation of swing joints shall be such that any settling that occurs will tighten the threads. The hole in the casing shall be cut with a saw rather than a torch with an opening large enough to allow seating of gaskets. (3-30-07)

e. Shall be provided with a contamination-proof entrance connection for electrical cable. (3-30-07)

f. In the case of pitless adapters: (3-30-07)

i. Threaded adapters shall be installed by drilling a hole not more than one quarter (1/4) inch larger than the outer diameter of the pitless shank. No torch-cut holes shall be accepted. The orientation of swing joints shall be such that any settling that occurs will tighten the threads. (3-30-07)

ii. The only field welding permitted will be that needed to connect a pitless adapter to the casing. (3-30-07)

g. In the case of pitless units: (3-30-07)

i. Shall be shop-fabricated from the point of connection with the well casing to the unit cap or cover. (3-30-07)

ii. Shall be constructed of materials and weight at least equivalent to and compatible with the well casing. (3-30-07)

iii. Shall be threaded or welded to the well casing. Threaded units shall be installed by drilling a hole not more than one quarter (¼) inch larger than the outer diameter of the pitless shank. No torch-cut holes shall be accepted. If the connection to the casing is by field weld, the shop-assembled unit must be designed specifically for

field welding to the casing. (3-30-07)

iv. Shall terminate at least eighteen (18) inches above final ground elevation or three (3) feet above the 100-year flood level or the highest known flood elevation, whichever is higher, or as otherwise approved by the Department. (3-30-07)

v. Shall be provided with access to disinfect the well. (3-30-07)

vi. Shall have field connection to the lateral discharge from the pitless unit of threaded, flanged, or mechanical joint connection. (3-30-07)

h. After installation of a pitless adapter or unit and depending on ground water levels and other subsurface conditions, any disturbed well seal may require repair or replacement to meet original seal specifications as determined by the Department. (4-7-11)

09. Wells Not Allowed in Pits. Wells shall not be located in pits. Exceptions to this requirement will be granted by the Department if the well was constructed prior to November 5, 1964, and the installation is constructed or reconstructed in accordance with the requirements of the Department to provide watertight construction of pit walls and floors, floor drains and acceptable pit covers. (3-30-07)

10. Discharge Pumps. Discharge pumps shall be subject to the following requirements: (3-30-07)

a. Line shaft pumps shall. (3-30-07)

i. Have the casing firmly connected to the pump structure or have the casing inserted into a recess extending at least one-half (1/2) inch into the pump base. (3-30-07)

ii. Have the pump foundation and base designed to prevent water from coming into contact with the joint. (3-30-07)

iii. Use lubricants that meet ANSI/NSF Standard 61. (3-30-07)

b. When a submersible pump is used: (3-30-07)

i. The top of the casing shall be effectively sealed against the entrance of water under all conditions of vibration or movement of conductors or cables. (3-30-07)

ii. The electrical cable shall be firmly attached to the drop pipe at twenty-one (21) foot intervals or less, or at each coupling or joint. (3-30-07)

512. FACILITY AND DESIGN STANDARDS: WELL LOT.

A well lot shall be provided for wells constructed after November 1, 1977. The well lot shall be owned in fee simple by the supplier of water or controlled by lease or easement with a term of not less than the useful life of the well and be large enough to provide a minimum distance of fifty (50) feet between the well and the nearest property line. (3-30-07)

01. Use of Chemicals on the Well Lot. No pesticides, herbicides, or fertilizers shall be applied to a well lot without prior approval from the Department. (3-30-07)

02. Storage of Hazardous Materials on the Well Lot. No pesticides, herbicides, fertilizers, portable containers of petroleum products, or other materials known to be toxic or hazardous shall be stored on a well lot, except that: (3-30-07)

a. An internal combustion engine to drive either a generator for emergency standby power or a pump to provide fire flows, and an associated fuel tank, may be placed on the well lot. (5-3-03)

b. A propane or natural gas powered generator is preferable to reduce risk of fuel spillage. (5-3-03)

c. If a diesel or gasoline-fueled engine is used, the fuel tank and connecting piping must be approved by the Underwriter's Laboratory, Inc., double-walled, meet the requirements of the local fire jurisdiction, and include both spill prevention and overfill protection features. The tank must be above ground and may be contained within the structural base of the generator unit. A licensed water system operator shall be present during filling of the tank following a period of usage, or during periodic extraction and replacement of outdated fuel. (4-6-05)

d. Should the internal combustion engine be located within the pump house, the floor of the pump house shall be constructed so as to contain all petroleum drips and spills so that they will not be able to reach the floor drain(s). Engine exhaust shall be directly discharged outside the pump house. (3-30-07)

e. A spill containment structure shall surround all fuel tanks and be sized to contain at least one hundred ten percent (110%) of the fuel tank volume. The Department may require additional containment capacity in settings where accumulation of snow, ice, or rain water could be expected to diminish the usable capacity of the structure. (4-6-05)

03. Location of Hydrants. Hydrants of the frost free type shall be placed in the buried piping system at a minimum of five (5) feet away from the well casing to prevent drain water from accumulating and compromising the grout seal surrounding the well casing. (5-8-09)

04. Parking Lots and Vehicle Storage. No public parking or vehicle storage shall be allowed on the well lot, except that operation/maintenance vehicles may be temporary parked on the well lot during the normal course of business. (4-7-11)

513. FACILITY AND DESIGN STANDARDS: NUMBER OF GROUND WATER SOURCES REQUIRED – EXISTING SYSTEMS.

Existing community water systems served by ground water and intending to serve more than twenty-five (25) connections or equivalent dwelling units are subject to the following requirements for the number of ground water sources required. (5-8-09)

01. Existing System with All Sources Constructed Prior to July 1, 1985. A community water system served by ground water and with all existing sources constructed prior to July 1, 1985 will be required to comply with Subsection 501.17 upon substantially modifying the system after July 2002. (5-8-09)

02. Existing System with Any Sources Constructed After July 1, 1985. A community water system served by ground water with any sources constructed after July 1, 1985 is required to comply with Subsection 501.17 when a modification is made to the system which increases the population served or number of service connections, increases the length of transmission and distribution water mains, or increases the peak or average water demand. (5-8-09)

514. FACILITY AND DESIGN STANDARDS: SPRING SOURCES.

Written approval by the Department is required before water from any new or reconstructed spring source may be served to the public. For new spring sources, the Department shall require a site evaluation report containing applicable required information listed in Subsection 510.01. This information includes, but is not limited to, the following: an evaluation of the potability and quality of anticipated spring water; an estimate of hydrologic and geologic properties of the aquifer; and a description of potential sources of contamination within five hundred (500) feet of the spring. Any supplier of water for a public water system served by one (1) or more springs shall ensure that the following requirements are met: (4-7-11)

01. Protection of the Spring. Springs shall be housed in a permanent structure and protected from contamination including the entry of surface water, animals, and dust. The spring box shall be equipped with a screened overflow. The inlet shall be screened as determined by the Department and located above the floor of the collection chamber. (4-7-11)

02. Access to Spring Box. Each spring box access shall be elevated at least twenty-four (24) inches above the top of the box or the ground level, whichever is higher. The actual height above the top of the box or the ground level must be sufficient to prevent incidental contamination from snow accumulation, storm water runoff or

accumulation, irrigation water, or other potential sources of contamination. Each access shall be fitted with a solid water tight cover which overlaps a framed opening and extends down around the frame at least two (2) inches. The frame shall be at least four (4) inches high and shall have a locking device. (5-8-09)

03. Sample Tap Required. A sample tap suitable for collecting bacteriological samples shall be provided. This sample tap shall be of the smooth-nosed type without interior or exterior threads, shall not be of the mixing or petcock type, and shall not have a screen, aerator, or other such appurtenance. The sample tap for collecting bacteriological samples may be used for other sampling purposes. In addition, threaded hose bib taps may also be used for collecting samples, other than bacteriological samples, if equipped with an appropriate backflow prevention device as may be necessary to protect the public water system from contamination. (5-8-09)

04. Flow Measurement. A flow meter or other flow measuring device shall be provided. (3-30-07)

05. Protected Area. The entire area within a one hundred (100) foot radius of the spring box shall be owned by the supplier of water or controlled by a long term lease, fenced to prevent trespass of livestock and void of buildings, dwellings and sources of contamination. Surface water shall be diverted from this area. (3-30-07)

515. FACILITY AND DESIGN STANDARDS: SURFACE SOURCES AND GROUND WATER SOURCES UNDER THE DIRECT INFLUENCE OF SURFACE WATER.

Written approval by the Department is required before water from any new surface source or ground water source that is under the direct influence of surface water may be served to the public. Infiltration collection lines or galleries are considered ground water under the direct influence of surface water unless demonstrated otherwise. Infiltration galleries that are not directly influenced by surface water shall meet the requirements of Section 514. The area around infiltration lines shall be under the control of the water purveyor for a distance acceptable to the Department. (3-30-07)

01. Intake Structures. Design of intake structures shall provide for: (3-30-07)

a. Withdrawal of water from more than one (1) level if quality varies with depth. (3-30-07)

b. Separate facilities for release of less desirable water held in storage. (3-30-07)

c. Where frazil ice may be a problem, holding the velocity of flow into the intake structure to a minimum, generally not to exceed point five (0.5) feet per second. Frazil ice is made up of randomly distributed ice crystals that are formed in flowing water that has cooled below thirty-two (32) degrees Fahrenheit and is prevented from forming into ice sheets by the movement of the water. (3-30-07)

d. Inspection manholes every one thousand (1000) feet for pipe sizes large enough to permit visual inspection. (3-30-07)

e. Cleaning the intake line as needed. (3-30-07)

f. Adequate protection against rupture by dragging anchors, ice, or other hazards. (3-30-07)

g. Ports located above the bottom of the stream, lake or impoundment, but at sufficient depth to be kept submerged at low water levels. (3-30-07)

h. Where shore wells are not provided, a diversion device capable of keeping large quantities of fish or debris from entering an intake structure. (3-30-07)

i. If necessary, provisions shall be made in the intake structure to control the influx of nuisance aquatic organisms. Specific control methods must be approved by the reviewing authority. (3-30-07)

j. When buried surface water collectors are used, sufficient intake opening area must be provided to minimize inlet headloss. Particular attention shall be given to the selection of backfill material in relation to the collector pipe slot size and gradation of the native material over the collector system. (3-30-07)

02. Raw Water Pumps. Raw water pumping wells shall: (3-30-07)

a. Have motors and electrical controls located above grade (except for submersible pumps), and protected from flooding as required by the reviewing authority. (3-30-07)

b. Be accessible and designed to prevent flotation. (3-30-07)

c. Be equipped with removable or traveling screens before the pump suction well. (3-30-07)

d. Provide for introduction of chlorine or other chemicals in the raw water transmission main if necessary for quality control. (3-30-07)

e. Where practical, have intake valves and provisions for back flushing or cleaning by a mechanical device and testing for leaks. (3-30-07)

f. Have provisions for withstanding surges where necessary. (3-30-07)

03. Offstream Raw Water Storage. An off-stream raw water storage reservoir is a facility into which water is pumped during periods of good quality and high stream flow for future release to treatment facilities. These off-stream raw water storage reservoirs shall be constructed to assure that: (3-30-07)

a. Water quality is protected by controlling runoff into the reservoir. (3-30-07)

b. Dikes are structurally sound and protected against wave action and erosion. (3-30-07)

c. Intake structures and devices meet requirements of Subsection 515.01. (3-30-07)

d. Point of influent flow is separated from the point of withdrawal. (3-30-07)

e. Separate pipes are provided for influent to and effluent from the reservoir. (3-30-07)

04. Reservoirs. Impoundments and reservoirs shall provide, where applicable: (3-30-07)

a. Removal of brush and trees to high water elevation. (3-30-07)

b. Protection from floods during construction. (3-30-07)

c. Abandonment of all wells which will be inundated, in accordance with requirements of the Idaho Department of Water Resources. See Rules of the Idaho Water Resources Board referenced in Subsection 002.02. (3-30-07)

516. -- 517. (RESERVED).

518. FACILITY AND DESIGN STANDARDS: ADDITIONAL DESIGN CRITERIA FOR SURFACE WATER TREATMENT.

Performance criteria for surface water treatment facilities are specified in National Primary Drinking Water Regulations, as set forth in Sections 300, 301, and 310 of these rules. Surface water treatment systems must comply with applicable general design requirements in Section 503. In addition, the following design requirements apply specifically to surface water treatment facilities: (3-30-07)

01. Engineering Design Requirements. The system shall ensure that filtration and disinfection facilities for surface water or ground water directly influenced by surface water sources are designed, constructed and operated in accordance with all applicable engineering practices designated by the Department. The design of the water treatment plant must consider the worst raw water quality conditions that are likely to occur during the life of the facility. (3-30-07)

02. Removal of Pathogens. Filtration facilities (excluding disinfection) shall be designed, constructed

and operated to achieve at least two (2) log removal of Giardia lamblia cysts, two (2) log removal of Cryptosporidium oocysts, and one (1) log removal of viruses, except as allowed under Subsection 518.09.b. (3-30-07)

03. Disinfection. Disinfection facilities shall be designed, constructed and operated so as to achieve at least point five zero (0.50) log inactivation of Giardia lamblia cysts; and (3-30-07)

a. Two (2) log inactivation of viruses if using conventional and slow sand filtration technology; or (12-10-92)

b. Three (3) log inactivation of viruses if using direct and diatomaceous earth filtration technology; or (12-10-92)

c. Four (4) log inactivation of viruses if using alternate filtration technology. (12-10-92)

d. Four (4) log inactivation of viruses if filtration treatment is not used. (10-1-93)

04. Enhanced Disinfection. Higher levels of disinfection than specified under Subsection 518.03 may be required by the Department in order to provide adequate protection against giardia and viruses. (5-8-09)

05. Filter to Waste. For plants constructed after December 31, 1992, each filter unit must be capable of filter to waste. For plants constructed prior to December 31, 1992, each filter unit must be capable of filter to waste unless the system demonstrates through continuous turbidity monitoring or other means acceptable to the Department that water quality is not adversely affected following filter backwashing, cleaning or media replacement. (3-30-07)

06. Continuous Turbidity Monitoring. For conventional, direct, membrane, and diatomaceous earth filtration technology, equipment must be provided to continuously measure the turbidity of each filter unit. (3-30-07)

07. Continuous Monitoring of Disinfectant. Equipment must be provided and operated for continuous measurement of disinfectant residual prior to entry to the distribution system, unless the system serves fewer than three thousand three hundred (3,300) people. (3-30-07)

08. Continuous Operation Required. Diatomaceous earth filtration facilities shall include an alternate power source with automatic startup and alarm, or be designed in a manner to ensure continuous operation. (3-30-07)

09. Acceptable Technology. The purveyor shall select a filtration technology acceptable to the Department. (3-30-07)

a. Conventional, direct, membrane, slow sand and diatomaceous earth filtration technologies are generally acceptable to the Department on a case-by-case basis. (5-3-03)

b. Alternate filtration technologies may be acceptable if the purveyor demonstrates all of the following to the satisfaction of the Department: (12-10-92)

i. That the filtration technology: (12-10-92)

(1) Is certified and listed by the National Sanitation Foundation (NSF) under Standard 53, Drinking Water Treatment Units - Health Effects, as achieving the NSF criteria for cyst reduction; or (12-10-92)

(2) Removes at least ninety-nine percent (99%) (two (2) logs) of Cryptosporidium oocysts or surrogate particles and removes or inactivates at least ninety-nine percent (99%) (two (2) logs) of Giardia lamblia cysts or Giardia lamblia cyst surrogate particles in a challenge study acceptable to the Department. (3-30-07)

ii. Based on field studies or other means acceptable to the Department, it must be demonstrated that the filtration technology has the following capabilities: (3-30-07)

(1) In combination with disinfection treatment, consistently achieves at least ninety-nine percent (99%)

(two (2) logs) removal of Cryptosporidium oocysts or surrogate particles and at least ninety-nine and nine tenths percent (99.9%) (three (3) logs) removal or inactivation of Giardia lamblia cysts and ninety-nine and ninety-nine hundredths percent (99.99%) (four (4) logs) removal or inactivation of viruses; and (3-30-07)

(2) Meets the turbidity performance requirements of 40 CFR 141.73 (b). (12-10-92)

10. Pilot Studies. The system shall conduct pilot studies in accordance with the following requirements for all proposed filtration facilities and structural modifications to existing filtration facilities, unless the Department modifies the requirements in writing: (12-10-92)

a. The system shall obtain the Department's approval of the pilot study plan before the pilot filter is constructed and before the pilot study is undertaken. (12-10-92)

b. The design and operation of the pilot study shall be overseen by an Idaho licensed professional engineer. (3-30-07)

c. The system's pilot study plan shall identify at a minimum: (12-10-92)

i. The objectives of the pilot study; (12-10-92)

ii. Pilot filter design; (12-10-92)

iii. Water quality and operational parameters to monitor; (12-10-92)

iv. Amount of data to collect; and (12-10-92)

v. Qualifications of the pilot plant operator. (10-1-93)

d. The system shall ensure that the pilot study is: (12-10-92)

i. Conducted to simulate conditions of the proposed full-scale design; (12-10-92)

ii. Conducted for at least twelve (12) consecutive months or for a shorter period upon approval by the Department; (5-3-03)

iii. Conducted to evaluate the reliability of the treatment system to achieve applicable water quality treatment criteria specified for filtration systems in 40 CFR 141.72 and 40 CFR 141.73; and (12-10-92)

iv. Designed and operated in accordance with good engineering practices documented in references acceptable to the Department. (12-10-92)

11. Redundant Disinfection. Surface water systems constructed after July 1, 1985, are required to install redundant disinfection components or maintain a backup unit on site as required to maintain constant application of disinfectant whenever water is being delivered to the distribution system. (3-30-07)

519. FACILITY AND DESIGN STANDARDS: SURFACE WATER TREATMENT; DESIGN STANDARDS FOR MICROSCREENING.

A microscreen may be used to reduce nuisance organisms and organic loadings. It shall not be used in place of filtration or coagulation in the preparation of water for filtration. (3-30-07)

01. Design Considerations. The following shall be taken into account during design: (3-30-07)

a. The nature of the suspended matter to be removed. (3-30-07)

b. The corrosiveness of the water. (3-30-07)

c. The effect of chlorination, when required as pre-treatment. (3-30-07)

d. The duplication of units for continuous operation during equipment maintenance. (3-30-07)

e. Automated backflushing operation when used in conjunction with microfiltration treatment. (3-30-07)

02. Design Requirements. Design shall provide the following: (3-30-07)

a. A durable, corrosion-resistant screen. (3-30-07)

b. A by-pass arrangement. (3-30-07)

c. Protection against back-siphonage when potable water is used for washing. (3-30-07)

d. Proper disposal of water used to wash the microscreen. (3-30-07)

520. FACILITY AND DESIGN STANDARDS: SURFACE WATER TREATMENT: CLARIFICATION PROCESSES.
Treatment facilities designed to include clarification for processing surface water shall meet the following requirements: (3-30-07)

01. Two Units Required. A minimum of two (2) units shall be provided for flocculation and sedimentation. (3-30-07)

02. Parallel or Serial Operation. The units shall be capable of being operated either in series or parallel where softening is performed. (3-30-07)

03. Independent Units. The units shall be constructed in such a way that each can be taken out of service without disrupting operation, and with drains or pumps sized to allow dewatering in a reasonable period of time. (3-30-07)

04. Manual Start-Up. The units shall be started manually following shutdown. (3-30-07)

05. Pre-Treatment. Waters exhibiting high turbidity may require pretreatment, usually sedimentation with or without the addition of coagulation chemicals. When presedimentation is provided, the following requirements must be met: (3-30-07)

a. Incoming water shall be dispersed across the full width of the line of travel as quickly as possible. Short circuiting must be prevented. (3-30-07)

b. Provisions for bypassing pre-sedimentation basins shall be included. (3-30-07)

06. Rapid Mix. Rapid mix shall mean the rapid dispersion of chemicals throughout the water to be treated, usually by violent agitation. The engineer shall submit the design basis for the velocity gradient (G value) selected, considering the chemicals to be added and water temperature, color and other related water quality parameters. Basins or mixing chambers shall be equipped with devices capable of providing adequate mixing for all treatment flow rates. (3-30-07)

07. Flocculation. Flocculation shall mean the gathering together of fine particles in water by gentle mixing after the addition of coagulant chemicals to form larger particles. (3-30-07)

a. Basin inlet and outlet design shall minimize short-circuiting and destruction of floc. A drain, pumps, or a combination of both drain and pumps shall be provided to accomplish dewatering and sludge removal. (5-8-09)

b. The flow-through velocity shall not be less than one-half (0.5) nor greater than one and one-half (1.5) feet per minute with a detention time for floc formation of at least thirty (30) minutes unless otherwise approved

by the Department. (3-30-07)

c. Agitators shall be driven by variable speed drives. (3-30-07)

d. Flocculation and sedimentation basins shall be as close together as possible. The velocity of flocculated water through pipes or conduits to settling basins shall be not less than one-half (0.5) nor greater than one and one-half (1.5) feet per second. Allowances must be made to minimize turbulence at bends and changes in direction. (3-30-07)

08. Small Systems May Use Baffling. Baffling may be used to provide for flocculation in small plants upon approval by the Department. (3-30-07)

09. Sedimentation Units. The following criteria apply to conventional sedimentation units: (3-30-07)

a. A minimum of two (2) hours of settling time shall be provided following flocculation unless adequate settling in less time can be demonstrated. (3-30-07)

b. Inlets shall be designed to distribute the water equally and at uniform velocities. (3-30-07)

c. Outlet weirs or submerged orifices shall maintain velocities suitable for settling in the basin and minimize short-circuiting. Outlet weirs shall be designed so that the rate of flow over the outlet weirs or through the submerged orifices shall not exceed twenty-thousand (20,000) gallons per day per foot of the outlet launder. The entrance velocity through the submerged orifices shall not exceed one-half (0.5) feet per second. (3-30-07)

d. The velocity through settling basins shall not exceed one-half (0.5) feet per minute. The basins must be designed to minimize short-circuiting. Fixed or adjustable baffles must be provided as necessary to achieve the maximum potential for clarification. (3-30-07)

e. When an overflow weir or pipe is provided the overflow shall discharge by gravity with a free fall at a location where the discharge will be noted. (3-30-07)

f. Adequate sludge collection equipment that ensures proper basin coverage shall be provided and basins must be provided with a means for dewatering. (3-30-07)

g. Flushing lines or hydrants shall be provided and must be equipped with backflow prevention devices acceptable to the Department. (3-30-07)

h. Sludge removal design shall provide that sludge pipes are not less than three (3) inches in diameter and arranged so as to facilitate cleaning. Entrance to sludge withdrawal piping shall be designed to prevent clogging. Provision shall be made for the operator to observe and sample sludge being withdrawn from the unit. (3-30-07)

i. Sludge shall be disposed of in accordance with applicable regulations, as set forth in Section 540. (3-30-07)

10. Solids Contact Clarifiers. Solids contact clarifiers are generally acceptable for combined softening and clarification where water characteristics, especially temperature, do not fluctuate rapidly, flow rates are uniform and operation is continuous. A minimum of two (2) units are required for surface water treatment. (3-30-07)

a. Chemicals shall be applied at such points and by such means as to ensure satisfactory mixing of the chemicals with the water. (3-30-07)

b. Unless otherwise approved by the Department, a rapid mix device or chamber ahead of the solids contact clarifier is required to assure proper mixing of the chemicals applied. Mixing devices employed shall be constructed so as to provide good mixing of the raw water with previously formed sludge particles and prevent deposition of solids in the mixing zone. (3-30-07)

c. Flocculation equipment shall be adjustable as to speed, pitch, or a combination of speed and pitch

and must provide for coagulation in a separate chamber or baffled zone within the unit. (5-8-09)

d. Sludge removal design shall provide that sludge pipes are not less than three (3) inches in diameter and arranged so as to facilitate cleaning. Entrance to sludge withdrawal piping shall be designed to prevent clogging. Provision shall be made for the operator to observe and sample sludge being withdrawn from the unit. (3-30-07)

e. Blow-off outlets and drains must terminate and discharge at places acceptable to the Department in regard to control of potential cross connections. Cross connection control must be included for the potable water lines used to backflush sludge lines. (3-30-07)

f. The detention time shall be established on the basis of the raw water characteristics and other local conditions that affect the operation of the unit. The Department may request data to support decisions made with respect to detention times. The Department may alter detention time requirements. (3-30-07)

g. Controls for sludge withdrawal which minimize water losses shall be provided. (3-30-07)

h. Unless otherwise approved by the Department, weirs shall be adjustable and at least equivalent in length to the perimeter of the tank. Weir loading shall not exceed ten (10) gallons per minute per foot of weir length for units used as clarifiers or twenty (20) gallons per minute per foot of weir length for units used for softening. Where orifices are used, the loading rates per foot of launder rates shall be equivalent to weir loadings. Either shall produce uniform rising rates over the entire area of the tank. (3-30-07)

i. Upflow rates shall not exceed one (1) gallon per minute per square foot of area at the sludge separation line for units used as clarifiers or one and three-quarters (1.75) gallons per minute per foot of area at the slurry separation line for units used as softeners. The Department may consider higher rates if supporting data is provided. (3-30-07)

11. Settler Units. Settler units consisting of variously shaped tubes or plates installed in multiple layers and at an angle to the flow may be used for sedimentation following flocculation. (3-30-07)

a. Inlets and outlets shall be designed to maintain velocities suitable for settling in the basin and to minimize short-circuiting. Plate units shall be designed to minimize unequal distribution across the units. (3-30-07)

b. Drain piping from the settler units must be sized to facilitate a quick flush of the settler units and to prevent flooding other portions of the plant. (3-30-07)

c. Although most units will be located within a plant, outdoor installations must provide sufficient freeboard above the top of settlers to prevent freezing in the units. (3-30-07)

d. Water shall be applied to tube settlers at a maximum rate of two (2) gallons per minute per square foot of cross-sectional area for tube settlers, unless higher rates are justified through pilot plant or in-plant demonstration studies. (3-30-07)

e. Water shall be applied to plate settlers at a maximum plate loading rate of one-half (0.5) gallons per minute per square foot, based on eighty (80) percent of the projected horizontal plate area. (3-30-07)

f. Flushing lines shall be provided to facilitate maintenance and must be properly protected against backflow or back siphonage. (3-30-07)

12. High Rate Clarification. High rate clarification processes may be approved upon demonstrating satisfactory performance under on-site pilot plant conditions or documentation of full scale plant operation with similar raw water quality conditions. Reductions in detention times and/or increases in weir loading rates shall be justified. Examples of such processes include dissolved air flotation, ballasted flocculation, contact flocculation/ clarification, and helical upflow. (3-30-07)

521. FACILITY AND DESIGN STANDARDS: SURFACE WATER TREATMENT: FILTRATION USING RAPID RATE GRAVITY FILTERS.

01. Pretreatment. The use of rapid rate gravity filters shall require pretreatment in the form of coagulation, flocculation, and sedimentation. (3-30-07)

02. Rate of Filtration. The filter rate must be proposed and justified by the design engineer to the satisfaction of the Department prior to the preparation of final plans and specifications. (3-30-07)

03. Number of Units. At least two (2) units shall be provided. Where only two (2) units are provided, each shall be capable of meeting the plant design capacity (normally the projected maximum daily demand) at the approved filtration rate. Where more than two (2) filter units are provided, the filters shall be capable of meeting the plant design capacity at the approved filtration rate with one (1) filter removed from service. Where declining rate filtration is provided, the variable aspect of filtration rates, and the number of filters must be considered when determining the design capacity for the filters. (3-30-07)

04. Structure and Hydraulics. The filter structure shall be designed to provide for: (3-30-07)

a. Vertical walls within the filter. There shall be no protrusion of the filter walls into the filter media. (3-30-07)

b. Cover by superstructure with sufficient headroom to permit normal inspection and operation. (3-30-07)

c. Minimum depth of filter box of eight and one-half (8.5) feet. (3-30-07)

d. Minimum water depth over the surface of the filter media of three (3) feet. (3-30-07)

e. Trapped effluent to prevent backflow of air to the bottom of the filters. (3-30-07)

f. Prevention of floor drainage to the filter with a minimum four (4) inch curb around the filters. (3-30-07)

g. Prevention of flooding by providing overflow. (3-30-07)

h. Maximum velocity of treated water entering the filters of two (2) feet per second. (3-30-07)

i. Cleanouts and straight alignment for influent pipes or conduits where solids loading is heavy, or following lime-soda softening. (3-30-07)

j. Washwater drain capacity to carry maximum flow. (3-30-07)

k. Walkways around filters to be not less than twenty-four (24) inches wide and equipped with safety handrails or walls. (3-30-07)

l. Construction so as to prevent cross connections and common walls between potable and non-potable water. (3-30-07)

05. Washwater Troughs. Washwater troughs shall be constructed to have: (3-30-07)

a. The bottom elevation above the maximum level of expanded media during washing. (3-30-07)

b. A two (2) inch freeboard at the maximum rate of wash. (3-30-07)

c. The top edge level and all at the same elevation. (3-30-07)

d. Spacing so that each trough serves the same number of square feet of filter area. (3-30-07)

e. Maximum horizontal travel of suspended particles to reach the trough not to exceed three (3) feet.

(3-30-07)

06. Filter Material. The media shall be clean silica sand or other natural or synthetic media free from detrimental chemical or bacterial contaminants, approved by the Department, and having the following characteristics: (3-30-07)

a. A total depth of not less than twenty-four (24) inches and generally not more than thirty (30) inches. (3-30-07)

b. An effective size range of the smallest material no greater than forty-five hundredths (0.45) of a millimeter to fifty-five hundredths (0.55) of a millimeter. (3-30-07)

c. A uniformity coefficient of the smallest material not greater than one and sixty-five hundredths (1.65). (3-30-07)

d. A minimum of twelve (12) inches of media with an effective size range no greater than forty-five hundredths (0.45) of a millimeter to fifty-five hundredths (0.55) of a millimeter and a specific gravity greater than other filtering materials within the filter. (3-30-07)

e. Types of filter media are as follows: (3-30-07)

i. Clean, crushed anthracite or a combination of anthracite and other media may be considered on the basis of experimental data specific to the project. The anthracite shall have the following characteristics: (3-30-07)

(1) Effective size of forty-five hundredths (0.45) of a millimeter to fifty-five hundredths (0.55) of a millimeter with uniformity coefficient not greater than sixty-five hundredths (1.65) when used alone. (3-30-07)

(2) Effective size of eight tenths (0.8) of a millimeter to one and two-tenths (1.2) millimeters with a uniformity coefficient not greater than one and eighty-five hundredths (1.85) when used as a cap. (3-30-07)

(3) Effective size for anthracite used as a single media on potable ground water for iron and manganese removal only shall be a maximum of eight tenths (0.8) of a millimeter (effective sizes greater than this may be approved based upon onsite pilot plant studies or other demonstration acceptable to the Department). (3-30-07)

ii. Sand media shall have the following characteristics: (3-30-07)

(1) Effective size of forty-five hundredths (0.45) of a millimeter to fifty-five hundredths (0.55) of a millimeter. (3-30-07)

(2) Uniformity coefficient of not greater than one and sixty-five hundredths (1.65). (3-30-07)

(3) Larger size sand media may be allowed by the Department where full-scale tests have demonstrated that treatment goals can be met under all conditions. (3-30-07)

iii. Granular activated carbon (GAC) as a single media may be considered for filtration only after pilot or full-scale testing and with prior approval of the Department. The design shall include the following: (3-30-07)

(1) The media must meet the basic specifications for filter media as given in Subsections 518.06.a. through d., except that larger size media may be allowed where full scale tests have demonstrated that treatment goals can be met under all conditions. (3-30-07)

(2) There must be provisions for a free chlorine residual and adequate contact time in the water following the filters and prior to distribution. (3-30-07)

(3) There must be a means for periodic treatment of filter material for control of bacterial and other growth. (3-30-07)

(4) Provisions must be made for frequent replacement or regeneration. (3-30-07)

iv. Other media will be considered based on experimental data and operating experience. (3-30-07)

v. A three (3) inch layer of torpedo sand shall be used as a supporting media for filter sand where supporting gravel is used, and shall have an effective size of eight-tenths (0.8) millimeters to two (2.0) millimeters, and a uniformity coefficient not greater than one and seven-tenths (1.7). (3-30-07)

vi. Gravel, when used as the supporting media, shall consist of cleaned and washed, hard, durable, rounded silica particles and shall not include flat or elongated particles. The coarsest gravel shall be two and one-half (2.5) inches in size when the gravel rests directly on a lateral system and must extend above the top of the perforated laterals. Not less than four (4) layers of gravel shall be provided in accordance with the size and depth distribution specified in the table below. Reduction of gravel depths and other size gradations may be considered upon justification to the reviewing authority for slow sand filtration or when proprietary filter bottoms are specified.

Size of Gravel	Depth
2 ½ to 1 ½ inches	5 to 8 inches
1 ½ to ¾ inches	3 to 5 inches
¾ to ½ inches	3 to 5 inches
½ to 3/16 inches	2 to 3 inches
3/16 to 3/32 inches	2 to 3 inches

(3-30-07)

07. Filter Bottoms and Strainer Systems. Departure from the standards set out in Subsection 521.07 may be acceptable for high rate filters and for proprietary bottoms. Porous plate bottoms shall not be used where iron or manganese may clog them or with waters softened by lime. The design of manifold-type collection systems shall: (3-30-07)

a. Minimize loss of head in the manifold and laterals. (3-30-07)

b. Ensure even distribution of wash water and even rate of filtration over the entire area of the filter. (3-30-07)

c. Provide the ratio of the area of the final openings of the strainer systems to the area of the filter at about three-thousandths (0.003), (3-30-07)

d. Provide the total cross-sectional area of the laterals at about twice the total area of the final openings. (3-30-07)

e. Provide the cross-sectional area of the manifold at one and one-half (1.5) to two (2) times the total area of the laterals. (3-30-07)

f. Lateral perforations without strainers shall be directed downward. (3-30-07)

08. Surface or Subsurface Wash. Surface or subsurface wash facilities are required except for filters used exclusively for iron or manganese removal, and may be accomplished by a system of fixed nozzles or a revolving-type apparatus. All devices shall be designed with: (3-30-07)

a. Provision for water pressures of at least forty-five (45) pounds per square inch. (3-30-07)

b. A properly installed vacuum breaker or other approved device to prevent back siphonage if connected to the treated water system. (3-30-07)

c. Rate of flow of two (2.0) gallons per minute per square foot of filter area with fixed nozzles or one-half (0.5) gallon per minute per square foot with revolving arms. (3-30-07)

d. Air wash can be considered based on experimental data and operating experiences. (3-30-07)

09. Air Scouring. Air scouring can be considered in place of surface wash provided the following conditions are met: (3-30-07)

a. Air flow for air scouring the filter must be three (3) to five (5) standard cubic feet per minute square foot of filter area when the air is introduced in the underdrain; a lower air rate must be used when the air scour distribution system is placed above the underdrains. (3-30-07)

b. A method for avoiding excessive loss of the filter media during backwashing must be provided. (3-30-07)

c. Air scouring must be followed by a fluidization wash sufficient to restratify the media. (3-30-07)

d. Air must be free from contamination. (3-30-07)

e. Air scour distribution systems shall be placed below the media and supporting bed interface with the following exception: if placed at the interface the air scour nozzles shall be designed to prevent media from clogging the nozzles or entering the air distribution system. (3-30-07)

f. Piping for the air distribution system shall not be flexible hose which will collapse when not under air pressure and shall not be a relatively soft material which may erode at the orifice opening with the passage of air at high velocity. (3-30-07)

g. Air delivery piping shall not pass down through the filter media nor shall there be any arrangement in the filter design which would allow short circuiting between the applied unfiltered water and the filtered water. (3-30-07)

h. The backwash water delivery system must be capable of fifteen (15) gallons per minute per square foot of filter surface area (37 m/hr); however, when air scour is provided the backwash water rate must be variable and should not exceed eight (8) gallons per minute per square foot (20 m/hr) unless operating experience shows that a higher rate is necessary to remove scoured particles from filter media surfaces. (3-30-07)

i. The filter underdrains shall be designed to accommodate air scour piping when the piping is installed in the underdrain. (3-30-07)

10. Filter Appurtenances. The following shall be provided for every filter: (3-30-07)

a. Influent and effluent sampling taps. (3-30-07)

b. A gauge capable of indicating loss of head. (3-30-07)

c. A meter indicating rate-of flow. A modified rate controller which limits the rate of filtration to a maximum rate may be used. However, equipment that simply maintains a constant water level on the filters is not acceptable, unless the rate of flow onto the filter is properly controlled. A pump or a flow meter in each filter effluent line may be used as the limiting device for the rate of filtration only if approved by the Department on a site-specific basis. (3-30-07)

11. Backwash. Provisions shall be made for washing filters as follows: (3-30-07)

a. A minimum backwash rate such that a fifty (50) percent expansion of the filter bed is achieved. (3-30-07)

b. Filtered water provided at the required rate by wash water tanks, a wash water pump, from the high service main, or a combination of these. (3-30-07)

c. Wash water pumps in duplicate unless an alternate means of obtaining wash water is available. (3-30-07)

d. Not less than fifteen (15) minutes wash of one filter at the design rate of wash. (3-30-07)

e. A wash water regulator or valve on the main wash water line to obtain the desired rate of filter wash with the wash water valves on the individual filters open wide. (3-30-07)

f. A rate-of-flow indicator, preferably with a totalizer, on the main wash water line, located so that it can be easily read by the operator during the washing process. (3-30-07)

g. Design to prevent rapid changes in backwash water flow. Backwash shall be operator initiated. Automated systems shall be operator adjustable. (3-30-07)

12. Roof Drainage. Roof drains shall not discharge into the filters or basins and conduits preceding the filters. (3-30-07)

522. FACILITY AND DESIGN STANDARDS: SURFACE WATER TREATMENT: FILTRATION USING DIATOMACEOUS EARTH.

The use of these filters may be considered for application to surface waters with low turbidity and low bacterial contamination, and may be used for iron removal for ground waters providing the removal is effective and the water is of satisfactory sanitary quality before treatment. (3-30-07)

01. Conditions of Use. Diatomaceous earth filters are expressly excluded from consideration for the following conditions: (3-30-07)

a. Bacteria removal; (3-30-07)

b. Color removal; (3-30-07)

c. Turbidity removal where either the gross quantity of turbidity is high or the turbidity exhibits poor filterability characteristics; or (3-30-07)

d. Filtration of waters with high algae counts. (3-30-07)

02. Treated Water Storage. Treated water storage capacity in excess of normal requirements shall be provided to allow operation of the filters at a uniform rate during all conditions of system demand at or below the approved filtration rate, and guarantee continuity of service during adverse raw water conditions without by-passing the system. (3-30-07)

03. Number of Units. The requirements of Subsection 521.03 shall apply to diatomaceous earth filtration. (5-8-09)

04. Precoat. A uniform precoat shall be applied hydraulically to each septum by introducing a slurry to the tank influent line and employing a filter-to-waste recirculation system. (3-30-07)

05. Body Feed. A body feed system to apply additional amounts of diatomaceous earth slurry during the filter run is required to avoid short filter runs or excessive head losses. (3-30-07)

a. The rate of body feed is dependent on raw water quality and characteristics and must be determined in the pilot plant study. (3-30-07)

b. Continuous mixing of the body feed slurry is required. (3-30-07)

06. Filtration Requirements. (3-30-07)

a. Rate of filtration shall be controlled by a positive means. (3-30-07)

b. Head loss shall not exceed thirty (30) psi for pressure diatomaceous earth filters, or a vacuum of fifteen (15) inches of mercury for a vacuum system. (3-30-07)

c. A recirculation or holding pump shall be employed to maintain differential pressure across the filter when the unit is not in operation in order to prevent the filter cake from dropping off the filter elements. A minimum recirculation rate of one-tenth (0.1) gallon per minute per square foot of filter area shall be provided. (3-30-07)

d. The septum or filter elements shall be structurally capable of withstanding maximum pressure and velocity variations during filtration and backwash cycles, and shall be spaced such that no less than one (1) inch is provided between elements or between any element and a wall. (3-30-07)

e. The filter influent shall be designed to prevent scour of the diatomaceous earth from the filter element. (3-30-07)

07. Backwash. A satisfactory method to thoroughly remove and dispose of spent filter cake shall be provided. (3-30-07)

08. Appurtenances. The following shall be provided for every filter: (3-30-07)

a. Sampling taps for raw and filtered water. (3-30-07)

b. Loss of head or differential pressure gauge. (3-30-07)

c. Rate-of-flow indicator. (3-30-07)

d. A throttling valve used to reduce rates below normal during adverse raw water conditions. (3-30-07)

e. Evaluation of the need for body feed, recirculation, and any other pumps. (3-30-07)

f. Provisions for filtering to waste with appropriate measures for backflow prevention. (3-30-07)

09. Monitoring. A continuous monitoring turbidimeter with recorder is required on each filter effluent for plants treating surface water. (3-30-07)

523. FACILITY AND DESIGN STANDARDS: SURFACE WATER TREATMENT: SLOW SAND FILTRATION.

The use of these filters shall require prior engineering studies to demonstrate the adequacy and suitability of this method of filtration for the specific water supply. Slow Sand Filtration and Diatomaceous Earth Filtration for Small Water Systems, Manual on Slow Sand Filtration, and Slow Sand Filtration referenced in Subsection 002.02, may be used as guidance in design of slow sand filtration facilities. (3-30-07)

01. Quality of Raw Water. Slow rate gravity filtration shall be limited to waters having maximum turbidities of ten (10) nephelometric units and maximum color of fifteen (15) units; such turbidity must not be attributable to colloidal clay. Raw water quality data must include examinations for algae. (3-30-07)

02. Number of Units. At least two (2) units shall be provided. Where only two (2) units are provided, each shall be capable of meeting the plant design capacity (normally the projected maximum daily demand) at the approved filtration rate. Where more than two (2) filter units are provided, the filters shall be capable of meeting the plant design capacity at the approved filtration rate with one (1) filter removed from service. (3-30-07)

03. Structural Details and Hydraulics. Slow rate gravity filters shall be so designed as to provide a cover, unless otherwise approved by the Department, headroom to permit normal movement by operating personnel

for scraping and sand removal operations, adequate access hatches and access ports for handling of sand and for ventilation, filtration to waste, an overflow at the maximum filter water level, and protection from freezing.(3-30-07)

04. Underdrains. Each filter unit shall be equipped with a main drain and an adequate number of lateral underdrains to collect the filtered water. The underdrains shall be so spaced that the maximum velocity of the water flow in the underdrain will not exceed three-fourths (0.75) feet per second. The maximum spacing of laterals shall not exceed three (3) feet if pipe laterals are used. (3-30-07)

05. Filter Material. The following requirements apply: (3-30-07)

a. A minimum depth of thirty (30) inches of filter sand shall be placed on graded gravel layers. (5-8-09)

b. The effective size shall be between fifteen hundredths (0.15) of a millimeter and thirty-five hundredths (0.35) of a millimeter. Larger sizes may be considered by the Department based on the results of pilot testing. (3-30-07)

c. The uniformity coefficient shall not exceed three point zero (3.0). (3-30-07)

d. The sand shall be cleaned and washed free from foreign matter. (3-30-07)

e. The sand shall be rebedded to the original minimum depth of thirty (30) inches when scraping has reduced the bed depth to no less than twenty-four (24) inches. Where sand is to be reused in order to provide biological seeding and shortening of the ripening process, rebedding shall utilize a “throw over” technique whereby new sand is placed on the support gravel and existing sand is replaced on top of the new sand. The maximum filtration rate shall not exceed zero point one (0.1) gallon per minute per square foot. (5-8-09)

06. Filter Sand Support. (5-8-09)

a. A three (3)-inch layer of sand shall be used as a supporting media for filter sand. The supporting sand shall have an effective size of zero point eight (0.8) millimeters to two point zero (2.0) millimeters and a uniformity coefficient not greater than one point seven (1.7). (5-8-09)

b. Gravel shall consist of cleaned and washed, hard, durable, rounded rock particles and shall not include flat or elongated particles. The coarsest gravel shall be two and one-half (2.5) inches in size when the gravel rests directly on a lateral system and must extend above the top of the perforated laterals. Not less than four (4) layers of gravel shall be provided in accordance with the size and depth distribution specified in the table below. Reduction of gravel depths and other size gradations may be considered upon justification to the Department.

Size of Gravel	Depth
2 1/2 to 1 1/2 inches	5 to 8 inches
1 1/2 to 3/4 inches	3 to 5 inches
3/4 to 1/2 inches	3 to 5 inches
1/2 to 3/16 inches	2 to 3 inches
3/16 to 3/32 inches	2 to 3 inches

(5-8-09)

07. Depth of Water Over Filter Beds. The design shall provide a depth of at least three (3) to six (6) feet of water over the sand. Influent water shall not scour the sand surface. (3-30-07)

08. Control Appurtenances. Each filter shall be equipped with a loss of head gauge, an orifice, Venturi meter, or other suitable means of discharge measurement installed on each filter to control the rate of

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filtration, and an effluent pipe designed to maintain the water level above the top of the filter sand. (3-30-07)

09. Ripening. Slow sand filters shall be operated to waste after scraping or rebedding during a ripening period until the filter effluent turbidity falls to consistently below the regulated drinking water standard established for the system. (3-30-07)

10. Supernatant Drain Required. Filter beds shall be equipped with a supernatant drain to allow for quick removal of water standing over sand that has become impermeable because it requires scraping or rebedding. (3-30-07)

524. FACILITY AND DESIGN STANDARDS: SURFACE WATER TREATMENT: DIRECT FILTRATION.

Direct filtration, as used herein, refers to the filtration of a surface water following chemical coagulation and possibly flocculation but without prior settling. The nature of the treatment process will depend upon the raw water quality. A full scale direct filtration plant shall not be constructed without prior pilot studies which are acceptable to the reviewing authority. In-plant demonstration studies are required where conventional treatment plants are converted to direct filtration. Where direct filtration is proposed, an engineering report shall be submitted prior to conducting pilot plant or in-plant demonstration studies. (3-30-07)

01. Filtration Requirements. (3-30-07)

a. Filters shall be rapid rate gravity filters with dual or mixed media. The final filter design shall be based on the pilot plant or in-plant demonstration studies, and all portions of Section 518 apply. Pressure filters or single media sand filters shall not be used. (3-30-07)

b. A continuous recording turbidimeter shall be installed on each filter effluent line and on the composite filter effluent line. (3-30-07)

c. Additional continuous monitoring equipment such as particle counting or streaming current metering to assist in control of coagulant dose may be required by the reviewing authority. (3-30-07)

02. Siting Requirements. The plant design and land ownership surrounding the plant shall allow for modifications of the plant. (3-30-07)

525. -- 529. (RESERVED).

530. FACILITY AND DESIGN STANDARDS: DISINFECTION OF DRINKING WATER.

Disinfection may be accomplished with gas and liquid chlorine, calcium or sodium hypochlorites, chlorine dioxide, ozone, or ultraviolet light. Other disinfecting agents will be considered, providing reliable application equipment is available and testing procedures for a residual are recognized in "Standard Methods for the Examination of Water and Wastewater," referenced in Subsection 002.02, or an equivalent means of measuring effectiveness exists. The required amount of primary disinfection needed shall be specified by the Department. Consideration must be given to the formation of disinfection by-products (DBP) when selecting the disinfectant. See Section 531, Facility Design Standards - Design Standards for Chemical Application. (3-30-07)

01. Chlorination. (3-30-07)

a. Chlorination equipment shall meet the following requirements: (3-30-07)

i. Solution-feed gas chlorinators or hypochlorite feeders of the positive displacement type must be provided. (3-30-07)

ii. Standby or backup equipment of sufficient capacity shall be available to replace the largest unit. Spare parts shall be on hand to replace parts subject to wear and breakage. (5-8-09)

iii. Automatic proportioning chlorinators will be required where the rate of flow or chlorine demand is not reasonably constant. (3-30-07)

iv. Each eductor (submerged jet pump) must be selected for the point of application with particular attention given to the quantity of chlorine to be added, the maximum injector waterflow, the total discharge back pressure, the injector operating pressure, and the size of the chlorine solution line. (3-30-07)

v. The chlorine solution injector/diffuser must be compatible with the point of application to provide a rapid and thorough mix with all the water being treated. (3-30-07)

vi. Automatic switch-over of chlorination treatment units shall be provided, where necessary, to assure continuous disinfection. (5-8-09)

b. Contact time and point of application requirements are as follows: (3-30-07)

i. Contact time sufficient to achieve the inactivation of target pathogens under the expected range of raw water pH and temperature variation must be demonstrated through tracer studies or other evaluations acceptable to the Department. Appendix E of EPA Guidance Manual for Compliance with the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources, referenced in Section 002.02, contains tables that may be used as guidance to develop contact time requirements for specific target organisms and disinfectants. Additional baffling can be added to new or existing basins to minimize short circuiting and increase contact time. (3-30-07)

ii. At plants treating surface water, except slow sand filtration systems, provisions shall be made for applying the disinfectant to the raw water, settled water, filtered water, and water entering the distribution system. Disinfectant application equipment shall be controlled by a flow sensing device so that injection of the disinfectant will not continue when the flow of water stops. (3-30-07)

iii. At a minimum, at plants treating ground water, provisions shall be made for applying the disinfectant to the contact chamber inlet. (5-8-09)

c. Chlorine residual test equipment recognized in the "Standard Methods for the Examination of Water and Wastewater," referenced in Subsection 002.02, shall be provided for use by the operator. All surface water treatment plants that serve a population greater that three thousand three hundred (3,300) must have equipment to measure chlorine residuals continuously entering the distribution system. A sample tap shall be provided to measure chlorine residual and shall be located at a point after receiving the required contact time and at or prior to the first service connection. (5-8-09)

d. Chlorinator piping requirements: (3-30-07)

i. Cross connection protection: The chlorinator water supply piping shall be designed to prevent contamination of the treated water supply by sources of questionable quality. At all facilities treating surface water, pre- and post-chlorination systems must be independent to prevent possible siphoning of partially treated water into the clear well. The water supply to each eductor shall have a separate shut-off valve. No master shut-off valve will be allowed. (3-30-07)

ii. The pipes carrying elemental liquid or dry gaseous chlorine under pressure must be Schedule 80 seamless steel tubing or other materials recommended by the Chlorine Institute (never use PVC). Rubber, PVC, polyethylene, or other materials recommended by the Chlorine Institute must be used for chlorine solution piping and fittings. Nylon products are not acceptable for any part of the chlorine solution piping system. (3-30-07)

02. Disinfection with Ozone. Systems that are required to maintain a disinfectant residual in the distribution system shall supplement ozone disinfection with a chemical disinfectant. (3-30-07)

a. The following are requirements for feed gas preparation: (3-30-07)

i. Feed gas can be air, oxygen enriched air, or high purity oxygen. Sources of high purity oxygen include purchased liquid oxygen conforming with AWWA Standard B-304; on site generation using cryogenic air separation; or temperature, pressure or vacuum swing (adsorptive separation) technology. In all cases, the design

engineer must ensure that the maximum dew point of -76°F (-60°C) will not be exceeded at any time. (3-30-07)

ii. Air compression: (3-30-07)

(1) Air compressors shall be of the liquid-ring or rotary lobe, oil-less, positive displacement type for smaller systems or dry rotary screw compressors for larger systems. (3-30-07)

(2) The air compressors shall have the capacity to simultaneously provide for maximum ozone demand, provide the air flow required for purging the desiccant dryers (where required) and allow for standby capacity. (3-30-07)

(3) Air feed for the compressor shall be drawn from a point protected from rain, condensation, mist, fog and contaminated air sources to minimize moisture and hydrocarbon content of the air supply. (3-30-07)

(4) A compressed air after-cooler, entrainment separator, or a combination of the two (2) with automatic drain shall be provided prior to the dryers to reduce the water vapor. (5-8-09)

(5) A back-up air compressor must be provided so that ozone generation is not interrupted in the event of a break-down. (3-30-07)

iii. Air drying: (3-30-07)

(1) Dry, dust-free and oil-free feed gas must be provided to the ozone generator. Dry gas is essential to prevent formation of nitric acid, to increase the efficiency of ozone generation and to prevent damage to the generator dielectrics. Sufficient drying to a maximum dew point of -76°F (-60°C) must be provided at the end of the drying cycle. (3-30-07)

(2) Drying for high pressure systems may be accomplished using heatless desiccant dryers only. For low pressure systems, a refrigeration air dryer in series with heat-reactivated desiccant dryers shall be used.(3-30-07)

(3) A refrigeration dryer capable of reducing inlet air temperature to 40°F (4°C) shall be provided for low pressure air preparation systems. The dryer can be of the compressed refrigerant type or chilled water type. (3-30-07)

(4) For heat-reactivated desiccant dryers, the unit shall contain two (2) desiccant filled towers complete with pressure relief valves, two (2) four-way valves and a heater. In addition, external type dryers shall have a cooler unit and blowers. The size of the unit shall be such that the specified dew point will be achieved during a minimum adsorption cycle time of sixteen (16) hours while operating at the maximum expected moisture loading conditions. (3-30-07)

(5) Multiple air dryers shall be provided so that the ozone generation is not interrupted in the event of dryer breakdown. (3-30-07)

(6) Each dryer shall be capable of venting “dry” gas to the atmosphere, prior to the ozone generator, to allow start-up when other dryers are “on-line.” (3-30-07)

iv. Air filters: (3-30-07)

(1) Air filters shall be provided on the suction side of the air compressors, between the air compressors and the dryers and between the dryers and the ozone generators. (3-30-07)

(2) The filter before the desiccant dryers shall be of the coalescing type and be capable of removing aerosol and particulates larger than 0.3 microns in diameter. The filter after the desiccant dryer shall be of the particulate type and be capable of removing all particulates greater than 0.1 microns in diameter, or smaller if specified by the generator manufacturer. (3-30-07)

v. Piping in the air preparation system can be common grade steel, seamless copper, stainless steel or

galvanized steel. The piping must be designed to withstand the maximum pressures in the air preparation system. (3-30-07)

b. The following requirements apply to the ozone generator: (3-30-07)

i. Capacity. (3-30-07)

(1) The production rating of the ozone generators shall be stated in pounds per day and kWhr per pound at a maximum cooling water temperature and maximum ozone concentration. (3-30-07)

(2) The design shall ensure that the minimum concentration of ozone in the generator exit gas will not be less than one (1) percent (by weight). (3-30-07)

(3) Generators shall be sized to have sufficient reserve capacity so that the system does not operate at peak capacity for extended periods of time resulting in premature breakdown of the dielectrics. (3-30-07)

(4) The production rate of ozone generators will decrease as the temperature of the coolant increases. If there is to be a variation in the supply temperature of the coolant throughout the year, then pertinent data shall be used to determine production changes due to the temperature change of the supplied coolant. The design shall ensure that the generators can produce the required ozone at maximum coolant temperature. (3-30-07)

(5) Appropriate ozone generator backup equipment must be provided. (3-30-07)

ii. Electrical. The generators can be low, medium or high frequency type. Specifications shall require that the transformers, electronic circuitry and other electrical hardware be proven, high quality components designed for ozone service. (3-30-07)

iii. Cooling. Adequate cooling shall be provided. The cooling water must be properly treated to minimize corrosion, scaling and microbiological fouling of the water side of the tubes. Where cooling water is treated, cross connection control shall be provided to prevent contamination of the potable water supply. (3-30-07)

iv. Materials. To prevent corrosion, the ozone generator shell and tubes shall be constructed of Type 316L stainless steel. (3-30-07)

c. The following requirements apply to ozone contactors: (3-30-07)

i. Bubble diffusers. (3-30-07)

(1) Where disinfection is the primary application, a minimum of two (2) contact chambers each equipped with baffles to prevent short circuiting and induce countercurrent flow shall be provided. Ozone shall be applied using porous-tube or dome diffusers. (3-30-07)

(2) The minimum contact time shall be ten (10) minutes. A shorter contact time (CT) may be approved by the Department if justified by appropriate design and "CT" considerations. (3-30-07)

(3) Where taste and odor control is of concern, multiple application points and contactors shall be considered. (3-30-07)

(4) Contactors shall be separate closed vessels that have no common walls with adjacent rooms. The contactor must be kept under negative pressure and sufficient ozone monitors shall be provided to protect worker safety. (3-30-07)

(5) Contact vessels can be made of reinforced concrete, stainless steel, fiberglass or other material which will be stable in the presence of residual ozone and ozone in the gas phase above the water level. If contact vessels are made of reinforced concrete, all reinforcement bars shall be covered with a minimum of one and one-half (1.5) inches of concrete. (3-30-07)

(6) Where necessary, a system shall be provided between the contactor and the off-gas destruct unit to remove froth from the air and return the other to the contactor or other location acceptable to the reviewing authority. If foaming is expected to be excessive, then a potable water spray system shall be placed in the contactor head space. (3-30-07)

(7) All openings into the contactor for pipe connections, hatchways, etc. shall be properly sealed using welds or ozone resistant gaskets such as Teflon or Hypalon. (3-30-07)

(8) Multiple sampling ports shall be provided to enable sampling of each compartment's effluent water and to confirm "CT" calculations. (3-30-07)

(9) A pressure/vacuum relief valve shall be provided in the contactor and piped to a location where there will be no damage to the destruction unit. (3-30-07)

(10) The depth of water in bubble diffuser contactors shall be a minimum of eighteen (18) feet. The contactor shall also have a minimum of three (3) feet of freeboard to allow for foaming. (3-30-07)

(11) All contactors shall have provisions for cleaning, maintenance and drainage of the contactor. Each contactor compartment shall also be equipped with an access hatchway. (3-30-07)

(12) Aeration diffusers shall be fully serviceable by either cleaning or replacement. (3-30-07)

ii. Other contactors, such as the venturi or aspirating turbine mixer contactor, may be approved by the Department provided adequate ozone transfer is achieved and the required contact times and residuals can be met and verified. (3-30-07)

d. The following requirements apply to ozone destruction units: (3-30-07)

i. A system for treating the final off-gas from each contactor must be provided in order to meet safety and air quality standards. Acceptable systems include thermal destruction and thermal/catalytic destruction units. (3-30-07)

ii. The maximum allowable ozone concentration in the discharge is 0.1 ppm (by volume). (3-30-07)

iii. At least two (2) units shall be provided which are each capable of handling the entire gas flow. (3-30-07)

iv. Exhaust blowers shall be provided in order to draw off-gas from the contactor into the destruct unit. (3-30-07)

v. Catalysts must be protected from froth, moisture and other impurities which may harm the catalyst. (3-30-07)

vi. The catalyst and heating elements shall be located where they can easily be reached for maintenance. (3-30-07)

e. Piping materials: Only low carbon 304L and 316L stainless steels shall be used for ozone service with 316L preferred. (3-30-07)

f. The following requirements apply to joints and connections: (3-30-07)

i. Connections on piping used for ozone service are to be welded where possible. (3-30-07)

ii. Connections with meters, valves or other equipment are to be made with flanged joints with ozone resistant gaskets, such as Teflon or Hypalon. Screwed fittings shall not be used because of their tendency to leak. (3-30-07)

iii. A positive closing plug or butterfly valve plus a leak-proof check valve shall be provided in the piping between the generator and the contactor to prevent moisture reaching the generator. (3-30-07)

g. The following requirements apply to instrumentation: (3-30-07)

i. Pressure gauges shall be provided at the discharge from the air compressor, at the inlet to the refrigeration dryers, at the inlet and outlet of the desiccant dryers, at the inlet to the ozone generators and contactors, and at the inlet to the ozone destruction unit. (3-30-07)

ii. Each generator shall have a trip which shuts down the generator when the wattage exceeds a certain preset level. (3-30-07)

iii. Dew point monitors shall be provided for measuring the moisture of the feed gas from the desiccant dryers. Where there is potential for moisture entering the ozone generator from downstream of the unit or where moisture accumulation can occur in the generator during shutdown, post-generator dew point monitors shall be used. (3-30-07)

iv. Air flow meters shall be provided for measuring air flow from the desiccant dryers to each of the other ozone generators, air flow to each contactor, and purge air flow to the desiccant dryers. (3-30-07)

v. Temperature gauges shall be provided for the inlet and outlet of the ozone cooling water and the inlet and outlet of the ozone generator feed gas and, if necessary, for the inlet and outlet of the ozone power supply cooling water. (3-30-07)

vi. Water flow meters shall be installed to monitor the flow of cooling water to the ozone generators and, if necessary, to the ozone power supply. (3-30-07)

vii. Ozone monitors shall be installed to measure zone concentration in both the feed-gas and off-gas from the contactor and in the off-gas from the destruct unit. For disinfection systems, monitors shall also be provided for monitoring ozone residuals in the water. The number and location of ozone residual monitors shall be such that the amount of time that the water is in contact with the ozone residual can be determined. (3-30-07)

viii. A minimum of one ambient ozone monitor shall be installed in the vicinity of the contactor and a minimum of one shall be installed in the vicinity of the generator. Ozone monitors shall also be installed in any areas where ozone gas may accumulate. (3-30-07)

h. Safety requirements are as follows: (3-30-07)

i. The maximum allowable ozone concentration in the air to which workers may be exposed must not exceed one-tenth part per million (0.1 ppm) by volume. (3-30-07)

ii. Noise levels resulting from the operating equipment of the ozonation system shall be controlled to within acceptable limits by special room construction and equipment isolation. (3-30-07)

iii. Emergency exhaust fans must be provided in the rooms containing the ozone generators to remove ozone gas if leakage occurs. (3-30-07)

iv. A sign shall be posted indicating "No smoking, oxygen in use" at all entrances to the treatment plant. In addition, no flammable or combustible materials shall be stored within the oxygen generator areas. (3-30-07)

03. Disinfection with Chlorine Dioxide. Chlorine dioxide may be considered as a primary and residual disinfectant, a pre-oxidant to control tastes and odors, to oxidize iron and manganese, and to control hydrogen sulfide and phenolic compounds. When choosing chlorine dioxide, consideration must be given to formation of the regulated by-products, chlorite and chlorate. (3-30-07)

a. Chlorine dioxide generation equipment shall be factory assembled pre-engineered units with a

minimum efficiency of ninety-five (95) percent. The excess free chlorine shall not exceed three (3) percent of the theoretical stoichiometric concentration required. (3-30-07)

b. Other design requirements include: (3-30-07)

i. The design shall comply with all applicable portions of Subsections 530.01.a. through 530.01.d. (3-30-07)

ii. The maximum residual disinfectant level allowed shall be zero point eight (0.8) milligrams per liter (mg/l), even for short term exposures. (3-30-07)

iii. Notification of a change in disinfection practices and the schedule for the changes shall be made known to the public; particularly to hospitals, kidney dialysis facilities and fish breeders, as chlorine dioxide and its by-products may have effects similar to chloramines. (3-30-07)

04. Other Disinfecting Agents. Proposals for use of disinfecting agents other than those listed shall be submitted to the Department for approval prior to preparation of final plans and specifications. (3-30-07)

531. FACILITY AND DESIGN STANDARDS: DESIGN STANDARDS FOR CHEMICAL APPLICATION.

01. General Equipment Design. General equipment design shall be such that: (3-30-07)

a. Feeders will be able to supply, at all times, the necessary amounts of chemicals at an accurate rate, throughout the range of feed. (3-30-07)

b. Chemical-contact materials and surfaces are resistant to the aggressiveness of the chemical solution. (3-30-07)

c. Corrosive chemicals are introduced in such a manner as to minimize potential for corrosion. (3-30-07)

d. Chemicals that are incompatible are not stored or handled together. At facilities where more than one (1) chemical is stored or handled, tanks and pipelines shall be clearly labeled to identify the chemical they contain. (3-30-07)

e. All chemicals are conducted from the feeder to the point of application in separate conduits. (3-30-07)

f. Chemical feeders are as near as practical to the feed point. (3-30-07)

g. Chemical feeders and pumps shall operate at no lower than twenty percent (20%) of the feed range unless two fully independent adjustment mechanisms such as pump pulse rate and stroke length are fitted when the pump shall operate at no lower than ten percent (10%) of the rated maximum. (3-30-07)

h. Spare parts shall be on hand for parts of feeders that are subject to frequent wear and damage. (5-8-09)

i. Redundant chemical feeders with automatic switchover shall be provided when necessary to ensure adequate treatment. (5-8-09)

02. Facility Design. (3-30-07)

a. Where chemical feed is necessary for the protection of the supply, such as disinfection, coagulation or other essential processes, a minimum of two feeders shall be provided and a separate feeder shall be used for each chemical applied. (3-30-07)

b. Chemical application control systems shall meet the following requirements: (3-30-07)

i. Feeders may be manually or automatically controlled, with automatic controls being designed so as to allow override by manual controls. (3-30-07)

ii. Chemical feeders shall be controlled by a flow sensing device so that injection of the chemicals will not continue when the flow of water stops. (3-30-07)

iii. Chemical feed rates shall be proportional to flow. (3-30-07)

iv. A means to measure water flow must be provided in order to determine chemical feed rates. (3-30-07)

v. Provisions shall be made for measuring the quantities of chemicals used. (3-30-07)

vi. Weighing scales shall be provided for weighing cylinders at all plants utilizing chlorine gas, fluoride solution feed. (3-30-07)

vii. Weighing scales shall be capable of providing reasonable precision in relation to average daily dose. (5-8-09)

viii. Where conditions warrant, for example with rapidly fluctuating intake turbidity, coagulant and coagulant aid addition may be made according to turbidity, streaming current or other sensed parameter. (3-30-07)

c. Dry chemical feeders shall measure chemicals volumetrically or gravimetrically, provide adequate solution water and agitation of the chemical in the solution pot, and completely enclose chemicals to prevent emission of dust to the operating room. (3-30-07)

d. Positive displacement type solution feed pumps must be capable of operating at the required maximum head conditions found at the point of injection. (3-30-07)

e. Liquid chemical feeders shall be such that chemical solutions cannot be siphoned or overfed into the water supply, by assuring discharge at a point of positive pressure, or providing vacuum relief, or providing a suitable air gap, or providing other suitable means or combinations as necessary. (3-30-07)

f. Cross connection control must be provided to assure that the following requirements are satisfied. (3-30-07)

i. The service water lines discharging to solution tanks shall be properly protected from backflow. (5-8-09)

ii. No direct connection exists between any sewer and a drain or overflow from the feeder, solution chamber or tank by providing that all drains terminate at least six (6) inches or two pipe diameters, whichever is greater, above the overflow rim of a receiving sump, conduit or waste receptacle. (3-30-07)

g. Chemical feed equipment shall be readily accessible for servicing, repair, and observation of operation. (3-30-07)

h. In-plant water supply for chemical mixing shall be: (3-30-07)

i. Ample in quantity and adequate in pressure. (3-30-07)

ii. Provided with means for measurement when preparing specific solution concentrations by dilution. (3-30-07)

iii. Properly treated for hardness, when necessary. (3-30-07)

iv. Properly protected against backflow. (3-30-07)

v. Obtained from a location sufficiently downstream of any chemical feed point to assure adequate mixing. (3-30-07)

i. Chemical storage facilities shall satisfy the following requirements: (3-30-07)

i. Storage tanks and pipelines for liquid chemicals shall be specified for use with individual chemicals and not used for different chemicals. Off-loading areas must be clearly labeled to prevent accidental cross-contamination. (3-30-07)

ii. Chemicals shall be stored in covered or unopened shipping containers, unless the chemical is transferred into an approved storage unit. (3-30-07)

j. Bulk liquid storage tanks shall comply with the following requirements: (5-8-09)

i. A means which is consistent with the nature of the chemical solution shall be provided in a solution tank to maintain a uniform strength of solution. Continuous agitation shall be provided to maintain slurries in suspension. (3-30-07)

ii. Means shall be provided to measure the liquid level in the tank. (3-30-07)

iii. Bulk liquid storage tanks shall be kept covered. Bulk liquid storage tanks with access openings shall have such openings curbed and fitted with overhanging covers. (5-8-09)

iv. Subsurface locations for bulk liquid storage tanks shall be free from sources of possible contamination, and assure positive drainage for ground waters, accumulated water, chemical spills and overflows. (5-8-09)

v. Bulk liquid storage tanks shall be vented, but shall not vent through vents common with day tanks. Acid storage tanks must be vented to the outside atmosphere, but not through vents in common with day tanks. (5-8-09)

vi. Each bulk liquid storage tank shall be provided with a valved drain, protected against backflow. (5-8-09)

vii. Bulk liquid storage tanks shall have an overflow that is turned downward with the end screened with a twenty-four (24) mesh or similar non-corrodible screen, have a free fall discharge, and be located where noticeable. (4-7-11)

viii. Bulk liquid storage tanks shall be provided with secondary containment so that chemicals from equipment failure, spillage, or accidental drainage shall be fully contained. A common receiving basin may be provided for each group of compatible chemicals. The bulk liquid storage tank basin or the common receiving basin shall provide a secondary containment volume sufficient to hold the volume of the largest storage tank. Piping shall be designed to minimize or contain chemical spills in the event of pipe ruptures. (5-8-09)

ix. Where chemical feed is necessary for the protection of the supply, a means to assure continuity of chemical supply while servicing a bulk liquid storage tank shall be provided. (5-8-09)

k. Day tanks are subject to the requirements in Subsections 531.02.k.i. through 531.02.k.iv. For the purposes of Section 531, day tanks are defined as liquid chemical tanks holding no more than a thirty (30) hour chemical supply. (5-8-09)

i. Day tanks shall be provided where bulk storage of liquid chemicals are provided. The Department may allow chemicals to be fed directly from shipping containers no larger than fifty-five (55) gallons. (5-8-09)

ii. Day tanks shall meet all the requirements of Subsection 531.02.j., with the exception of Subsection

531.02.j.viii. Shipping containers do not require overflow pipes or drains as required by Subsection 531.02.j. and are not subject to the requirements of Subsection 531.02.j.viii. (5-8-09)

iii. Where feasible, secondary containment shall be provided so that chemicals from equipment failure, spillage, or accidental drainage of day tanks shall be fully contained. A common receiving basin may be provided for each group of compatible chemicals. The common receiving basin shall provide a secondary containment volume sufficient to hold the volume of the largest storage tank. If secondary containment is not feasible, day tanks shall be located and protective curbings provided so that chemicals from equipment failure, spillage, or accidental drainage of day tanks shall not enter the water in conduits, treatment, or storage basins. Secondary containment is not required for a day tank if an Idaho licensed professional engineer demonstrates to the Department that the chemical concentration and volume, if spilled, will not be a safety hazard to employees, will not be hazardous to the public health, and will not harm the environment. (5-8-09)

iv. Day tanks and the tank refilling line entry points shall be clearly labeled with the name of the chemical contained. (5-8-09)

l. Provisions shall be made for measuring quantities of chemicals used to prepare feed solutions. (3-30-07)

m. Vents from feeders, storage facilities and equipment exhaust shall discharge to the outside atmosphere above grade and remote from air intakes. (3-30-07)

03. Chemicals. Chemical shipping containers shall be fully labeled to include chemical name, purity and concentration, supplier name and address, and evidence of ANSI/NSF certification where applicable. (3-30-07)

04. Safety Requirements for Chemical Facilities. (3-30-07)

a. The following requirements apply to chlorine gas feed and storage rooms: (3-30-07)

i. Each storage room shall be enclosed and separated from other operating areas. They shall be constructed in such a manner that all openings between the chlorine room and the remainder of the plant are sealed, and provided with doors equipped with panic hardware, assuring ready means of exit and opening outward only to the building exterior. (3-30-07)

ii. Each room shall be provided with a shatter resistant inspection window installed in an interior wall. (3-30-07)

iii. Each room shall have a ventilating fan with a capacity which provides one (1) complete air change per minute when the room is occupied. Where this is not appropriate due to the size of the room, a lesser rate may be allowed by the Department on a site specific basis. (3-30-07)

iv. The ventilating fan shall take suction near the floor as far as practical from the door and air inlet, with the point of discharge so located as not to contaminate air inlets to any rooms or structures. Air inlets shall be through louvers near the ceiling. (3-30-07)

v. Louvers for chlorine room air intake and exhaust shall facilitate airtight closure. (3-30-07)

vi. Separate switches for the fan and lights shall be located outside of the chlorine room and at the inspection window. Outside switches shall be protected from vandalism. A signal light indicating fan operation shall be provided at each entrance when the fan can be controlled from more than one (1) point. (3-30-07)

vii. Vents from feeders and storage shall discharge to the outside atmosphere, above grade. (3-30-07)

viii. Where provided, floor drains shall discharge to the outside of the building and shall not be connected to other internal or external drainage systems. (3-30-07)

ix. Chlorinator rooms shall be heated to sixty degrees Fahrenheit (60°F) and be protected from

excessive heat. Cylinders and gas lines shall be protected from temperatures above that of the feed equipment. (3-30-07)

x. Pressurized chlorine feed lines shall not carry chlorine gas beyond the chlorinator room. (3-30-07)

xi. Critical isolation valves shall be conspicuously marked and access kept unobstructed. (3-30-07)

xii. All chlorine rooms, buildings, and areas shall be posted with a prominent danger sign warning of the presence of chlorine. (3-30-07)

xiii. Full and empty cylinders of chlorine gas shall be isolated from operating areas and stored in definitely assigned places away from elevators, stairs, or gangways. They shall be restrained in position to prevent being knocked over or damaged by passing or falling objects. In addition, they shall be stored in rooms separate from ammonia storage, out of direct sunlight, and at least twenty (20) feet from highly combustible materials. Cylinders shall not be kept in unventilated enclosures such as lockers and cupboards. (3-30-07)

b. Where acids and caustics are used, they shall be kept in closed corrosion-resistant shipping containers or storage units. Acids and caustics shall not be handled in open vessels, but shall be pumped in undiluted form from original containers through suitable hose to the point of treatment or to a covered day tank. (3-30-07)

c. Sodium chlorite for chlorine dioxide generation. Proposals for the storage and use of sodium chlorite shall be approved by the Department prior to the preparation of final plans and specifications. Provisions shall be made for proper storage and handling of sodium chlorite to eliminate any danger of fire or explosion associated with its oxidizing nature. (3-30-07)

i. Chlorite (sodium chlorite) shall be stored by itself in a separate room. It must be stored away from organic materials. The storage structure shall be constructed of noncombustible materials. If the storage structure must be located in an area where a fire may occur, water must be available to keep the sodium chlorite area cool enough to prevent heat-induced explosive decomposition of the chlorite. (3-30-07)

ii. Care shall be taken to prevent spillage. An emergency plan of operation shall be available for the clean up of any spillage. Storage drums shall be thoroughly flushed prior to recycling or disposal. (3-30-07)

d. Where ammonium hydroxide is used, an exhaust fan shall be installed to withdraw air from high points in the room and makeup air shall be allowed to enter at a low point. The feed pump, regulators, and lines shall be fitted with pressure relief vents discharging outside the building away from any air intake and with water purge lines leading back to the headspace of the bulk storage tank. (3-30-07)

e. Where anhydrous ammonia is used, the storage and feed systems (including heaters where required) shall be enclosed and separated from other work areas and constructed of corrosion resistant materials. (3-30-07)

i. Pressurized ammonia feed lines shall be restricted to the ammonia room. (3-30-07)

ii. An emergency air exhaust system, as described in Subsection 531.04.a., but with an elevated intake, shall be provided in the ammonia storage room. (3-30-07)

iii. Leak detection systems shall be fitted in all areas through which ammonia is piped. (3-30-07)

iv. Special vacuum breaker/regulator provisions must be made to avoid potentially violent results of backflow of water into cylinders or storage tanks. (3-30-07)

v. Consideration shall be given to the provision of an emergency gas scrubber capable of absorbing the entire contents of the largest ammonia storage unit whenever there is a risk to the public as a result of potential ammonia leaks. (3-30-07)

05. Operator Safety. The Idaho General Safety and Health Standards, referenced in Subsection

002.02, may be used as guidance in designing facilities to ensure the safety of operators. The following requirements are in addition to the requirements of Subsection 501.12. (3-30-07)

a. Respiratory protection equipment, meeting the requirements of the National Institute for Occupational Safety and Health (NIOSH) shall be available where chlorine gas is handled, and shall be stored at a convenient heated location, but not inside any room where chlorine is used or stored. The units shall use compressed air, have at least a thirty (30) minute capacity, and be compatible with or exactly the same as units used by the fire department responsible for the plant. (3-30-07)

b. Chlorine leak detection. A bottle of concentrated ammonium hydroxide (fifty-six (56) per cent ammonia solution) shall be available for chlorine leak detection. Where ton containers are used, a leak repair kit approved by the Chlorine Institute shall be provided. (3-30-07)

c. Protective equipment. (3-30-07)

i. 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 shall be provided for each operator. (3-30-07)

ii. A deluge shower and eyewashing device shall be installed where strong acids and alkalis are used or stored. A water holding tank that will allow water to come to room temperature shall be installed in the water line feeding the deluge shower and eyewashing device. Other methods of water tempering will be considered on an individual basis. (5-8-09)

iii. For chemicals other than strong acids and alkalis, an appropriate eye washing device or station shall be provided. (5-8-09)

iv. Other protective equipment shall be provided as necessary. (3-30-07)

06. Design Requirements for Specific Applications. In addition to Subsection 531.01 through 531.03, the following design requirements apply for the specific applications within Subsection 531.06 of this rule. (5-8-09)

a. Sodium chlorite for chlorine dioxide generation. Positive displacement feeders shall be provided. Tubing for conveying sodium chlorite or chlorine dioxide solutions shall be Type 1 PVC, polyethylene or materials recommended by the manufacturer. Chemical feeders may be installed in chlorine rooms if sufficient space is provided. Otherwise, facilities meeting the requirements of chlorine rooms shall be provided. Feed lines shall be installed in a manner to prevent formation of gas pockets and shall terminate at a point of positive pressure. Check valves shall be provided to prevent the backflow of chlorine into the sodium chlorite line. (3-30-07)

b. Hypochlorite facilities shall meet the following requirements: (5-8-09)

i. Hypochlorite shall be stored in the original shipping containers or in hypochlorite compatible containers. Storage containers or tanks shall be sited out of the sunlight in a cool and ventilated area. (5-8-09)

ii. Stored hypochlorite shall be pumped undiluted to the point of addition. Where dilution is unavoidable, deionized or softened water shall be used. (3-30-07)

iii. Storage areas, tanks, and pipe work shall be designed to avoid the possibility of uncontrolled discharges and a sufficient amount of appropriately selected spill absorbent shall be stored on-site. (3-30-07)

iv. Hypochlorite feeders shall be positive displacement pumps with compatible materials for wetted surfaces. (5-8-09)

v. To avoid air locking in smaller installations, small diameter suction lines shall be used with foot valves and degassing pump heads. In larger installations flooded suction shall be used with pipe work arranged to ease escape of gas bubbles. Calibration tubes or mass flow monitors which allow for direct physical checking of actual feed rates shall be fitted. (3-30-07)

vi. Injectors shall be made removable for regular cleaning where hard water is to be treated. (3-30-07)

c. When ammonium sulfate is used, the tank and dosing equipment contact surfaces shall be made of corrosion resistant non-metallic materials. Provision shall be made for removal of the agitator after dissolving the solid. The tank shall be fitted with a lid and vented outdoors. Injection of the solution should take place in the center of treated water flow at a location where there is high velocity movement. (3-30-07)

d. When aqua ammonia (ammonium hydroxide) is used, the feed pumps and storage shall be enclosed and separated from other operating areas. The aqua ammonia room shall be equipped as required for chlorinator rooms with the following changes: (3-30-07)

i. A corrosion resistant, closed, unpressurized tank shall be used for bulk storage, vented through an inert liquid trap to a high point outside and an incompatible connector, or lockout provisions shall be made to prevent accidental addition of other chemicals to the storage tank. (3-30-07)

ii. The storage tank shall be designed to avoid conditions where temperature increases cause the ammonia vapor pressure over the aqua ammonia to exceed atmospheric pressure. This capability can be provided by cooling/refrigeration or diluting or mixing the contents with water without opening the system. (5-8-09)

iii. The aqua ammonia shall be conveyed direct from storage to the treated water stream injector without the use of a carrier water stream unless the carrier stream is softened. (3-30-07)

iv. The point of delivery to the main water stream shall be placed in a region of turbulent water flow. (3-30-07)

v. Provisions shall be made for easy access for removal of calcium scale deposits from the injector. (3-30-07)

532. FACILITY AND DESIGN STANDARDS: DESIGN STANDARDS FOR SOFTENING.

The softening process selected must be based upon the mineral qualities of the raw water and the desired finished water quality in conjunction with requirements for disposal of sludge or brine waste, cost of plant, cost of chemicals and plant location. Applicability of the process chosen shall be demonstrated. (3-30-07)

01. Lime or Lime-Soda Process. Rapid mix, flocculation, and sedimentation processes shall meet the requirements of Section 520. In addition the following requirements must be met: (3-30-07)

a. When split treatment is used, an accurate means of measuring and splitting the flow must be provided. (3-30-07)

b. Rapid mix basins must provide not more than thirty (30) seconds detention time with adequate velocity gradients to keep the lime particles dispersed. (3-30-07)

c. Equipment for stabilization of water softened by the lime or lime-soda process is required, see Section 537. (3-30-07)

d. Mechanical sludge removal equipment shall be provided in the sedimentation basin. (3-30-07)

e. Provisions must be included for proper disposal of softening sludges; see Section 540. (3-30-07)

f. The plant processes must be manually started following shut-down. (3-30-07)

02. Cation Exchange Process. (3-30-07)

a. Pre-treatment is required when the content of iron, manganese, or a combination of the two, is one milligram per liter (1 mg/l) or more. (3-30-07)

b. The units may be of pressure or gravity type, of either an upflow or downflow design. Automatic regeneration based on volume of water softened shall be used unless manual regeneration is justified and is approved by the Department. A manual override shall be provided on all automatic controls. (3-30-07)

c. Rate-of-flow controllers or the equivalent shall be used to control the hydraulic loading of cation exchange units. (3-30-07)

d. The bottoms, strainer systems and support for the exchange resin shall conform to the criteria provided for rapid rate gravity filters in Section 521. (3-30-07)

e. Cross Connection Control. Backwash, rinse and air relief discharge pipes shall be installed in such a manner as to prevent any possibility of back-siphonage. (3-30-07)

f. A bypass must be provided around softening units to produce a blended water of desirable hardness. Totalizing meters must be installed on the bypass line and on each softener unit. The bypass line must have a shutoff valve. (3-30-07)

g. When the applied water contains a chlorine residual, the cation exchange resin shall be a type that is not damaged by residual chlorine. (3-30-07)

h. Smooth-nose sampling taps must be provided for the collection of representative samples. The taps shall be located to provide for sampling of the softener influent, effluent, blended water, and on the brine tank discharge piping. The sampling taps for the blended water shall be at least twenty (20) feet downstream from the point of blending. Petcocks are not acceptable as sampling taps. (3-30-07)

i. Brine and salt storage tanks shall meet the following requirements: (3-30-07)

i. Salt dissolving or brine tanks and wet salt storage tanks must be covered and must be corrosion-resistant. (3-30-07)

ii. The make-up water inlet must be protected from back-siphonage. (3-30-07)

iii. Wet salt storage basins must be equipped with manholes or hatchways for access and for direct dumping of salt from truck or railcar. Openings must be provided with raised curbs and watertight covers having overlapping edges similar to those required for finished water reservoirs. (3-30-07)

iv. Overflows, where provided, must be protected with twenty-four (24) mesh or similar non-corrodible screens, and must terminate with either a turned downed bend having a proper free fall discharge or a self-closing flap valve. (4-7-11)

v. The salt shall be supported on graduated layers of gravel placed over a brine collection system. (3-30-07)

vi. Alternative designs which are conducive to frequent cleaning of the wet salt storage tank may be considered. (3-30-07)

vii. An eductor may be used to transfer brine from the brine tank to the softeners. If a pump is used, a brine measuring tank or means of metering shall be provided to obtain the proper dilution. (3-30-07)

j. Suitable disposal must be provided for brine waste; see Section 540. Where the volume of spent brine must be reduced, consideration may be given to using a part of the spent liquid concentrate for a subsequent regeneration. (3-30-07)

k. Pipes and contact materials must be resistant to the aggressiveness of salt. Plastic and red brass are acceptable piping materials. Steel and concrete must be coated with a non-leaching protective coating which is compatible with salt and brine. (3-30-07)

l. Bagged salt and dry bulk salt storage shall be enclosed and separated from other operating areas in order to prevent damage to equipment. (3-30-07)

533. FACILITY AND DESIGN STANDARDS: DESIGN STANDARDS FOR TASTE AND ODOR CONTROL.
Provision shall be made for the control of taste and odor. Chemicals shall be added sufficiently ahead of other treatment processes to assure adequate contact time for an effective and economical use of the chemicals. Where severe taste and odor problems are encountered, in-plant studies, pilot plant studies, or both in-plant and pilot plant studies may be required. (5-8-09)

01. Chlorination. When using chlorination as a method of taste and odor control adequate contact time must be provided to complete the chemical reactions involved. (3-30-07)

02. Chlorine Dioxide. Provisions shall be made for proper storing and handling of the sodium chlorite, so as to eliminate any danger of explosion. (3-30-07)

03. Powdered Activated Carbon. (3-30-07)

a. The carbon can be added as a pre-mixed slurry or by means of a dry-feed machine as long as the carbon is properly wetted. (3-30-07)

b. Continuous agitation or resuspension equipment is necessary to keep the carbon from depositing in the slurry storage tank. (3-30-07)

c. Provision shall be made for adequate dust control. (3-30-07)

d. Powdered activated carbon shall be handled as a potentially combustible material. (3-30-07)

04. Granular Activated Carbon. Replacement of anthracite with GAC may be considered as a control measure for geosmin and methyl isoborneol (MIB) taste and odors from algae blooms in surface water applications. Demonstration studies are required by the Department. (3-30-07)

05. Copper Sulfate and Other Copper Compounds. Continuous or periodic treatment of surface water with copper compounds to kill algae or other growths shall be controlled to prevent copper in excess of one point zero (1.0) milligrams per liter as copper in the plant effluent or distribution system. Care shall be taken to assure an even distribution of the chemical within the treatment area. (3-30-07)

06. Potassium Permanganate. Application of potassium permanganate may be considered, providing the treatment shall be designed so that the products of the reaction are not visible in the finished water. (3-30-07)

07. Ozone. Ozonation may be used as a means of taste and odor control. Adequate contact time must be provided to complete the chemical reactions involved. (3-30-07)

08. Other Methods. Other methods of taste and odor control shall be made only after pilot plant tests and approval of the Department. (3-30-07)

534. FACILITY AND DESIGN STANDARDS: AERATION PROCESSES.
Public water systems that install aeration treatment are subject to the Rules of the Department of Environmental Quality, IDAPA 58.01.01, "Rules for the Control of Air Pollution in Idaho." The system owner or the design engineer shall contact one of the Department's regional offices for information on obtaining a permit or an exemption for the emissions resulting from the aeration process. General information may be found on the DEQ website http://www.deq.idaho.gov. (3-30-07)

01. Natural Draft Aeration. Design shall provide: (3-30-07)

a. Perforations in the distribution pan three sixteenths to one-half (3/16 – ½) inches in diameter, spaced one to three (1-3) inches on centers to maintain a six (6) inch water depth. (3-30-07)

b. For distribution of water uniformly over the top tray. (3-30-07)

c. Discharge through a series of three (3) or more trays with separation of trays not less than twelve (12) inches. (3-30-07)

d. Loading at a rate of one to five (1-5) gallons per minute for each square foot of total tray area. (3-30-07)

e. Trays with slotted, heavy wire (1/2 inch openings) mesh or perforated bottoms. (3-30-07)

f. Construction of durable material resistant to aggressiveness of the water and dissolved gases. (3-30-07)

g. Protection from insects by twenty-four (24) mesh or similar non-corrodible screen. (4-7-11)

02. Forced or Induced Draft Aeration. Devices shall be designed to: (3-30-07)

a. Include a blower with a weatherproof motor in a tight housing and screened enclosure. (3-30-07)

b. Ensure adequate counter current of air through the enclosed aerator column. (3-30-07)

c. Exhaust air directly to the outside atmosphere. (3-30-07)

d. Include a down-turned and twenty-four (24) mesh or similar non-corrodible screened air outlet and inlet. (4-7-11)

e. Be such that air introduced in the column shall be as free from obnoxious fumes, dust, and dirt as possible. (3-30-07)

f. Be such that sections of the aerator can be easily reached or removed for maintenance of the interior or installed in a separate aerator room. (3-30-07)

g. Provide loading at a rate of one to five (1-5) gallons per minute for each square foot of total tray area. (3-30-07)

h. Ensure that the water outlet is adequately sealed to prevent unwarranted loss of air. (3-30-07)

i. Discharge through a series of five (5) or more trays with separation of trays not less than six (6) inches or as approved by the Department. (3-30-07)

j. Provide distribution of water uniformly over the top tray. (3-30-07)

k. Be of durable material resistant to the aggressiveness of the water and dissolved gases. (3-30-07)

03. Spray Aeration. Design shall provide: (3-30-07)

a. A hydraulic head of between five (5) and twenty-five (25) feet. (3-30-07)

b. Nozzles, with the size, number, and spacing of the nozzles being dependent on the flowrate, space, and the amount of head available. (3-30-07)

c. Nozzle diameters in the range of one (1) to one and one-half (1.5) inches to minimize clogging. (3-30-07)

d. An enclosed basin to contain the spray. Any openings for ventilation must be protected with a twenty-four (24) mesh or similar non-corrodible screen. (4-7-11)

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04. Pressure Aeration. Pressure aeration may be used for oxidation purposes only if the pilot plant study indicates the method is applicable; it is not acceptable for removal of dissolved gases. Filters following pressure aeration must have adequate exhaust devices for release of air. Pressure aeration devices shall be designed to give thorough mixing of compressed air with water being treated and provide twenty-four (24) mesh or similar non-corrodible screened and filtered air, free of obnoxious fumes, dust, dirt and other contaminants. (4-7-11)

05. Packed Tower Aeration. Packed tower aeration may be used for the removal of volatile organic chemicals, trihalomethanes, carbon dioxide, and radon. Final design shall be based on the results of pilot studies and be approved by the Department. (3-30-07)

a. Process design criteria. (3-30-07)

i. Justification for the design parameters selected (i.e., height and diameter of unit, air to water ratio, packing depth, surface loading rate, etc.) shall be provided to the Department for review. The pilot study shall evaluate a variety of loading rates and air to water ratios at the peak contaminant concentration. Special consideration shall be given to removal efficiencies when multiple contaminations occur. Where there is considerable past performance data on the contaminant to be treated and there is a concentration level similar to previous projects, the Department may approve the process design based on use of appropriate calculations without pilot testing. (3-30-07)

ii. The tower shall be designed to reduce contaminants to below the maximum contaminant level and to the lowest practical level. (3-30-07)

iii. The type and size of the packing used in the full scale unit shall be the same as that used in the pilot study. (3-30-07)

iv. The maximum air to water ratio for which credit will be given is 80:1. (3-30-07)

v. The design shall consider potential fouling problems from calcium carbonate and iron precipitation and from bacterial growth. It may be necessary to provide pretreatment. Disinfection capability shall be provided prior to and after packed tower aeration. (3-30-07)

vi. The effects of temperature shall be considered. (3-30-07)

vii. Redundant packed tower aeration capacity at the design flowrate shall be provided. (3-30-07)

b. The tower may be constructed of stainless steel, concrete, aluminum, fiberglass or plastic. Uncoated carbon steel is not allowed. Towers constructed of light-weight materials shall be provided with adequate support to prevent damage from wind. Packing materials shall be resistant to the aggressiveness of the water, dissolved gases and cleaning materials and shall be suitable for contact with potable water. (3-30-07)

c. Water flow system. (3-30-07)

i. Water shall be distributed uniformly at the top of the tower using spray nozzles or orifice-type distributor trays that prevent short circuiting. (3-30-07)

ii. A mist eliminator shall be provided above the water distributor system. (3-30-07)

iii. A side wiper redistribution ring shall be provided at least every ten (10) feet in order to prevent water channeling along the tower wall and short circuiting. (3-30-07)

iv. Sample taps shall be provided in the influent and effluent piping. The sample taps shall satisfy the requirements of Subsection 501.09. (5-8-09)

v. The effluent sump, if provided, shall have easy access for cleaning purposes and be equipped with a drain valve. The drain shall not be connected directly to any storm or sanitary sewer. (3-30-07)

vi. The design shall prevent freezing of the influent riser and effluent piping when the unit is not operating. (3-30-07)

vii. The water flow to each tower shall be metered. (3-30-07)

viii. An overflow line shall be provided which discharges twelve (12) to fourteen (14) inches above a splash pad or drainage inlet. Proper drainage shall be provided to prevent flooding of the area. (3-30-07)

ix. Means shall be provided to prevent flooding of the air blower. (3-30-07)

d. Air flow system. (3-30-07)

i. The air inlet to the blower and the tower discharge vent shall be down-turned and protected with a non-corrodible twenty-four (24) mesh screen to prevent contamination from extraneous matter. (3-30-07)

ii. The air inlet shall be in a protected location. (3-30-07)

iii. An air flow meter shall be provided on the influent air line or an alternative method to determine the air flow shall be provided. (3-30-07)

iv. A positive air flow sensing device and a pressure gauge must be installed on the air influent line. The positive air flow sensing device must be a part of an automatic control system which will turn off the influent water if positive air flow is not detected. The pressure gauge will serve as an indicator of fouling buildup. (3-30-07)

v. A backup motor for the air blower must be readily available. (3-30-07)

e. Other features that shall be provided: (3-30-07)

i. A sufficient number of access ports with a minimum diameter of twenty-four (24) inches to facilitate inspection, media replacement, media cleaning and maintenance of the interior. (3-30-07)

ii. A method of cleaning the packing material when iron, manganese, or calcium carbonate fouling may occur. (3-30-07)

iii. Tower effluent collection and pumping wells constructed to clearwell standards. (3-30-07)

iv. Provisions for extending the tower height without major reconstruction. (3-30-07)

v. No bypass shall be provided unless specifically approved by the Department. (3-30-07)

vi. Disinfection and adequate contact time after the water has passed through the tower and prior to the distribution system. (3-30-07)

vii. Adequate packing support to allow free flow of water and to prevent deformation with deep packing heights. (3-30-07)

viii. Operation of the blower and disinfectant feeder equipment during power failures. (3-30-07)

ix. Adequate foundation to support the tower and lateral support to prevent overturning due to wind loading. (3-30-07)

x. Fencing and locking gate to prevent vandalism. (3-30-07)

xi. An access ladder with safety cage for inspection of the aerator including the exhaust port and de-mister. (3-30-07)

xii. Electrical interconnection between blower, disinfectant feeder and supply pump. (3-30-07)

06. Other Methods of Aeration. Other methods of aeration may be used if applicable to the treatment needs. Such methods include but are not restricted to spraying, diffused air, cascades and mechanical aeration. The treatment processes are subject to the approval of the Department. (3-30-07)

07. Protection of Aerators. All aerators except those discharging to lime softening or clarification plants shall be protected from contamination by birds, insects, wind borne debris, rainfall and water draining off the exterior of the aerator. (3-30-07)

08. Disinfection. Ground water supplies exposed to the atmosphere by aeration must receive disinfection as the minimum additional treatment. (3-30-07)

535. FACILITY AND DESIGN STANDARDS: DESIGN STANDARDS FOR IRON AND MANGANESE CONTROL SYSTEMS.

Iron and manganese control, as used herein, refers solely to treatment processes designed specifically for this purpose. The treatment process used will depend upon the character of the raw water. The selection of one (1) or more treatment processes must meet specific local conditions as determined by engineering investigations, including chemical analyses of representative samples of water to be treated, and receive the approval of the Department. The Department may require a pilot plant study in order to gather all information pertinent to the design. (3-30-07)

01. Removal by Oxidation, Detention and Filtration. (3-30-07)

a. Oxidation may be by aeration or by chemical oxidation with chlorine, potassium permanganate, ozone or chlorine dioxide. (3-30-07)

b. Detention time: (3-30-07)

i. A minimum detention time of thirty (30) minutes shall be provided following aeration to ensure that the oxidation reactions are as complete as possible. This minimum detention may be omitted only where a pilot plant study indicates no need for detention. The detention basin may be designed as a holding tank without provisions for sludge collection but with sufficient baffling to prevent short circuiting. (3-30-07)

ii. Sedimentation basins shall be provided when treating water with high iron or manganese content, or where chemical coagulation is used to reduce the load on the filters. Provisions for sludge removal shall be made. (5-8-09)

c. Filtration. Rapid rate pressure filters are normally used for iron and manganese removal. Pressure filters shall not be used in the filtration of surface or other polluted waters or following lime-soda softening. (3-30-07)

i. The rate of filtration shall not exceed three (3) gallons per minute per square foot of filter area except where in-plant testing as approved by the Department has demonstrated satisfactory results at higher rates. (3-30-07)

ii. The filters shall be designed to provide for: (3-30-07)

(1) Loss of head gauges on the inlet and outlet pipes of each battery of filters. (3-30-07)

(2) An easily readable meter or flow indicator on each battery of filters. (3-30-07)

(3) Filtration and backwashing of each filter individually with an arrangement of piping as simple as possible to accomplish these purposes. (3-30-07)

(4) Minimum side wall shell height of five (5) feet. A corresponding reduction in side wall height is acceptable where proprietary bottoms permit reduction of the gravel depth. (3-30-07)

(5) The top of the wash water collectors to be at least eighteen (18) inches above the surface of the

media, (3-30-07)

(6) The underdrain system to efficiently collect the filtered water and to uniformly distribute the backwash water at a rate not less than fifteen (15) gallons per minute per square foot of filter area. (3-30-07)

(7) Backwash flow indicators and controls that are easily readable while operating the control valves. (3-30-07)

(8) An air release valve on the highest point of each filter. (3-30-07)

(9) An accessible manhole to facilitate inspection and repairs for filters thirty-six (36) inches or more in diameter. Sufficient handholds shall be provided for filters less than thirty-six (36) inches in diameter. (3-30-07)

(10) A means to observe the wastewater during backwashing and construction to prevent cross connection. (3-30-07)

02. Removal by Manganese Coated Media Filtration. This process consists of a continuous or batch feed of potassium permanganate to the influent of a manganese coated media filter. (3-30-07)

a. Other oxidizing agents or processes such as chlorination or aeration may be used prior to the permanganate feed to reduce the cost of the chemical. (3-30-07)

b. An anthracite media cap of at least six (6) inches or more as required by the Department shall be provided over manganese coated media. (3-30-07)

c. Normal filtration rate shall be three (3) gallons per minute per square foot. (3-30-07)

d. Normal wash rate shall be eight (8) to ten (10) gallons per minute per square foot with manganese greensand and fifteen (15) to twenty (20) gallons per minute with manganese coated media. (3-30-07)

e. Sample taps shall be provided prior to application of permanganate, immediately ahead of filtration, at points between the anthracite media, and at the filter effluent. The sample taps shall satisfy the requirements of Subsection 501.09. (5-8-09)

03. Removal by Ion Exchange. This process is not acceptable where either the raw water or wash water contains dissolved oxygen or other oxidants. (3-30-07)

04. Biological Removal. Biofiltration to remove manganese, iron, or a combination of manganese and iron requires on-site piloting testing to establish effectiveness. The final filter design shall be based on the on-site pilot plant studies. (5-8-09)

05. Sequestration by Polyphosphates. This process shall not be used when iron, manganese or a combination thereof exceeds one point zero (1.0) mg/l. The total phosphate applied shall not exceed ten (10) mg/l as PO_4. Where phosphate treatment is used, satisfactory chlorine residuals shall be maintained in the distribution system. Possible adverse affects on corrosion must be addressed when phosphate addition is proposed for iron sequestering. (3-30-07)

a. Stock phosphate solution must be kept covered and disinfected by carrying approximately ten (10) mg/l free chlorine residual unless the phosphate is not able to support bacterial growth and the phosphate is being fed from the covered shipping container. Phosphate solutions having a pH of two point zero (2.0) or less may also be exempted from this requirement by the Department. (3-30-07)

b. Polyphosphates shall not be applied ahead of iron and manganese removal treatment. The point of application shall be prior to any aeration, oxidation or disinfection if no iron or manganese removal treatment is provided. (3-30-07)

06. Sequestration by Sodium Silicates. Sodium silicate sequestration of iron and manganese is

allowed only for ground water supplies prior to air contact. On-site pilot tests are required to determine the suitability of sodium silicate for the particular water and the minimum feed needed. Rapid oxidation of the metal ions such as by chlorine or chlorine dioxide must accompany or closely precede the sodium silicate addition. (3-30-07)

a. Sodium silicate addition is applicable to waters containing up to two (2) mg/l of iron, manganese or combination thereof. (3-30-07)

b. Chlorine residuals shall be maintained throughout the distribution system to prevent biological breakdown of the sequestered iron. (3-30-07)

c. The amount of silicate added shall be limited to twenty (20) mg/l as SiO_2, but the amount of added and naturally occurring silicate shall not exceed sixty (60) mg/l as SiO_2. (3-30-07)

d. Sodium silicate shall not be applied ahead of iron or manganese removal treatment. (3-30-07)

07. Sampling Taps. Smooth-nosed sampling taps shall be provided for control purposes. Taps shall be located on each raw water source, each treatment unit influent and each treatment unit effluent. The sample taps shall satisfy the requirements of Subsection 501.09. (5-8-09)

536. FACILITY AND DESIGN STANDARDS: DESIGN STANDARDS FOR FLUORIDATION.

01. Chemical Feed Equipment and Methods. In addition to the requirements in Section 531, fluoride feed equipment shall meet the following requirements: (3-30-07)

a. Scales, loss-of-weight recorders or liquid level indicators, as appropriate, accurate to within five (5) percent of the average daily change in reading shall be provided for chemical feeds. (3-30-07)

b. The accuracy of chemical feeders used for fluoridation shall be plus or minus five (5) percent of the intended dose. (3-30-07)

c. Unsealed storage units for fluorosilicic acid shall be vented to the atmosphere at a point outside any building. (3-30-07)

d. Fluoride compound shall not be added before lime-soda softening or ion exchange softening. (3-30-07)

e. The point of application of fluorosilicic acid, if into a horizontal pipe, shall be in the lower half of the pipe. (3-30-07)

f. A fluoride solution shall be applied by a positive displacement pump having a stroke rate not less than twenty (20) strokes per minute, and at a feed rate not less than twenty (20) percent of the rated capacity of the feed pump. (3-30-07)

g. A spring opposed diaphragm type anti-siphon device shall be provided for all fluoride feed lines and dilution water lines. (3-30-07)

h. Except for constant flow systems, a device to measure the flow of water to be treated is required. (3-30-07)

i. The dilution water pipe shall terminate at least two (2) pipe diameters above the solution tank. (3-30-07)

j. Water used for sodium fluoride dissolution shall be softened if hardness exceeds seventy-five (75) mg/l as calcium carbonate. (3-30-07)

k. Fluoride solutions shall be injected at a point of continuous positive pressure or a suitable air gap provided. (3-30-07)

l. The electrical outlet used for the fluoride feed pump shall be interconnected with the well or service pump. (3-30-07)

m. Consideration shall be given to providing a separate room for fluorosilicic acid storage and feed. (3-30-07)

02. Secondary Controls. Secondary control systems for fluoride chemical feed devices shall be provided as a means of reducing the possibility for overfeed; these may include flow or pressure switches or other devices. (3-30-07)

03. Dust Control. Provision must be made for the transfer of dry fluoride compounds from shipping containers to storage bins or hoppers in such a way as to minimize the quantity of fluoride dust which may enter the room in which the equipment is installed. The enclosure shall be provided with an exhaust fan and dust filter which places the hopper under a negative pressure. Air exhausted from fluoride handling equipment shall discharge through a dust filter to the outside atmosphere of the building. (3-30-07)

537. FACILITY AND DESIGN STANDARDS: DESIGN STANDARDS FOR STABILIZATION.
Water that is unstable due either to natural causes or to subsequent treatment shall be stabilized. The expected treated water quality shall be evaluated to determine what, if any, treatment is necessary. (3-30-07)

01. Carbon Dioxide Addition. (3-30-07)

a. Recarbonation basin design shall provide the following: (3-30-07)

i. A total detention time of twenty (20) minutes. (3-30-07)

ii. A mixing compartment having a detention time of at least three (3) minutes. (3-30-07)

iii. A reaction compartment. (3-30-07)

iv. The mixing and reaction compartments shall have a depth sufficient to provide a diffuser submergence of not less than seven and one half (7.5) feet and no greater than the manufacturer's recommendation. (3-30-07)

b. Where liquid carbon dioxide is used, adequate precautions must be taken to prevent carbon dioxide from entering the plant from the recarbonation process. (3-30-07)

c. Recarbonation tanks shall be located outside or be sealed and vented to the outside with adequate seals and adequate purge flow of air to ensure workers safety. (3-30-07)

d. Provisions shall be made for draining the recarbonation basin and removing sludge. (3-30-07)

02. Phosphates. The feeding of phosphates may be used for sequestering calcium, for corrosion control, and in conjunction with alkali feed following ion exchange softening. (3-30-07)

a. Stock phosphate solution must be kept covered and disinfected by carrying approximately ten (10) mg/l free chlorine residual unless the phosphate is not able to support bacterial growth and the phosphate is being fed from the covered shipping container. Phosphate solutions having a pH of two point zero (2.0) or less are exempted from this requirement. (3-30-07)

b. Satisfactory chlorine residuals shall be maintained in the distribution system when phosphates are used. (3-30-07)

03. Split Treatment. Raw water may be blended with lime-softened water to partially stabilize the water prior to secondary clarification and filtration. Treatment plants designed to utilize split treatment shall also contain facilities for further stabilization by other methods. (3-30-07)

04. Water Unstable Due to Biochemical Action in Distribution System. Unstable water resulting from the bacterial decomposition of organic matter in water (especially in dead end mains), the biochemical action within tubercles, and the reduction of sulfates to sulfides shall be prevented by the maintenance of a free or combined chlorine residual throughout the distribution system. (5-8-09)

538. – 539. (RESERVED).

540. FACILITY AND DESIGN STANDARDS: DESIGN STANDARDS FOR TREATMENT AND DISPOSAL OF WASTE RESIDUALS.
Provisions must be made for proper disposal of water treatment plant waste such as sanitary, laboratory, clarification sludge, softening sludge, iron sludge, filter backwash water, and liquid concentrates. In locating waste disposal facilities, due consideration shall be given to preventing potential contamination of the water supply. (3-30-07)

01. Sanitary Waste. The sanitary waste from water treatment plants, pumping stations, and other waterworks installations must receive treatment. Waste from these facilities shall be discharged directly to a sanitary sewer system, when available and feasible, or to an adequate on-site waste treatment facility approved under the provisions of IDAPA 58.01.03, "Individual/Subsurface Sewage Disposal Rules." (3-30-07)

02. Liquid Concentrates. (3-30-07)

a. Waste from ion exchange plants, demineralization plants, reverse osmosis, or other plants which produce liquid concentrates may be disposed of by the following methods: (3-30-07)

i. Liquid concentrates that contain radionuclides must be further treated to remove the radioactive constituents as sludge. See Subsection 540.03.e. for disposal requirements for sludge that contains radionuclides. The residual liquids from which radionuclides have been removed may be disposed of in accordance with Subsections 540.02.a.ii. through 540.02.a.v. (3-30-07)

ii. Controlled discharge to a stream or other receiving water body if adequate dilution is available. Such discharge will require a National Pollution Elimination System Permit from the U.S. Environmental Protection Agency, Region 10, 1200 Sixth Avenue, Seattle, WA 98101, Telephone (206) 553-1200. (3-30-07)

iii. Liquid concentrates may be discharged to a sanitary sewer, if available and feasible. Acceptance of such waste must be approved by the sewer authority. (3-30-07)

iv. Subsurface disposal or land application of liquid concentrates may be permitted, but only if such discharge meets the requirements of IDAPA 58.01.03, "Individual/Subsurface Sewage Disposal Rules" for subsurface disposal or the requirements of IDAPA 58.01.17, "Recycled Water Rules" for land application. (5-8-09)

v. Liquid concentrates may be discharged to an injection well if in accordance with Rules of the Idaho Water Resources Board, IDAPA 37.03.03 "Rules and Minimum Standards for the Construction and Use of Injection Wells," referenced in Subsection 002.02. (3-30-07)

b. Should the nature of the liquid concentrate cause it to be ineligible for permitted discharge as described in Subsection 540.02.a., further onsite treatment of the liquid concentrate may be required in order to produce sludge and liquid waste that will meet the permit criteria for one (1) or more of the disposal options. (3-30-07)

03. Sludge Waste. Sludge is the solid waste resulting from coagulation, precipitation, or passive settling of liquid concentrates. Depending on composition, liquids remaining after sludge removal may be disposed of by methods described in Subsection 540.02, recycled through the treatment plant, or may be pure enough to be unregulated. The following methods of treatment and disposal apply to sludge: (3-30-07)

a. Precipitative Softening Sludge. (3-30-07)

i. At least two (2) temporary storage lagoons must be provided in order to give flexibility in

operation. Provisions must be made for convenient cleaning. An acceptable means of final sludge disposal must be provided. (3-30-07)

ii. Liquid or dewatered precipitative softening sludge may be applied to farm land if heavy metals or other contaminants do not exceed the requirements of IDAPA 58.01.02, "Water Quality Standards." (3-30-07)

iii. Dewatered precipitative softening sludge may be disposed of in a sanitary landfill in accordance with the requirements of IDAPA 58.01.06, "Solid Waste Management Rules." Acceptance of such waste is at the discretion of the landfill authority. (3-30-07)

b. Alum or Ferric Sludge. (3-30-07)

i. Temporary storage lagoons must contain at least two (2) compartments to facilitate independent filling and dewatering operations. Mechanical concentration may be considered. If mechanical dewatering is used, it shall be preceded by sludge concentration and chemical pre-treatment. A pilot plant study is required before the design of a mechanical dewatering installation. (3-30-07)

ii. Alum or ferric sludge may be discharged to a sanitary sewer if available and feasible. Acceptance of such waste must be approved by the sewer authority. (3-30-07)

iii. Dewatered alum or ferric sludge may be disposed of in a sanitary landfill in accordance with the requirements of IDAPA 58.01.06, "Solid Waste Management Rules." Acceptance of such waste is at the discretion of the landfill authority. (3-30-07)

iv. Alum or ferric sludge may be disposed of by land application if the permitting requirements of IDAPA 58.01.02, "Water Quality Standards," and IDAPA 58.01.17, "Recycled Water Rules," are met. (3-30-07)

v. Water removed from alum or ferric sludge may be disposed of in the same manner as liquid concentrates, as described in Subsection 540.02. (3-30-07)

c. Red Water. Red water is the waste filter wash water from iron and manganese removal plants. (3-30-07)

i. If sand filters are used they shall have the following features: (3-30-07)

(1) Total filter area shall be sufficient to adequately dewater applied solids. Unless the filter is small enough to be cleaned and returned to service in one (1) day, two (2) or more cells are required. (3-30-07)

(2) The "red water" filter shall have sufficient capacity to contain, above the level of the sand, the entire volume of wash water produced by washing all of the production filters in the plant, unless the production filters are washed on a rotating schedule and the flow through the production filters is regulated by true rate of flow controllers. Then sufficient volume shall be provided to properly dispose of the wash water involved. (3-30-07)

(3) Where freezing is a problem, provisions should be made for covering the filters during the winter months. (3-30-07)

(4) "Red water" filters shall not have common walls with finished water. (3-30-07)

ii. Subsurface infiltration lagoons may be permitted, but only if such discharge meets the requirements of IDAPA 58.01.03, "Individual/Subsurface Sewage Disposal Rules." (3-30-07)

iii. "Red water" may be discharged to a sanitary sewer if available and feasible. Acceptance of such waste must be approved by the sewer authority. Design shall prevent cross connections and there shall be no common walls between potable and non-potable water. (3-30-07)

d. Filter Backwash Water. (3-30-07)

i. Recycling is permitted if the backwash waters are returned to the head of the treatment plant or another entry point if supported by engineering studies. Backwash water shall be held for a sufficient time prior to recycling to allow solids to settle out. (3-30-07)

ii. Dewatered sludge from backwash water clarification processes may be disposed of in a sanitary landfill in accordance with the requirements of IDAPA 58.01.06, "Solid Waste Management Rules." Acceptance of such waste must be approved by the landfill authority. (3-30-07)

e. Radioactive Sludge. Waste residuals containing radioactive substances, including, but not limited to granular activated carbon used for radon removal or ion-exchange regeneration waste from uranium removal, must be disposed of in accordance with IDAPA 58.01.10, "Rules Regulating the Disposal of Radioactive Materials Not Regulated Under The Atomic Energy Act of 1954, As Amended." (3-30-07)

i. The buildup of radioactive materials such as uranium or radon and its decay products shall be considered and adequate shielding and safeguards shall be provided for operators and visitors. (3-30-07)

ii. Waste residuals containing naturally occurring radioactive materials that have been concentrated by human activities must be disposed of in an approved hazardous waste landfill (Class D), in accordance with the IDAPA 58.01.10, "Rules Regulating the Disposal of Radioactive Materials not Regulated Under the Atomic Energy Act of 1954, as Amended," and IDAPA 58.01.06, "Solid Waste Management Rules." (3-30-07)

iii. Waste residuals containing greater than point zero five (.05) percent by weight of uranium are subject to licensing and disposal under the regulations of the U.S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, TX 76011, Phone 817-860-8299. (3-30-07)

f. Arsenic Sludge. Solid waste residuals containing arsenic at a concentration less than five (5) mg/l may be disposed of at a sanitary landfill if permitted under IDAPA 58.01.06, "Solid Waste Management Rules." Solid waste containing arsenic at a concentration greater than five (5) mg/l must be disposed of at an approved hazardous waste landfill. Liquid wastes generated by arsenic treatment processes are subject to the handling and disposal requirements for liquid concentrates, as discussed under Subsection 540.02. (3-30-07)

04. Spent Media. Exhausted ion exchange media, adsorption media, disposable filters, and other components of treatment processes that contain concentrated contaminants shall be disposed of in accordance with IDAPA 58.01.06, "Solid Waste Management Rules," and/or IDAPA 58.01.10, "Rules Regulating the Disposal of Radioactive Materials not Regulated Under the Atomic Energy Act of 1954, as Amended." (3-30-07)

541. FACILITY AND DESIGN STANDARDS: PUMPING FACILITIES.

Pumping facilities shall be designed to maintain the sanitary quality of pumped water. (3-30-07)

01. Pump Houses. The following requirements apply to pump houses as defined in Section 003 unless it can be shown that some or all of these requirements are not needed to protect the combination of system components in a given structure: (3-30-07)

a. Pump houses shall be readily accessible for operation, maintenance, and repair at all times and under all weather conditions unless permitted to be out of service for a period of inaccessibility. (3-30-07)

b. Pump houses shall be protected from flooding and shall be adequately drained. The ground surface shall be graded so as to lead surface drainage away from the pump house. The floor surface shall be at least six (6) inches above the final ground surface. (3-30-07)

c. Pump houses shall be of durable construction, fire and weather resistant, and with outward-opening doors. All underground structures shall be waterproofed. (3-30-07)

d. Provisions shall be made for adequate heating for the comfort of the operator and the safe and efficient operation of the equipment. In pump houses not occupied by personnel, only enough heat need be provided to prevent freezing of equipment or treatment processes. (3-30-07)

e. Ventilation shall conform to existing local and/or state codes. Adequate ventilation shall be provided for all pumping stations for operator comfort and dissipation of excess heat and moisture from the equipment. In all cases, measures must be taken to minimize corrosion of metallic and electrical components. (3-30-07)

f. Pump houses shall be provided with a locking door or access to prohibit unauthorized entrance and shall be protected to prevent vandalism and entrance by animals. Plans and specifications for pump houses must provide enough detail to enable the reviewing engineer to determine that the facility is secure, safe, accessible, and that it conforms to electrical and plumbing codes. (3-30-07)

g. Pump houses shall be kept clean and in good repair and shall not be used to store toxic or hazardous materials other than those materials required for treatment processes. (3-30-07)

h. A suitable outlet shall be provided for drainage from pump glands without discharging onto the floor. (3-30-07)

i. Floor drains shall not be connected to sewers, storm drains, chlorination room drains, or any other source of contamination. Sumps for pump house floor drains shall not be closer than thirty (30) feet from any well. (3-30-07)

j. Adequate space shall be provided for the installation of potential additional units and for the safe and efficient servicing of all equipment. (5-8-09)

k. Suction basins shall be watertight, have floors sloped to permit removal of water and settled solids, be covered or otherwise protected against contamination, and have two (2) pumping compartments or other means to allow the suction basin to be taken out of service for inspection maintenance or repair. (3-30-07)

l. Pump houses shall be designed to allow efficient equipment servicing. Crain-ways, hoist beams, eyebolts, or other adequate facilities for servicing or removal of pumps, motors or other heavy equipment shall be provided. Openings in floors, roofs or wherever else shall be provided as needed for removal of heavy or bulky equipment. (3-30-07)

m. All remote controlled stations shall be electrically operated and controlled and shall have signaling apparatus of proven performance. Signaling apparatus shall report automatically when the station is out of service. (3-30-07)

n. Any threaded hose bib installed in the pump house must be equipped with an appropriate backflow prevention device. (3-30-07)

02. Pumping Units. At least two (2) pumping units shall be provided for raw water and surface source pumps. Pumps using seals containing mercury shall not be used in public drinking water system facilities. With any pump out of service, the remaining pump or pumps shall be capable of providing the peak hour demand of the system or a minimum of the maximum day demand plus equalization storage. See Subsection 501.18 for general design requirements concerning fire flow capacity and Subsection 501.07 regarding reliability and emergency operation. The pumping units shall meet the following requirements: (5-8-09)

a. The pumps shall have ample capacity to supply the maximum demand against the required pressure without dangerous overloading. (3-30-07)

b. The pumps shall be driven by prime movers able to meet the maximum horsepower condition of the pumps. (3-30-07)

c. The pumps shall be provided with readily available spare parts and tools. (3-30-07)

d. The pumps shall be served by control equipment that has proper heater and overload protection for air temperature encountered. (3-30-07)

e. Suction lift shall be avoided if possible. When suction lift is used, it shall be within the limits allowed by the manufacturer of the pumps, and provision shall be made for priming the pumps. (3-30-07)

f. Prime water must not be of lesser sanitary quality than that of the water being pumped. Means shall be provided to prevent either backpressure or backsiphonage backflow. When an air-operated ejector is used, the twenty-four (24) mesh or similar non-corrodible screened intake shall draw clean air from a point at least ten (10) feet above the ground or other source of possible contamination, unless the air is filtered by an apparatus approved by the reviewing authority. Vacuum priming may be used. (4-7-11)

03. Appurtenances. The following appurtenances shall be provided for all water pumps. Additional requirements specific to well pumps are provided in Section 511. (4-7-11)

a. Pumps shall be protected against freezing and valved to permit satisfactory operation, maintenance, and repair of the equipment. If foot valves are necessary, they shall have a net valve area of at least two and one-half (2.5) times the area of the suction pipe and they shall be screened. Each pump shall have an accessible check valve on the discharge side between the pump and the shut-off valve or a combination valve that performs both control valve and check valve functions. Surge relief measures shall be designed to minimize hydraulic transients. (4-7-11)

b. In general, piping shall be designed so that it will have watertight joints, be protected against surge or water hammer, be provided with suitable restraints where necessary, be designed so that friction losses will be minimized, and not be subject to contamination. Each pump shall have an individual suction line or the suction lines shall be manifolded such that they will ensure similar hydraulic and operating conditions. (3-30-07)

c. Each pump station shall have a standard pressure gauge on its discharge line and suction line. (3-30-07)

d. Water seals shall not be supplied with water of a lesser sanitary quality than that of the water being pumped. Where pumps are sealed with potable water and are pumping water of lesser sanitary quality, the seal shall: (3-30-07)

i. Be provided with either an approved reduced pressure principle backflow preventer or a break tank open to atmospheric pressure, (3-30-07)

ii. Where a break tank is provided, have an air gap of at least six (6) inches or two (2) pipe diameters, whichever is greater, between the feeder line and the flood rim of the tank. (3-30-07)

e. Pumps, their prime movers, and accessories shall be controlled in such a manner that they will operate at rated capacity without dangerous overload. Where two (2) or more pumps are installed, provision shall be made for alternation. Provision shall be made to prevent energizing the motor in the event of a backspin cycle. Equipment shall be provided or other arrangements made to prevent surge pressures from activating controls which switch on pumps or activate other equipment outside the normal design cycle of operation. (3-30-07)

04. Booster Pumps. In addition to other applicable requirements in Section 541, booster pumps must comply with the following: (3-30-07)

a. In-line booster pumps shall maintain an operating pressure that is consistent with the requirements specified in Subsection 552.01, and shall be supplied with an automatic cutoff when intake pressure is less than or equal to five (5) psi. (3-30-07)

b. Booster pumps with a suction line directly connected to any storage reservoirs shall be protected by an automatic cutoff to prevent pump damage and avoid excessive reservoir drawdown. (3-30-07)

c. Each booster pumping station shall contain not less than two (2) pumps with capacities such that peak hour demand, or a minimum of the maximum day demand plus equalization storage, can be satisfied with any pump out of service. See Subsection 501.18 for general design requirements concerning fire flow capacity. (5-8-09)

542. FACILITY AND DESIGN STANDARDS - DISTRIBUTION SYSTEM.

01. Protection from Contamination. The distribution system shall be protected from contamination and be designed to prevent contamination by steam condensate or cooling water from engine jackets or other heat exchange devices. (3-30-07)

02. Installation of Water Mains. Division 400 of "Idaho Standards for Public Works Construction," referenced in Subsection 002.02, may be used as guidance for installation of water mains. In addition, the following provisions shall apply: (3-30-07)

a. Installed pipe shall be pressure tested and leakage tested in accordance with the applicable AWWA Standards, incorporated by reference into these rules at Subsection 002.01. (3-30-07)

b. New, cleaned, and repaired water mains shall be disinfected in accordance with AWWA Standard C651, incorporated by reference into these rules at Subsection 002.01. The specifications shall include detailed procedures for the adequate flushing, disinfection, and microbiological testing of all water mains. (3-30-07)

c. In areas where aggressive soil conditions are suspected or known to exist, analyses shall be performed to determine the actual aggressiveness of the soil. If soils are found to be aggressive, action shall be taken to protect metallic joint restraints and the water main, such as encasement in polyethylene, provision of cathodic protection, or use of corrosion resistant materials. (3-30-07)

d. The Department must approve any interconnection between potable water supplies, taking into account differences in water quality between the two systems. (3-30-07)

e. A continuous and uniform bedding shall be provided in the trench for all buried pipe. Backfill material shall be tamped in layers around the pipe and to a sufficient height above the pipe to adequately support and protect the pipe. Stones found in the trench shall be removed for a depth of at least six (6) inches below the bottom of the pipe. (3-30-07)

f. Water mains shall be covered with sufficient earth or other insulation to prevent freezing. (3-30-07)

g. All tees, bends, plugs and hydrants shall be provided with reaction blocking, tie rods or joints designed to prevent movement. (3-30-07)

03. Pressure Relief Valves. All pumps connected directly to the distribution system shall be designed in conjunction with a water pressure relief valve of type, size, and material approved by the Department unless the Department approves another method that will prevent excessive pressure development. (3-30-07)

04. Flow Meter Required. Unless otherwise approved by the Department, all source pumps and booster pumps connected directly to the distribution system shall have an instantaneous and totalizing flow meter, equipped with nonvolatile memory, installed in accordance with manufacture's specifications. (4-7-11)

05. Pipe and Jointing Materials. Pipe and jointing materials comply with the standards set forth in Subsection 501.01. Pipe shall be manufactured of materials resistant internally and externally to corrosion and not imparting tastes, odors, color, or any contaminant into the system. Where distribution systems are installed in areas of ground water contaminated by organic compounds: (3-30-07)

a. Pipe and joint materials which do not allow permeation of the organic compounds shall be used; and (4-11-06)

b. Non-permeable materials shall be used for all portions of the system including pipe, joint materials, hydrant leads, and service connections. (4-11-06)

06. Size of Water Mains. When fire hydrants are provided, they shall not be connected to water mains smaller than six (6) inches in diameter, and fire hydrants shall not be installed unless fireflow volumes are available. If fire flow is not provided, water mains shall be no less than three (3) inches in diameter. Any departure from this minimum standard shall be supported by hydraulic analysis and detailed projections of water use. (3-30-07)

07. Separation of Potable and Non-Potable Pipelines. The relation between potable and non-potable pipelines shall be as described in Subsections 542.07.a. through 542.07.c. The Department will use the Memorandum of Understanding with the Plumbing Bureau as guidance in determining the relative responsibilities for reviewing service lines. The conditions of Subsections 542.07.a. and 542.07.b. shall apply to all potable services constructed or reconstructed after April 15, 2007 and where the Department or the QLPE is the reviewing authority. (5-8-09)

a. Parallel installation requirements. (5-8-09)

i. Potable mains in relation to non-potable mains. (5-8-09)

(1) Greater than ten (10) feet separation: no additional requirements based on separation distance. (5-8-09)

(2) Ten (10) feet to six (6) feet separation: separate trenches, with potable main above non-potable main, and non-potable main constructed with potable water class pipe. (5-8-09)

(3) Less than six (6) feet separation: design engineer to submit data to the Department for review and approval showing that this installation will protect public health and the environment and non-potable main to be constructed of potable water class pipe. (4-11-06)

(4) Non-potable mains are prohibited from being located in the same trench as potable mains. (3-30-07)

(5) Pressure wastewater mains or other pressurized mains or lines containing non-potable fluids shall be no closer horizontally than ten (10) feet from potable mains. (4-7-11)

ii. New potable services in relation to non-potable services, new potable services in relation to non-potable mains, and new non-potable services in relation to potable mains. (5-8-09)

(1) Greater than six (6) feet separation: no additional requirements based on separation distance. (5-8-09)

(2) Less than six (6) feet separation: design engineer to submit data that this installation will protect public health and the environment and non-potable service constructed with potable water class pipe. (5-8-09)

(3) New potable services are prohibited from being located in the same trench as non-potable mains or non-potable services. (5-8-09)

b. Requirements for potable water mains or services crossing non-potable water mains or services. For the purposes of this section, the term "pipeline" applies to both mains and services. (5-8-09)

i. If there is eighteen (18) inches or more vertical separation with the potable water pipeline above the non-potable pipeline, then the potable pipeline joints must be as far as possible from the non-potable water pipeline. (4-7-11)

ii. If there is eighteen (18) inches or more vertical separation with the potable water pipeline below the non-potable pipeline, then the potable pipeline joints must be as far as possible from the non-potable pipeline, and the non-potable pipeline must be supported through the crossing to prevent settling. (4-7-11)

iii. Less than eighteen (18) inches vertical separation: (5-8-09)

(1) Potable pipeline joint to be as far as possible from the non-potable pipeline; and either: (5-8-09)

(a) Non-potable pipeline constructed with potable water class pipe for a minimum of ten (10) feet either side of potable pipeline with a single twenty (20) foot section of potable water class pipe centered on the crossing; or (5-8-09)

(b) Sleeve non-potable or potable pipeline with potable water class pipe for ten (10) feet either side of crossing. Use of hydraulic cementitious materials such as concrete, controlled density fill, and concrete slurry encasement is not allowed as a substitute for sleeving. (5-8-09)

(2) If potable pipeline is below non-potable pipeline, the non-potable pipeline must also be supported through the crossing to prevent settling. (5-8-09)

iv. Pressure wastewater mains or other pressurized mains or lines containing non-potable fluids shall be no closer vertically than eighteen (18) inches from potable mains. (4-7-11)

c. Existing potable services in relation to new non-potable mains, existing non-potable services in relation to new potable mains, and existing potable services in relation to new non-potable services shall meet the requirements of Subsection 542.07.b., where practical, based on cost, construction factors, and public health significance. If the Department determines that there are significant health concerns with these services, such as where a large existing service serves an apartment building or a shopping center, then the design shall conform with Subsection 542.07.b. (5-8-09)

08. Separation from Subsurface Wastewater Systems and Other Sources of Contamination. A minimum horizontal distance of twenty-five (25) feet shall be maintained between any potable water pipe and a septic tank or subsurface wastewater disposal system. Guidance on separation from other potential sources of contamination, such as stormwater facilities, may be found on the DEQ website http://www.deq.idaho.gov. (3-30-07)

09. Dead End Mains. All dead end water mains shall be equipped with a means of flushing and shall be flushed at least semiannually at a water velocity of two and one-half (2.5) feet per second. (3-30-07)

a. Dead ends shall be minimized by making appropriate tie-ins whenever practical in order to provide increased reliability of service and reduce head loss. (4-11-06)

b. No water main flushing device shall be directly connected to any sewer. (4-11-06)

c. Stub outs for future main connections shall meet all requirements for dead end mains listed in Subsection 542.09 as determined by the Department. Flushing devices may be temporary in nature. (4-7-11)

10. Repair of Leaks. Leaking water mains shall be repaired or replaced upon discovery and disinfected in accordance with American Water Works Association (AWWA) Standards, incorporated by reference into these rules at Subsection 002.01. (3-30-07)

11. Separation from Structures. Water mains shall be separated by at least five (5) feet from buildings, industrial facilities, and other permanent structures. (3-30-07)

12. Meter Vault Required. All new public water systems shall include a meter vault at each service connection. A lockable shut-off valve shall be installed in the meter vault. This requirement shall also apply to extensions of the distribution system of existing public water systems. (3-30-07)

13. Minimum Pressure at Building Sites. Any public water system constructed or undergoing material modification where topographical relief may affect water pressure at the customers' premises shall provide the Department with an analysis which demonstrates that the pressure at each designated building site will be at least forty (40) psi, based on dynamic pressure in the main, as set forth in Subsections 552.01.b.i. and 552.01.b.ii., plus a static compensation from the elevation of the main to the elevation of each building site. (5-8-09)

a. If forty (40) psi cannot be provided at each designated building site, the Department may require that reasonable effort be made to provide notification to existing and potential customers of the expected pressure. (5-3-03)

b. The Department will not authorize a service connection at any designated building site where analysis indicates that pressure will be less than twenty (20) psi static pressure (or twenty-six point five (26.5) psi for

two (2) story buildings). (5-3-03)

14. Isolation Valves. A sufficient number of valves shall be provided on water mains to minimize inconvenience and sanitary hazards during repairs. (3-30-07)

15. Air Valves. At high points in water mains where air can accumulate, provisions shall be made to remove the air by means of air release and vacuum relief valves or combination air release/vacuum relief valves. Air release valves, vacuum relief valves, or combination air release/vacuum relief valves may not be required if vacuum relief and air release functions in the pipeline can be adequately handled by approved appurtenances such as fire hydrants. (5-8-09)

a. The open end of an air valve shall be extended to at least one (1) foot above grade and provided with a twenty-four (24) mesh or similar non-corrodible screened, downward-facing elbow. When the air vent on an air relief valve cannot be practically installed above ground, the vent may be below grade provided that the valve is manually operated and the air vent is extended to the top of the valve vault and provided with a twenty-four (24) mesh or similar non-corrodible screened, downward-facing elbow. In addition, for below ground vents, the valve vault must be rated for appropriate traffic loading in traffic areas and the vault drained to daylight or provided with adequate drainage to prevent flooding of the vault. (4-7-11)

b. Discharge piping from air valves or combination air release/vacuum relief valves shall not connect directly to any storm drain, storm sewer, or sanitary sewer. (4-7-11)

16. Backflow Protection. Automatic air relief valves shall be equipped with a means of backflow protection. (3-30-07)

17. Surface Water Crossings. For the purposes of Subsection 542.17, surface water is defined as all surface accumulations of water, natural or artificial, public or private, or parts thereof which are wholly or partially within, which flow through or border upon the state. This includes, but is not limited to, rivers, streams, canals, ditches, lakes, and ponds. Surface water crossings, whether over or under water, shall be constructed as follows: (5-8-09)

a. Above water crossings: the pipe shall be adequately supported and anchored, protected from damage and freezing, and shall be accessible for repair or replacement. (4-11-06)

b. Under water crossings: A minimum cover of two (2) feet shall be provided over the pipe. When crossing a water course that is greater than fifteen (15) feet in width, the following shall be provided: (4-11-06)

i. The pipe shall be of special construction, having flexible, restrained, or welded water-tight joints; and (4-11-06)

ii. Valves shall be provided at both ends of water crossings so that the section can be isolated for testing or repair; the valves shall be easily accessible and not subject to flooding; and (4-11-06)

iii. Permanent taps or other provisions to allow insertion of a small meter to determine leakage and obtain water samples shall be made on each side of the valve closest to the supply source. (4-11-06)

543. FACILITY AND DESIGN STANDARDS: CROSS CONNECTION CONTROL.

There shall be no connection between the distribution system and any pipes, pumps, hydrants, water loading stations, or tanks whereby unsafe water or other contaminating materials may be discharged or drawn into a public water system. The water purveyor is responsible through its cross connection control program to take reasonable and prudent measures to protect the water system against contamination and pollution from cross connections through premises isolation or containment, internal or in-plant isolation, fixture protection, or some combination of premises isolation, internal isolation, and fixture protection. (4-7-11)

01. Testable Assemblies. All double check valve backflow prevention assemblies, reduced pressure principle backflow prevention assemblies, spill resistant vacuum breakers, and pressure vacuum breakers used must pass a performance test conducted by the University of Southern California Foundation for Cross-Connection Control

and Hydraulic Research (USC Foundation) and be included on the USC Foundation "List of Approved Assemblies." (4-7-11)

02. Atmospheric Vacuum Breakers. All atmospheric vacuum breakers used shall be marked approved either by the International Association of Plumbing and Mechanical Officials (IAPMO) or by the American Society of Sanitation Engineers (ASSE). (5-8-09)

03. Replacement Parts and Components. All replacement parts and components, including resilient seated shutoff valves, shall meet original specifications or otherwise be approved by the USC Foundation as replacement parts or components for use on double check valve backflow prevention assemblies, reduced pressure principle backflow prevention assemblies, and pressure vacuum breakers. (4-7-11)

04. Assembly Selection. Appropriate and adequate backflow prevention assembly types for various facilities, fixtures, equipment, and uses of water should be selected from the Pacific Northwest Cross Connection Control Manual, the Uniform Plumbing Code, the AWWA Recommended Practice for Backflow Prevention and Cross Connection Control (M14), the USC Foundation Manual of Cross Connection Control, or other sources deemed acceptable by the Department. The selected assembly manufacturer model number must be included on the USC Foundation "List of Approved Assemblies" and must comply with local ordinances. (4-7-11)

544. FACILITY AND DESIGN STANDARDS: GENERAL DESIGN OF FINISHED WATER STORAGE. The materials and designs used for finished water storage structures shall provide stability and durability as well as protect the quality of the stored water. Finished water storage structures shall be designed to maintain water circulation and prevent water stagnation. Steel structures and facilities such as steel tanks, standpipes, reservoirs, and elevated tanks shall be designed and constructed in accordance with applicable AWWA Standards, incorporated by reference into these rules at Subsection 002.01. Other materials of construction are acceptable when properly designed to meet the requirements of Section 544. (5-8-09)

01. Sizing. Storage facilities shall have sufficient capacity, as determined from engineering studies that consider peak flows, fire flow capacity, and analysis of the need for various components of finished storage as defined under the term "Components of Finished Water Storage" in Section 003. The requirement for storage may be reduced when the source and treatment facilities have sufficient capacity with standby power to supply peak demands of the system. (3-30-07)

02. Location. Storage facilities shall be located in a manner that protects against contamination, ensures structural stability, protects against flooding, and provides year-round access by vehicles and equipment needed for repair and maintenance. (5-8-09)

a. If the bottom elevation of a storage reservoir must be below normal ground surface, it shall be placed above the seasonal high ground water table. (3-30-07)

b. Non-potable mains and services, standing water, and similar sources of possible contamination must be kept at least fifty (50) feet from any partially buried or below-ground storage structure or facility, except that non-potable mains and services constructed of potable water class pipe are allowed as close as twenty (20) feet from a partially buried or below-ground storage structure or facility. Partially buried or below-ground storage structures or facilities shall be located a minimum of fifty (50) feet from the nearest property line. (5-8-09)

c. No public water supply storage tank shall be located within five hundred (500) feet of any municipal or industrial wastewater treatment plant or any land which is spray irrigated with wastewater or used for sludge disposal. (3-30-07)

d. The top of a partially buried storage structure shall not be less than two (2) feet above normal ground surface. (3-30-07)

e. Ground-level or above-ground storage structures or facilities shall be located a minimum of twenty (20) feet from the nearest property line and a minimum of twenty (20) feet from any potential source of contamination. (5-8-09)

03. Protection from Contamination. All finished water storage structures shall have suitable watertight roofs which exclude birds, animals, insects, and excessive dust. The installation of appurtenances, such as antennas, shall be done in a manner that ensures no damage to the tank, coatings or water quality, or corrects any damage that occurred. (3-30-07)

04. Protection from Trespassers. Fencing, locks on access manholes, and other necessary precautions shall be provided to prevent trespassing, vandalism, and sabotage. (3-30-07)

05. Drains. No drain on a water storage structure may have a direct connection to a sewer or storm drain. The design shall allow draining the storage facility for cleaning or maintenance without causing loss of pressure in the distribution system. (3-30-07)

06. Overflow. Overflow pipes of any storage structure or facility shall discharge to daylight in a way that will preclude the possibility of backflow to the reservoir and, where practical, be provided with an expanded metal screen installed within the pipe that will exclude rodents and deter vandalism. The overflow pipe shall be of sufficient diameter to permit waste of water in excess of the filling rate. The overflow shall discharge over a drainage inlet structure or a splash plate and, when practical, discharge at an elevation between twelve (12) and twenty-four (24) inches above the receiving surface. (5-8-09)

a. When an internal overflow pipe is used on above-ground tanks, it shall be located in the access tube. (5-8-09)

b. The overflow for ground-level, partially buried, or below-ground storage structures or facilities shall have a vertical section of pipe at least two (2) pipe diameters in length and either: (5-8-09)

i. Be screened with a twenty-four (24) mesh non-corrodible screen installed within the pipe when practical or an expanded metal screen installed within the pipe plus a weighted flapper valve or check; or (5-8-09)

ii. Be an equivalent system acceptable to the Department. (5-8-09)

07. Access. Finished water storage structures shall be designed with reasonably convenient access to the interior for cleaning and maintenance. At least two (2) manholes shall be provided above the waterline at each water compartment where space permits, as determined by the Department. One (1) manhole may be allowed on smaller tanks on a case-by-case basis. (4-7-11)

a. The following access requirements apply to above-ground and ground-level storage structures. Each access manhole shall be framed a minimum of four (4) inches above the surface of the roof at the opening. The actual height above the surface of the roof must be sufficient to prevent incidental contamination from snow accumulation, storm water runoff or accumulation, irrigation water, or other potential sources of contamination. (5-8-09)

b. The following access requirements apply to, partially buried or below-ground storage structures. Each access manhole shall be elevated a minimum of twenty-four (24) inches above the surface of the roof or the ground level, whichever is higher. The actual height above the surface of the roof or the ground level must be sufficient to prevent incidental contamination from snow accumulation, storm water runoff or accumulation, irrigation water, or other potential sources of contamination. (5-8-09)

c. Each manhole shall be fitted with a solid water tight cover which overlaps a framed opening and extends down around the frame at least two (2) inches or otherwise prevents the entrance of contaminants. The frame should be at least four (4) inches high. Each cover shall be hinged on one side, and shall have a locking device. (4-7-11)

08. Vents. Finished water storage structures shall be vented. The overflow pipe shall not be considered a vent. Open construction between the sidewall and roof is not permissible. Vents shall: (3-30-07)

a. Prevent the entrance of surface water and rainwater and extend twelve (12) inches above the roof. (3-30-07)

b. Exclude birds and animals. (3-30-07)

c. Exclude insects and dust, as much as this function can be made compatible with effective venting. (3-30-07)

d. On ground-level, partially buried, or below-ground structures, open downward with the opening at least twenty-four (24) inches above the roof or the ground level and covered with twenty-four (24) mesh non-corrodible screen. The screen shall be installed within the pipe at a location least susceptible to vandalism. (5-8-09)

e. On above-ground tanks and standpipes, open downward, and be fitted with twenty-four (24) mesh or similar non-corrodible screen. (4-7-11)

09. Roof and Sidewall. The roof and sidewalls of all water storage structures must be watertight with no openings except properly constructed vents, manholes, overflows, risers, drains, pump mountings, control ports, or piping for inflow and outflow. Particular attention shall be given to the sealing of roof structures which are not integral to the tank body. (3-30-07)

a. Any pipes running through the roof or sidewall of a metal storage structure must be welded, or properly gasketed. In concrete tanks, these pipes shall be connected to standard wall castings which were poured in place during the forming of the concrete. (3-30-07)

b. Openings in the roof of a storage structure designed to accommodate control apparatus or pump columns shall be curbed and sleeved with proper additional shielding to prevent contamination from surface or floor drainage. (3-30-07)

c. The roof of the storage structure shall be sloped to facilitate drainage. Downspout pipes shall not enter or pass through the reservoir. Parapets, or similar construction which would tend to hold water and snow on the roof, will not be approved unless adequate waterproofing and drainage are provided. (3-30-07)

d. Reservoirs with pre-cast concrete roof structures must be made watertight with the use of a waterproof membrane or similar product. (3-30-07)

10. Construction Materials. Materials used in storage facility construction shall meet the requirements for water contact surfaces set forth in Subsection 501.01. Porous materials such as wood or concrete block are not acceptable for use in storage construction. (3-30-07)

11. Protection from Freezing. Finished water storage structures and their appurtenances, especially the riser pipes, overflows, and vents, shall be designed to prevent freezing which will interfere with proper functioning. (3-30-07)

12. Internal Catwalk. Every catwalk over finished water in a storage structure shall have a solid floor with sealed raised edges, designed to prevent contamination from shoe scrapings and dirt. (3-30-07)

13. Silt Stops. Removable silt stops shall be provided to prevent sediment from entering the reservoir discharge pipe. (3-30-07)

14. Grading. The area surrounding a ground-level, partially buried, or below-ground structures shall be graded in a manner that will prevent surface water from standing within fifty (50) feet of it. (5-8-09)

15. Coatings and Cathodic Protection. Proper protection shall be given to metal surfaces by paints or other protective coatings, by cathodic protective devices, or by both. (3-30-07)

16. Disinfection. Storage facilities shall be disinfected in accordance with AWWA Standard C652, incorporated by reference into these rules at Subsection 002.01. Two (2) or more successive sets of samples, taken at twenty-four (24) hour intervals, shall indicate microbiologically satisfactory water before the facility is placed into operation. (3-30-07)

17. Abandonment. All unused subsurface storage tanks shall be removed and backfilled, or abandoned by extracting residual fluids and filling the structure with sand or fine gravel. (3-30-07)

545. FACILITY AND DESIGN STANDARDS: TREATMENT PLANT STORAGE FACILITIES.
The design standards of Section 544 shall apply to treatment plant storage. (3-30-07)

01. Filter Wash Water. Filter wash water tanks shall be sized, in conjunction with available pump units and finished water storage, to provide the backwash water required by Section 521. Consideration must be given to the backwashing of several filters in rapid succession. (3-30-07)

02. Clearwell. When finished water storage is used to provide disinfectant contact time special attention must be given to tank size and baffling. An overflow and vent shall be provided. A minimum of two (2) clearwell compartments shall be provided to allow for cleaning or maintenance. Clearwells constructed under filters may be exempt from the requirements set out in Subsection 544.02.d. when the design provides adequate protection from contamination. (4-7-11)

03. Adjacent Storage. Finished or treated water must not be stored or conveyed in a compartment adjacent to untreated or partially treated water when the two (2) compartments are separated by a single wall, unless approved by the reviewing authority. (3-30-07)

04. Other Treatment Plant Storage Tanks. Unless otherwise allowed by the reviewing authority, other treatment plant storage tanks/basins such as detention basins, backwash reclaim tanks, receiving basins, and pump wet-wells for finished water shall be designed as finished water storage structures. In addition, these tanks/ basins shall be designed to allow for cleaning or maintenance through temporary tanks, standby pumping capabilities, or other means approved by the Department. (4-7-11)

546. FACILITY AND DESIGN STANDARDS: DISTRIBUTION SYSTEM STORAGE FACILITIES.

01. Design. The applicable design standards of Section 544 shall be followed for distribution system storage. (3-30-07)

02. Isolation. Finished water storage structures which provide pressure directly to the distribution system shall be designed so they can be isolated from the distribution system and drained for cleaning or maintenance without causing a loss of pressure in the distribution system. This requirement may be met through available temporary tanks, redundant pumping capabilities, or other temporary means approved by the Department. If the finished water storage structure provides fire flow for the water system, the water system owner shall provide the local fire authority advance notification of cleaning or maintenance events which isolate the structure from the distribution system and reduce available fire flow to less than the minimum required by the local fire authority. (4-7-11)

03. Drain. Drains shall discharge to daylight in a way that will preclude the possibility of backflow to the reservoir and, where practical, be provided with an expanded metal screen installed within the pipe that will exclude rodents and deter vandalism. The drain shall, when practical, discharge at an elevation between twelve (12) and twenty-four (24) inches above the receiving surface, and discharge over a drainage inlet structure or a splash plate. (5-8-09)

04. Level Controls. Adequate controls shall be provided to maintain levels in distribution system storage structures. Level indicating devices shall be provided at a central location. (3-30-07)

547. FACILITY AND DESIGN STANDARDS: HYDROPNEUMATIC TANK SYSTEMS.
Hydropneumatic tanks use compressed air to regulate pump cycling and to absorb pressure surges (water hammer). These tanks do not provide true storage. Systems serving more than one-hundred-fifty (150) homes are generally better served by providing reservoir storage, as set forth in Sections 544 and 547. (3-30-07)

01. General Design of Hydropneumatic Systems. (3-30-07)

a. Tanks shall be located above normal ground surface and be completely housed. (3-30-07)

b. Tanks shall have bypass piping to permit operation of the system while the tank is being repaired or painted. Exterior surfaces and accessible interior surfaces shall be provided with protective coatings and shall be maintained in good condition. Supports beneath tanks shall be structurally sound. (3-30-07)

c. Tanks shall be sized to limit pump cycles to not more than six (6) per hour unless a pump manufacturer's warranty specifically supports more frequent cycling. The number of pump cycles may be increased in systems with multiple pumps if a means to automatically alternate pumps is provided. The Franklin Electric AIM manual, referenced in Subsection 002.02, Chapter 11 of the Washington State Department of Health Water System Design Manual, referenced in Subsection 002.02, or manufacturer's recommendations may be used as guidance in calculating the size of hydropneumatic tanks. (3-30-07)

d. Tanks of greater than one-hundred twenty (120) gallons volume shall conform with the American Society of Mechanical Engineers (ASME) specifications code for unfired pressure vessels. Tanks of less than one hundred twenty (120) gallons volume shall meet the ASME code or be certified by a nationally recognized testing agency to be capable of withstanding twice the maximum allowable working pressure. (3-30-07)

02. Requirements Specific to Conventional Hydropneumatic Tanks. Conventional tanks are those that have a direct air to water interface and require periodic air recharge to compensate for absorption of air into the water. (3-30-07)

a. Each tank shall have an access manhole, a drain, and control equipment consisting of a pressure gauge, water sight glass, automatic or manual air blow-off, means for adding air that is filtered or otherwise protected from contamination, and pressure operated start-stop controls for the pumps. If tank size allows, the access manhole shall be at least twenty-four (24) inches in diameter. (3-30-07)

b. The gross volume of tanks in systems served by variable speed pumps may be less than that required for systems served by constant speed pumps. Design volumes shall be approved by the Department on a site-specific basis. (3-30-07)

03. Requirements Specific to Bladder Tanks. Bladder tanks have a membrane that separates air and water inside the tank. (3-30-07)

a. Bladder tanks must be pre-charged with air to a pressure of five (5) psi below the setting at which the pump turns on (the low operating pressure for the system). (3-30-07)

b. Each manifold assembly shall have a pressure gauge and pressure operated start-stop controls for the pumps. (3-30-07)

c. The procedure for sizing bladder tanks is to determine the number of a selected size of tanks that are needed to provide pump protection. Reduced tank volume in systems served by variable speed pumps shall be approved by the Department on a site specific basis. (3-30-07)

548. FACILITY AND DESIGN STANDARDS: DISINFECTION OF FACILITIES PRIOR TO USE.
Any supplier of water for a public water system shall ensure that new construction or modifications to an existing system shall be flushed and disinfected in accordance with American Water Works Association (AWWA) Standards, incorporated by reference into these rules at Subsection 002.01, prior to being placed into service. Disposal of chlorinated water from disinfection activities shall be coordinated with the DEQ Regional Office. (4-7-11)

549. -- 551. (RESERVED)

552. FACILITY AND DESIGN STANDARDS: OPERATING CRITERIA FOR PUBLIC WATER SYSTEMS.

01. Quantity and Pressure Requirements. Design requirements regarding pressure analysis are found in Section 542.13. (5-8-09)

a. Minimum Capacity. The capacity of a public drinking water system shall be at least eight hundred (800) gallons per day per residence. (5-8-09)

i. The minimum capacity of eight hundred (800) gallons per day shall be the design maximum day demand rate exclusive of irrigation and fire flow requirements. (5-8-09)

ii. The minimum capacity of eight hundred (800) gallons per day is only acceptable if the public drinking water system has equalization storage of finished water in sufficient quantity to compensate for the difference between a water system's maximum pumping capacity and peak hour demand. (5-8-09)

iii. The design capacity of a public drinking water system for material modifications may be less than eight hundred (800) gallons per day per residence if the water system owner provides information that demonstrates to the Department's satisfaction the maximum day demand for the system, exclusive of irrigation and fire flows, is less than eight hundred (800) gallons per day per residence. (5-8-09)

b. Pressure. All public water systems shall meet the following requirements: (4-7-11)

i. Any public water system shall be capable of providing sufficient water during maximum day demand conditions, including fire flow where provided, to maintain a minimum pressure of twenty (20) psi throughout the distribution system, at ground level, as measured at the service connection or along the property line adjacent to the consumer's premises. (4-7-11)

ii. When pressures within the system are known to have fallen below twenty (20) psi, the water system must provide public notice and disinfect the system. (4-7-11)

iii. If an initial investigation by the water system fails to discover the causes of inadequate or excessive pressure, the Department may require a public drinking water system to conduct a local pressure monitoring study to diagnose and correct pressure problems. Compliance with these requirements by water systems that do not have a meter vault or other point of access at the service connection or along the property line adjacent to the consumer's premises where pressure in the distribution system can be reliably measured shall be determined by measurements within the consumer's premises, or at another representative location acceptable to the Department. (4-7-11)

iv. Copies of pressure monitoring study reports required under Subsection 552.01.b.iii. detailing study results and any resulting corrective actions planned or performed by the public water system shall be submitted to the Department in accordance with these rules. (4-7-11)

v. The following public water systems or service areas of public water systems shall maintain a minimum pressure of forty (40) psi throughout the distribution system, during peak hour demand conditions, excluding fire flow, measured at the service connection or along the property line adjacent to the consumer's premises. (5-8-09)

(1) Any public water system constructed or substantially modified after July 1, 1985. (5-8-09)

(2) Any new service areas. (5-8-09)

(3) Any public water system that is undergoing material modification where it is feasible to meet the pressure requirements as part of the material modification. (5-8-09)

vi. Any public water system shall keep static pressure within the distribution system below one hundred (100) psi and should ordinarily keep static pressure below eighty (80) psi. Pressures above one hundred (100) psi shall be controlled by pressure reducing devices installed in the distribution main. The Department may approve the use of pressure reducing devices at individual service connections on a case by case basis, if it can be demonstrated that higher pressures in portions of the distribution system are required for efficient system operation. If system modification will cause pressure to routinely exceed eighty (80) psi, or if a check valve or an individual pressure reducing device is added to the service line, the water system owner shall notify affected customers. Notification may include reasons for the elevated pressure, problems or damage that elevated pressure can inflict on

appliances or plumbing systems, and suggested procedures or mitigation efforts affected property owners may initiate to minimize problems or damage. (4-7-11)

vii. The Department may allow the installation of booster pump systems at individual service connections on a case by case basis. However, such an installation may only occur with the full knowledge and agreement of the public water system, including assurance by the water system that the individual booster pump will cause no adverse effects on system operation. (4-11-06)

c. Fire Flows. Any public water system designed to provide fire flows shall ensure that such flows are compatible with the water demand of existing and planned fire fighting equipment and fire fighting practices in the area served by the system. (5-3-03)

d. Irrigation Flows. (12-1-92)

i. Any public water system constructed after November 1, 1977, shall be capable of providing water for uncontrolled, simultaneous foreseeable irrigation demand, which shall include all acreage that the system is designed to irrigate. (5-3-03)

(1) The Department must concur with assumptions regarding the acreage to be irrigated. In general, an assumption that no outside watering will occur is considered unsound and is unlikely to be approved. (5-3-03)

(2) An assumption of minimal outside watering, as in recreational subdivisions, may be acceptable if design flows are adequate for maintenance of "green zones" for protection against wildland fire. (5-3-03)

ii. The requirement of Subsection 552.01.d.i. may be modified by the Department if: (5-3-03)

(1) A separate irrigation system is provided; or (12-10-92)

(2) The supplier of water can regulate the rate of irrigation through its police powers, and the water system is designed to accommodate a regulated rate of irrigation flow. The Department may require the water system to submit a legal opinion addressing the enforceability of such police powers. (5-3-03)

iii. If a separate non-potable irrigation system is provided for the consumers, all mains, hydrants and appurtenances shall be easily identified as non-potable. The Department must concur with a plan to ensure that each new potable water service is not cross-connected with the irrigation system. (5-3-03)

02. Ground Water. (12-10-92)

a. Public water systems constructed after July 1, 1985, and supplied by ground water, shall treat water within the system by disinfection if the ground water source is not protected from contamination. (12-10-92)

b. The Department may, in its discretion, require disinfection for any existing public water system supplied by ground water if the system consistently exceeds the MCL for coliform, and if the system does not appear adequately protected from contamination. Adequate protection will be determined based upon at least the following factors: (12-10-92)

i. Location of possible sources of contamination; (12-10-92)

ii. Size of the well lot; (12-10-92)

iii. Depth of the source of water; (12-10-92)

iv. Bacteriological quality of the aquifer; (12-10-92)

v. Geological characteristics of the area; and (12-10-92)

vi. Adequacy of development of the source. (12-10-92)

03. Operating Criteria. The operating criteria for systems supplied by surface water or ground water under the direct influence of surface water shall be as follows: (12-10-92)

a. Each system must develop and follow a water treatment operations plan acceptable to the Department, by July 31, 1993, or within six (6) months of installation of filtration treatment, whichever is later. For a maximum of twelve (12) months, this may be a draft operations plan based on pilot studies or other criteria acceptable to the Department. After twelve (12) months the plan shall be finalized based on full scale operation. (12-10-92)

b. The purveyor shall ensure that treatment facilities are operated in accordance with good engineering practices such as those found in the Recommended Standards for Water Works, A Report of the Water Supply Committee of the Great Lakes - Upper Mississippi River Board of Public Health and Environmental Managers as set forth in Subsection 002.02.c., or other equal standard designated by the Department. (4-6-05)

c. New treatment facilities shall be operated in accordance with Subsection 552.03.b., and the system shall conduct monitoring specified by the Department for a trial period specified by the Department before serving water to the public in order to protect the health of consumers served by the system. (3-30-07)

04. Chlorination. Systems that regularly add chlorine to their water are subject to the provisions of Section 320. Systems using surface water or ground water under the direct influence of surface water, are subject to the disinfection requirements of Sections 300 and 518. (3-30-07)

a. Systems using only ground water that add chlorine for the purpose of disinfection, as defined in Section 003, are subject to the following requirements: (4-6-05)

i. Chlorinator capacity shall be such that the system is able to demonstrate that it is routinely achieving four (4) logs (ninety-nine point ninety-nine percent) (99.99%)) inactivation of viruses. The required contact time will be specified by the Department. This condition must be attainable even when the peak hour demand coincides with anticipated maximum chlorine demands. (5-8-09)

ii. A detectable chlorine residual shall be maintained throughout the distribution system. (4-6-05)

iii. Automatic proportioning chlorinators are required where the rate of flow is not reasonably constant. (12-10-92)

iv. Analysis for free chlorine residual shall be conducted at a location at or prior to the first service connection at least daily and records of these analyses shall be kept by the supplier of water for at least one (1) year. A report of all daily chlorine residual measurements for each calendar month shall be submitted to the Department no later than the tenth day of the following month. The frequency of measuring free chlorine residuals shall be sufficient to detect variations in chlorine demand or changes in water flow. (5-8-09)

v. A separate and ventilated room for gas chlorination equipment shall be provided. (12-10-92)

vi. The Department may, in its discretion, require a treatment rate higher than that specified in Subsection 552.04.a.i. (3-30-07)

vii. When chlorine gas is used, chlorine leak detection devices and safety equipment shall be provided and equipped with both an audible alarm and a warning light. (5-8-09)

viii. The Department may require redundant chlorine pumping capabilities with automatic switchover for systems with documented source water contamination problems and that lack adequate storage to supply the system during a pump failure. (5-8-09)

b. Systems using only ground water that add chlorine for the purpose of maintaining a disinfectant residual in the distribution system, when the source(s) is not at risk of microbial contamination, are subject to the following requirements: (4-6-05)

i. Automatic proportioning chlorinators are required where the rate of flow is not reasonably constant. (4-6-05)

ii. Analysis for free chlorine residual shall be made at a frequency that is sufficient to detect variations in chlorine demand or changes in water flow. (4-6-05)

c. Systems using only ground water that add chlorine for other purposes, such as oxidation of metals or taste and odor control, when the source(s) is known to be free of microbial contamination, must ensure that chlorine residual entering the distribution system after treatment is less than four (4.0) mg/L. The requirements in Subsection 552.04.b.ii. also apply if the system maintains a chlorine residual in the distribution system. (3-30-07)

05. Fluoridation. (12-1-92)

a. Commercial sodium fluoride, sodium silico fluoride and hydrofluosilicic acid which conform to the applicable American Water Works Association (AWWA) Standards, incorporated by reference into these rules at Subsection 002.01, are acceptable. Use of other chemicals shall be specifically approved by the Department. (3-30-07)

b. Fluoride compounds shall be stored in covered or unopened shipping containers. (3-30-07)

c. Provisions shall be made to minimize the quantity of fluoride dust. Empty bags, drums, or barrels shall be disposed of in a manner that will minimize exposure to fluoride dusts. (3-30-07)

d. Daily records of flow and amounts of fluoride added shall be kept. An analysis for fluoride in finished water shall be made at least weekly. Records of these analyses shall be kept by the supplier of water for five (5) years. (12-10-92)

06. Cross Connection Control Program - Community Water Systems. The water purveyor is responsible through its cross connection control program to take reasonable and prudent measures to protect the water system against contamination and pollution from cross connections through premises isolation, internal or in-plant isolation, fixture protection, or some combination of premises isolation, internal isolation, and fixture protection. Pursuant to Section 543, all suppliers of water for community water systems shall implement a cross connection control program to prevent the entrance to the system of materials known to be toxic or hazardous. The water purveyor is responsible to enforce the system's cross connection control program. The program will at a minimum include: (4-7-11)

a. An inspection program to locate cross connections and determine required suitable protection. For new connections, suitable protection must be installed prior to providing water service. (5-8-09)

b. Required installation and operation of adequate backflow prevention assemblies. Appropriate and adequate backflow prevention assembly types for various facilities, fixtures, equipment, and uses of water should be selected from the Pacific Northwest Cross Connection Control Manual, the Uniform Plumbing Code, the AWWA Recommended Practice for Backflow Prevention and Cross Connection Control (M14), the USC Foundation Manual of Cross Connection Control, or other sources deemed acceptable by the Department. The assemblies must meet the requirements of Section 543 and comply with local ordinances. (4-7-11)

c. Annual inspections and testing of all installed backflow prevention assemblies by a tester licensed by a licensing authority recognized by the Department. Testing shall be done in accordance with the test procedures published by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research. See the USC Foundation Manual of Cross-Connection Control referenced in Subsection 002.02. (4-7-11)

d. Discontinuance of service to any structure, facility, or premises where suitable backflow protection has not been provided for a cross connection. (4-7-11)

07. Cross Connection Control Program - Non-Community Water Systems. All suppliers of water for non-community water systems shall ensure that cross connections do not exist or are isolated from the potable

water system by an approved backflow prevention assembly. Backflow prevention assemblies shall be inspected and tested annually for functionality by an Idaho licensed tester, as specified in Subsection 552.06.c. (5-8-09)

553. CLASSIFICATION OF WATER SYSTEMS.

01. System Classification Required. The Department shall classify community, nontransient noncommunity, and surface water systems based on indicators of potential health risks. (4-6-05)

a. The owner or designee of every community and nontransient noncommunity public water system shall submit proof of the current conditions related to the classification of the system every five (5) years or more frequently if required by the Department. (4-6-05)

b. The owner or designee of all surface water systems shall submit proof of the current conditions related to the classification of the system every five (5) years or more frequently if required by the Department. (4-6-05)

02. Classification Criteria. Systems shall be classified under a system that uses the following criteria: (4-6-05)

a. Complexity, size, and type of source water for treatment facilities. (3-16-04)

b. Complexity and size of distribution systems. (4-5-00)

c. Other criteria deemed necessary to completely classify systems. (4-5-00)

d. The Department shall develop guidelines for applying the criteria set forth in Section 553. (3-16-04)

554. LICENSE REQUIREMENTS.

01. Licensed Operator Required. (4-6-05)

a. Owners of all community and nontransient noncommunity public drinking water systems must place the direct supervision of their drinking water system, including each treatment facility and distribution system, under the responsible charge of a properly licensed operator. (5-8-09)

b. Owners of all surface water systems must place the direct supervision of their public drinking water system under the responsible charge of a properly licensed operator. (4-6-05)

02. Responsible Charge Operator License Requirement. An operator in responsible charge of a public drinking water system must hold a valid license equal to or greater than the classification of the public water system where the responsible charge operator is in responsible charge. (4-6-05)

03. Substitute Responsible Charge Operator License Requirement. At such times as the responsible charge operator is not available, a substitute responsible charge operator shall be designated to replace the responsible charge operator. A substitute responsible charge operator of a public water system must hold a valid license equal to or greater than the classification of the public water system where the substitute responsible charge operator is in responsible charge. (4-6-05)

04. Shift Operator Requirement. Any public drinking water system subject to these requirements with multiple operating shifts must have a designated properly licensed operator available for each operating shift. An on-duty designated shift operator does not replace the requirements in Subsections 554.01 and 554.03 for responsible charge operator coverage during all operating shifts. (4-6-05)

05. Water Operator License Requirement. All operating personnel at public drinking water systems subject to these requirements making process control/ system integrity decisions about water quality or quantity that affect public health must hold a valid and current license. (4-6-05)

555. -- 559. (RESERVED)

560. CONTRACTING FOR SERVICES.
Public water systems may contract with persons to provide responsible charge operators and substitute responsible charge operators. Proof of such contract shall be submitted to the Department prior to the contracted person performing any services at the public water system. (4-6-05)

561. -- 562. (RESERVED)

563. ADVISORY GROUP.
Stakeholder Involvement. Ongoing stakeholder involvement will be provided through the existing drinking water advisory committee at the Department. (4-5-00)

564. -- 899. (RESERVED)

900. TABLES.

01. Table 1 -- Minimum Distances From a Public Water System Well.

Minimum Distances from a Public Water System Well	
Gravity wastewater line	50 feet
Any potential source of contamination	50 feet
Pressure wastewater line	100 feet
Class A Municipal Reclaimed Wastewater Pressure distribution line	50 feet
Individual home septic tank	100 feet
Individual home disposal field	100 feet
Individual home seepage pit	100 feet
Privies	100 feet
Livestock	50 feet
Drainfield - standard subsurface disposal module	100 feet
Absorption module - large soil absorption system	150 - 300 feet, see IDAPA 58.01.03
Canals, streams, ditches, lakes, ponds and tanks used to store non-potable substances	50 feet
Storm water facilities disposing storm water originating off the well lot	50 feet
Municipal or industrial wastewater treatment plant	500 feet
Reclamation and reuse of municipal and industrial wastewater sites	See IDAPA 58.01.17
Biosolids application site	1,000 feet

(4-7-11)

02. Table 2 - Well Casing Standards for Public Water System Wells.

STEEL PIPE					
				WEIGHT PER FOOT (pounds)	
DIAMETER (inches)			THICKNESS (inches)	Plain Ends	With Threads and Couplings
SIZE	External	Internal		(calculated)	(nominal)
6 (id) *	6.625	6.065	0.280	18.97	19.18
8	8.625	7.981	0.322	28.55	29.35
10	10.750	10.020	0.365	40.48	41.85
12	12.750	12.000	0.375	49.56	51.15
14 (od) *	14.000	13.250	0.375	54.57	57.00
16	16.000	15.250	0.375	62.58	
18	18.000	17.250	0.375	70.59	
20	20.000	19.250	0.375	78.60	
22	22.000	21.000	0.500	114.81	
24	24.000	23.000	0.500	125.49	
26	26.000	25.000	0.500	136.17	
28	28.000	27.000	0.500	146.85	
30	30.000	29.000	0.500	157.53	
32	32.000	31.000	0.500	168.21	
34	34.000	33.000	0.500	178.89	
36	36.000	35.000	0.500	189.57	

* id = inside diameter
od = outside diameter (3-30-07)

901. -- 999. (RESERVED)

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Appendix E-2

9th St. Well Source Water Assessment Summary Report

Source Water Assessment Summary Report: CLARK FORK CITY OF (PWS# ID1090018) 9TH STREET WELL E0005147

Introduction

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

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

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

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

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

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

This report was completed April 04, 2002. Potential contaminant information was updated on August 16, 2016.

What Was Assessed

This report evaluates CLARK FORK CITY OF (PWS# ID1090018) 9TH STREET WELL E0005147 located in BONNER county. The system serves approximately 570 people through 279 connections.

Defining the Source Water Assessment Area

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

For transient noncommunity water systems (TNCWS), which serve an average of at least 25 persons (but not the same 25) less than 6 months per year (e.g., campgrounds or highway rest stops that have their own water source), the delineation process involves mapping a fixed 1,000-foot radius around the wellhead.

To protect wellheads from bacteria and viruses, EPA recommends the source water assessment delineation be equal to at least 1-year TOT. TOT is the amount of time it takes a particle of water in the aquifer to reach the wellhead. A Minnesota study showed that a 1-year TOT zone for TNCWS wells completed in unconfined porous sediments is unlikely to exceed 155 feet in the upgradient direction. Therefore, to be conservative, a source water assessment delineation with a 1,000-foot radius was adopted in the Idaho Source Water Assessment Plan and is considered to be protective for transient, noncommunity wells.

The source water assessment for 9TH STREET WELL was done using the Fixed Radius and is illustrated in the map provided.

Susceptibility Analysis

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

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

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

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

Inorganic chemicals (IOC)

Volatile organic chemicals (VOC)

Synthetic organic chemicals (SOC)

Microbial contaminants

High susceptibility to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The susceptibility scores for 9TH STREET WELL are shown in the table below. Click here for full susceptibility score details.

Susceptibility Scores for CLARK FORK CITY OF (PWS# ID1090018) 9TH STREET WELL E0005147									
System Construction	Potential Contaminant Inventory / Land Use				Hydrologic Sensitivity	Final Susceptibility Ranking			
	IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
H	L	L	L	L	M	M	M	M	M
H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility. System Construction refers to the well, spring, or surface water intake.									
Auto High - see below.*			Report Date: 4/4/2002			Click for Map		Click for details	

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

System Construction Score

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

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

floodplain is the area likely to be inundated during a flood with a 1% chance of being equaled or exceeded in any given year. DEQ uses data from the Federal Emergency Management Agency to determine the 100-year floodplain for any given area.) Locating wells outside a floodplain can help prevent direct contact between the wellhead and storm, flood, or irrigation water.

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

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

Hydrologic Sensitivity Score

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

1. Composition of surface soil. Soil drainage classes (defined in soil surveys published by the NRCS in 1998), ranging from poorly drained to moderately drained, such as silt and clay, are deemed more protective of ground water than moderately to well drained soils, such as sand and gravel, which drain faster.
2. Material in the vadose zone (the zone between the land surface and first encountered water). Vadose zone materials comprised of gravel or fractured rock provide less protection from contamination than finer-grained sedimentary materials.
3. Depth at which ground water is first encountered. All other factors being equal, a greater depth to ground water provides greater opportunity for the attenuation of potential contaminants through adsorption and other mechanisms.
4. Presence of a low permeable unit (a layer of rock or sediment that does not transmit water easily, thus protecting the aquifer from contamination). For susceptibility scoring, DEQ considers a low permeable unit to be present if there is >50 feet of cumulative thickness of silt or clay-rich geologic materials, or fine grain sedimentary interbeds within basalt settings above the bottom of the annular seal to be protective of the aquifer.

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

Potential Contaminant Inventory/Land Use Scores

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

Stores, uses, or produces, as a product or by-product, the contaminants regulated under the federal Safe Drinking Water Act.

Has a potential for releasing the contaminants at levels that could potentially harm drinking water sources.

As part of each source water assessment, DEQ conducts an inventory of potential sources of contamination. The goal of the inventory is to locate and describe facilities, land uses, and environmental conditions that are potential sources of ground water contamination.

The inventory is a two-step process. First, DEQ identifies and documents potential contaminant sources in the source water assessment area using computer databases and GIS maps developed by DEQ and various state and federal agencies. Although DEQ uses the best information available, DEQ does not make any warranty regarding the accuracy or completeness of any information or data provided. For example, DEQ may not be able to obtain the exact location for each potential contaminant or may not be notified immediately of new sites or changes to existing sites. DEQ updates PCIs when new information warrants an update. The exact date inventories are updated is found in the PCI table. Second, the public water system receives a draft copy of the source water assessment and can provide comments to DEQ to correct or expand on the inventory. Although the public water system is only contacted by DEQ after the initial PCI is conducted, the public water system can review the PCI and submit corrections to DEQ at any time. Comments can be submitted to DEQ.

When agriculture is the predominant land use within the delineation, the likelihood of agricultural chemicals, such as fertilizers and pesticides, entering the ground water system may increase. This results in more points assessed for the IOC and SOC categories in the 0-3 year TOT zone. Additionally, depending on the percentage of agricultural land in each TOT, PCI/land use susceptibility scores may be influenced.

When the 0-3 year TOT zone intersects an area of defined ground water degradation, such as a nitrate priority area, additional points are assigned to the PCI/land use section of the susceptibility score. Nitrate is one of the most widespread ground water contaminants in Idaho. High levels of nitrate in drinking water are associated with adverse health effects. Therefore, DEQ designates areas with degraded ground water quality due to nitrate as nitrate priority areas with the goal of developing and implementing management strategies with local stakeholders to improve ground water quality.

Understanding Potential Contaminant Source Information

The presence of a potential source of contamination means that the potential for contamination exists due to the nature of the business, industry, or operation. A release is less likely to occur from a potential source of contamination, when the facility or landowner uses best management practices to manage the potential contaminant. Many potential sources of contamination are regulated at the federal or state level, or both, to reduce the risk of release. Therefore, when businesses, facilities, or properties are identified as potential contaminant sources, it does not mean that they are violating any local, state, or federal environmental law or regulation.

The table below lists the potential contaminants for 9TH STREET WELL public water system. The public water system is not located within a nitrate priority area.

PWS Name: CLARK FORK CITY OF (PWS# ID1090018)
Source Number: E0005147
Source Name: 9TH STREET WELL
Potential Contaminants:

Export to Excel

TOT *	Description of Potential Contaminant Source [1, 4]	Potential Contaminant(s)	Name	Data Source [2]	Updated Date [3]
0-3 year	Major And Minor Roads	IOC, VOC, SOC, Microbe	9Th Ave	GIS	3/15/2013
0-3 year	Surface Water	Site specific	Lightning Creek	GIS	3/15/2013
0-3 year	Mine Site	Site specific	Unnamed Location	GIS	8/16/2016

Footnotes:

1. The GIS datasets used to identify potential contaminants are gathered from various state and federal agencies and are updated on different intervals.
2. During the first phase of the PCI, known as the primary contaminant inventory, DEQ staff use GIS datasets and aerial photos to identify and document potential contaminant sources within the water system's source water assessment delineation. During the second phase of the PCI, known as the enhanced inventory, potential contaminants not already identified through GIS (e.g., septic systems, business sites, and land use activities) can be added to the PCI.
3. Date Updated refers to the most recent date each potential contaminant was last verified within the GIS datasets. PCIs are updated when new information warrants an update. Potential contaminants identified through aerial photos or enhanced inventories are updated less often.
4. Restriction of Liability for GIS Data: Neither the State of Idaho nor DEQ, nor any of their employees make any warranty, express or implied, or assume any legal liability or responsibility for the accuracy, completeness or usefulness of any information or data provided. Metadata are provided for all datasets, and no data should be used without first reading and understanding its limitations. The data could include technical inaccuracies or typographical errors. DEQ may update, modify, or revise the data used at any time, without notice.

* TOT = time of travel zone

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Refer to the susceptibility score details page for more information about the potential contaminants and land use within this delineation.

Conclusion

Local communities can use the information gathered through the assessment process to create a broader source water protection program to address current problems and prevent future threats to the quality of their drinking water supplies. Preventing contaminants from entering the public water system source can minimize health risks, expanded drinking water monitoring requirements, additional water treatment requirements, or expensive environmental cleanup activities. For assistance developing protection strategies, contact DEQ's Coeur D Alene Regional Office or the Idaho Rural Water Association. Also consider the following resources:

Idaho Source Water Protection Website

Idaho Source Water Protection Activities Guide

Idaho Source Water Protection Planning Tool

www.protectthesource.org

List of Acronyms and Abbreviations/Glossary

List of Acronyms and Abbreviated/Glossary

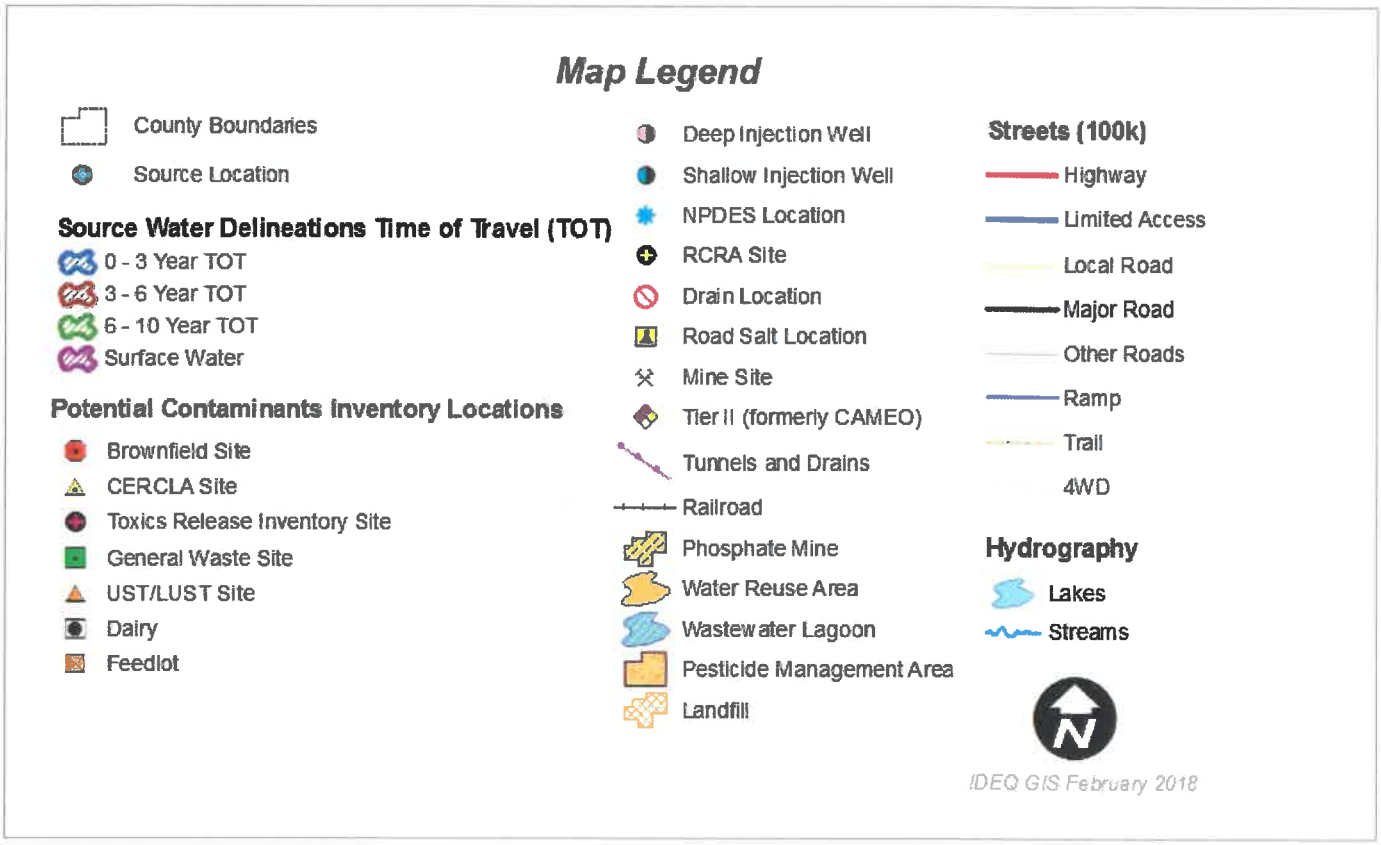
References

Map

The public water system is not located within a nitrate priority area.

Click here for dynamic map.
To save the map or legend right click on the images below and select save as.
(This map may take several seconds to load. We appreciate your patience.)





DEQ Intranet DEQ Website

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Appendix E-3

Spring Creek Well Source Water Assessment Summary Report

Source Water Assessment Summary Report: CLARK FORK CITY OF (PWS# ID1090018) SPRING CK WELL E0005148

Introduction

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

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

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

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

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

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

This report was completed April 04, 2002. Potential contaminant information was updated on August 16, 2016.

What Was Assessed

This report evaluates CLARK FORK CITY OF (PWS# ID1090018) SPRING CK WELL E0005148 located in BONNER county. The system serves approximately 570 people through 279 connections.

Defining the Source Water Assessment Area

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

For transient noncommunity water systems (TNCWS), which serve an average of at least 25 persons (but not the same 25) less than 6 months per year (e.g., campgrounds or highway rest stops that have their own water source), the delineation process involves mapping a fixed 1,000-foot radius around the wellhead.

To protect wellheads from bacteria and viruses, EPA recommends the source water assessment delineation be equal to at least 1-year TOT. TOT is the amount of time it takes a particle of water in the aquifer to reach the wellhead. A Minnesota study showed that a 1-year TOT zone for TNCWS wells completed in unconfined porous sediments is unlikely to exceed 155 feet in the upgradient direction. Therefore, to be conservative, a source water assessment delineation with a 1,000-foot radius was adopted in the Idaho Source Water Assessment Plan and is considered to be protective for transient, noncommunity wells.

The source water assessment for SPRING CK WELL was done using the Fixed Radius and is illustrated in the map provided.

Susceptibility Analysis

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

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

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

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

- Inorganic chemicals (IOC)
- Volatile organic chemicals (VOC)
- Synthetic organic chemicals (SOC)
- Microbial contaminants

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

Susceptibility Scores for CLARK FORK CITY OF (PWS# ID1090018) SPRING CK WELL E0005148									
System Construction	Potential Contaminant Inventory / Land Use				Hydrologic Sensitivity	Final Susceptibility Ranking			
	IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
H	L	L	L	L	M	M	M	M	M
H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility. System Construction refers to the well, spring, or surface water intake.									
Auto High - see below.*			Report Date: 4/4/2002			Click for Map		Click for details	

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

System Construction Score

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

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

floodplain is the area likely to be inundated during a flood with a 1% chance of being equaled or exceeded in any given year. DEQ uses data from the Federal Emergency Management Agency to determine the 100-year floodplain for any given area.) Locating wells outside a floodplain can help prevent direct contact between the wellhead and storm, flood, or irrigation water.

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

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

Hydrologic Sensitivity Score

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

1. Composition of surface soil. Soil drainage classes (defined in soil surveys published by the NRCS in 1998), ranging from poorly drained to moderately drained, such as silt and clay, are deemed more protective of ground water than moderately to well drained soils, such as sand and gravel, which drain faster.
2. Material in the vadose zone (the zone between the land surface and first encountered water). Vadose zone materials comprised of gravel or fractured rock provide less protection from contamination than finer-grained sedimentary materials.
3. Depth at which ground water is first encountered. All other factors being equal, a greater depth to ground water provides greater opportunity for the attenuation of potential contaminants through adsorption and other mechanisms.
4. Presence of a low permeable unit (a layer of rock or sediment that does not transmit water easily, thus protecting the aquifer from contamination). For susceptibility scoring, DEQ considers a low permeable unit to be present if there is >50 feet of cumulative thickness of silt or clay-rich geologic materials, or fine grain sedimentary interbeds within basalt settings above the bottom of the annular seal to be protective of the aquifer.

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

Potential Contaminant Inventory/Land Use Scores

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

Stores, uses, or produces, as a product or by-product, the contaminants regulated under the federal Safe Drinking Water Act.

Has a potential for releasing the contaminants at levels that could potentially harm drinking water sources.

As part of each source water assessment, DEQ conducts an inventory of potential sources of contamination. The goal of the inventory is to locate and describe facilities, land uses, and environmental conditions that are potential sources of ground water contamination.

The inventory is a two-step process. First, DEQ identifies and documents potential contaminant sources in the source water assessment area using computer databases and GIS maps developed by DEQ and various state and federal agencies. Although DEQ uses the best information available, DEQ does not make any warranty regarding the accuracy or completeness of any information or data provided. For example, DEQ may not be able to obtain the exact location for each potential contaminant or may not be notified immediately of new sites or changes to existing sites. DEQ updates PCIs when new information warrants an update. The exact date inventories are updated is found in the PCI table. Second, the public water system receives a draft copy of the source water assessment and can provide comments to DEQ to correct or expand on the inventory. Although the public water system is only contacted by DEQ after the initial PCI is conducted, the public water system can review the PCI and submit corrections to DEQ at any time. Comments can be submitted to DEQ.

When agriculture is the predominant land use within the delineation, the likelihood of agricultural chemicals, such as fertilizers and pesticides, entering the ground water system may increase. This results in more points assessed for the IOC and SOC categories in the 0-3 year TOT zone. Additionally, depending on the percentage of agricultural land in each TOT, PCI/land use susceptibility scores may be influenced.

When the 0-3 year TOT zone intersects an area of defined ground water degradation, such as a nitrate priority area, additional points are assigned to the PCI/land use section of the susceptibility score. Nitrate is one of the most widespread ground water contaminants in Idaho. High levels of nitrate in drinking water are associated with adverse health effects. Therefore, DEQ designates areas with degraded ground water quality due to nitrate as nitrate priority areas with the goal of developing and implementing management strategies with local stakeholders to improve ground water quality.

Understanding Potential Contaminant Source Information

The presence of a potential source of contamination means that the potential for contamination exists due to the nature of the business, industry, or operation. A release is less likely to occur from a potential source of contamination, when the facility or landowner uses best management practices to manage the potential contaminant. Many potential sources of contamination are regulated at the federal or state level, or both, to reduce the risk of release. Therefore, when businesses, facilities, or properties are identified as potential contaminant sources, it does not mean that they are violating any local, state, or federal environmental law or regulation.

The table below lists the potential contaminants for SPRING CK WELL public water system. The public water system is not located within a nitrate priority area.

PWS Name: CLARK FORK CITY OF (PWS# ID1090018)
Source Number: E0005148
Source Name: SPRING CK WELL
Potential Contaminants:

Export to Excel

TOT *	Description of Potential Contaminant Source [1, 4]	Potential Contaminant(s)	Name	Data Source [2]	Updated Date [3]
0-3 year	Major And Minor Roads				
0-3 year	Surface Water	Site specific	Spring Creek	GIS	3/15/2013

Footnotes:

1. The GIS datasets used to identify potential contaminants are gathered from various state and federal agencies and are updated on different intervals.
2. During the first phase of the PCI, known as the primary contaminant inventory, DEQ staff use GIS datasets and aerial photos to identify and document potential contaminant sources within the water system's source water assessment delineation. During the second phase of the PCI, known as the enhanced inventory, potential contaminants not already identified through GIS (e.g., septic systems, business sites, and land use activities) can be added to the PCI.
3. Date Updated refers to the most recent date each potential contaminant was last verified within the GIS datasets. PCIs are updated when new information warrants an update. Potential contaminants identified through aerial photos or enhanced inventories are updated less often.
4. Restriction of Liability for GIS Data: Neither the State of Idaho nor DEQ, nor any of their employees make any warranty, express or implied, or assume any legal liability or responsibility for the accuracy, completeness or usefulness of any information or data provided. Metadata are provided for all datasets, and no data should be used without first reading and understanding its limitations. The data could include technical inaccuracies or typographical errors. DEQ may update, modify, or revise the data used at any time, without notice.

* TOT = time of travel zone

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Refer to the susceptibility score details page for more information about the potential contaminants and land use within this delineation.

Conclusion

Local communities can use the information gathered through the assessment process to create a broader source water protection program to address current problems and prevent future threats to the quality of their drinking water supplies. Preventing contaminants from entering the public water system source can minimize health risks, expanded drinking water monitoring requirements, additional water treatment requirements, or expensive environmental cleanup activities. For assistance developing protection strategies, contact DEQ's Coeur D Alene Regional Office or the Idaho Rural Water Association. Also consider the following resources:

Idaho Source Water Protection Website

Idaho Source Water Protection Activities Guide

Idaho Source Water Protection Planning Tool

www.protectthesource.org

List of Acronyms and Abbreviations/Glossary

List of Acronyms and Abbreviated/Glossary

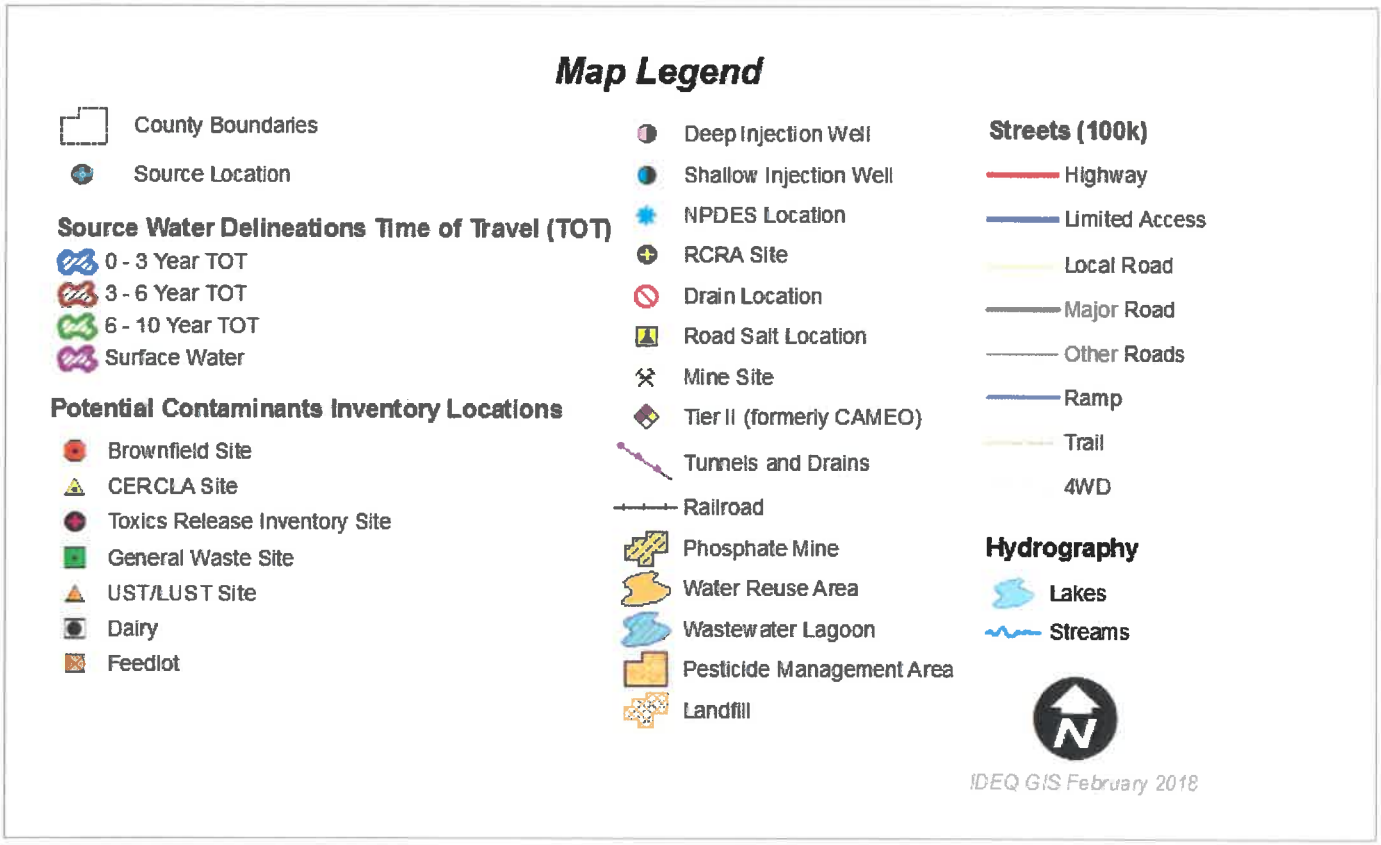
References

Map

The public water system is not located within a nitrate priority area.

Click here for dynamic map.
To save the map or legend right click on the images below and select save as.
(This map may take several seconds to load. We appreciate your patience.)





DEQ Intranet DEQ Website

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Appendix E-4

Water Quality Sampling Plan and Reports

Chemical And Radiological Sampling History

PWS Number: ID1090018
PWS Name: CLARK FORK CITY OF
Total Records: 37

A PWS is only required to report the most recent detections of any contaminant at each representative sampling location. For example, if nitrate is detected in a sample collected at Well X in 2016, but is not detected at Well X in 2017, then the system is not required to report nitrate for Well X in the 2017 CCR. **Note:** If a contaminant (e.g., nitrate) is listed with a "Y" (meaning "Yes") in the "non-detect" column, this means that sampling results showed a "non-detect" - that is to say, nitrate was not detected.

Required Language. If a system reports a detection, the system must give the major sources of the contaminant. To report this information, go to **Appendix A of the CCR template**, find the contaminant, and copy the information from the *"Major Sources in Drinking Water"* column and place it in your CCR. If the system exceeds the MCL (maximum contaminant level) value of a contaminant, the system must show the potential health effects of the contaminant. To report this information, go to **Appendix A of the CCR template** , find the contaminant, and copy the information from the *"Health Effects Language"* column and place it in your CCR.

Abbreviations used below:
MG/L (mg/L) = milligrams per liter (mg/L = ppm in Appendix A)
UG/L (µg/L) = micrograms per liter (µg/L = ppb in Appendix A)
PIC/L (pCi/L) = picocuries per liter

Contaminant	Date Collected	Facility	Non Detect?	Detected Level	Units	CCR Units
1,1,1-TRICHLOROETHANE	08/06/2013	SPRING CK WELL	Y	0.000		0.000
1,1,2-TRICHLOROETHANE	08/06/2013	SPRING CK WELL	Y	0.000		0.000
1,1-DICHLOROETHYLENE	08/06/2013	SPRING CK WELL	Y	0.000		0.000
1,2,4-TRICHLOROBENZENE	08/06/2013	SPRING CK WELL	Y	0.000		0.000
1,2-DICHLOROETHANE	08/06/2013	SPRING CK WELL	Y	0.000		0.000
1,2-DICHLOROPROPANE	08/06/2013	SPRING CK WELL	Y	0.000		0.000
BENZENE	08/06/2013	SPRING CK WELL	Y	0.000		0.000
CARBON TETRACHLORIDE	08/06/2013	SPRING CK WELL	Y	0.000		0.000
CHLOROBENZENE	08/06/2013	SPRING CK WELL	Y	0.000		0.000
CIS-1,2-DICHLOROETHYLENE	08/06/2013	SPRING CK WELL	Y	0.000		0.000
COMBINED RADIUM (-226 & -228)	08/06/2013	SPRING CK WELL	Y	0.000		0.000
COMBINED URANIUM	08/02/2016	SPRING CK WELL	Y	0.000		0.000
DICHLOROMETHANE	08/06/2013	SPRING CK WELL	Y	0.000		0.000
ETHYLBENZENE	08/06/2013	SPRING CK WELL	Y	0.000		0.000
GROSS ALPHA, EXCL. RADON & U	08/02/2016	SPRING CK WELL		0.020	PCI/L	0.020
GROSS ALPHA, INCL. RADON & U	08/02/2016	SPRING CK WELL	N	0.020	PCI/L	0.020
NITRATE	07/11/2017	9TH STREET WELL	Y	0.000		0.000
NITRATE	06/06/2017	SPRING CK WELL	Y	0.000		0.000
NITRATE	05/10/2016	9TH STREET WELL	Y	0.000		0.000
NITRATE	04/04/2016	SPRING CK WELL	Y	0.000		0.000
NITRATE	09/23/2015	9TH STREET WELL	Y	0.000		0.000
NITRATE	09/23/2015	SPRING CK WELL	Y	0.000		0.000
NITRATE	10/07/2014	SPRING CK WELL	Y	0.000		0.000
NITRATE	06/10/2014	9TH STREET WELL	Y	0.000		0.000
NITRATE	08/06/2013	9TH STREET WELL	Y	0.000		0.000
NITRATE	08/06/2013	SPRING CK WELL	Y	0.000		0.000
O-DICHLOROBENZENE	08/06/2013	SPRING CK WELL	Y	0.000		0.000
P-DICHLOROBENZENE	08/06/2013	SPRING CK WELL	Y	0.000		0.000
RADIUM-226	08/06/2013	SPRING CK WELL	Y	0.000		0.000
RADIUM-228	08/06/2013	SPRING CK WELL	Y	0.000		0.000
STYRENE	08/06/2013	SPRING CK WELL	Y	0.000		0.000
TETRACHLOROETHYLENE	08/06/2013	SPRING CK WELL	Y	0.000		0.000
TOLUENE	08/06/2013	SPRING CK WELL	Y	0.000		0.000
TRANS-1,2-DICHLOROETHYLENE	08/06/2013	SPRING CK WELL	Y	0.000		0.000
TRICHLOROETHYLENE	08/06/2013	SPRING CK WELL	Y	0.000		0.000
VINYL CHLORIDE	08/06/2013	SPRING CK WELL	Y	0.000		0.000
XYLENES, TOTAL	08/06/2013	SPRING CK WELL	Y	0.000		0.000

Note: Please notify your regional DEQ office if you find discrepancies in your sampling or violation histories. DEQ will correct the errors in the agency's database.

Coliform Sampling History

PWS Number: ID1090018
PWS Name: CLARK FORK CITY OF
Total Records: 12

Only report coliform results in the CCR if one or more samples tested positive during the 2017 calendar year.

Required Language. If your water system's coliform history for the year included one or more samples present for coliform, you must give the major sources of the contaminant. To report this information, go to **Appendix A of the CCR template**, find the contaminant, and copy the information from the *"Major Sources in Drinking Water"* column and place it in your CCR. If the system has exceeded the MCL (maximum contaminant level) value for coliforms, go to **Appendix A of the CCR template**, find the contaminant, and copy the information from the *"Health Effects Language"* column and place it in your CCR.

Contaminant	Date Collected	P=Present A=Absent
COLIFORM (TCR)	12/05/2017	A
COLIFORM (TCR)	11/21/2017	A
COLIFORM (TCR)	10/10/2017	A
COLIFORM (TCR)	09/12/2017	A
COLIFORM (TCR)	08/08/2017	A
COLIFORM (TCR)	07/11/2017	A
COLIFORM (TCR)	06/06/2017	A
COLIFORM (TCR)	05/09/2017	A
COLIFORM (TCR)	04/11/2017	A
COLIFORM (TCR)	03/14/2017	A
COLIFORM (TCR)	02/14/2017	A
COLIFORM (TCR)	01/17/2017	A

Note: Please notify your regional DEQ office if you find discrepancies in your sampling or violation histories. DEQ will correct the errors in the agency's database.

Lead And Copper Sampling History

PWS Number: ID1090018
PWS Name: CLARK FORK CITY OF
Total Records: 2

A public water system is only required to report the most recent 90% percentile detections for lead and copper within the past five years. If a result is listed as zero, it should be assumed the result was actually a non-detect.

Other lead and copper information to be included in the CCR not listed on this page are the number of samples collected from the distribution system, and the highest level of lead or copper that was detected.

Required Language. If there are detections for lead and copper to report, the system must give the major sources of the contaminant. If a system reports a detection, the system must give the major sources of the contaminant. To report this information, go to **Appendix A of the CCR template**, find the contaminant, and copy the information from the *"Major Sources in Drinking Water"* column and place it in your CCR. If the system exceeds the MCL (maximum contaminant level) value of a contaminant, the system must show the potential health effects of the contaminant. To report this information, go to **Appendix A of the CCR template**, find the contaminant, and copy the information from the *"Health Effects Language"* column and place it in your CCR.

Abbreviations used below:
MG/L (mg/L) = milligrams per liter (mg/L = ppm in Appendix A)
UG/L (µg/L) = micrograms per liter (µg/L = ppb in Appendix A)

Contaminant	# Samples Collected	90th %ile Result	Units	Date Collected	CCR Units
LEAD SUMMARY	5	0.006	MG/L	08/04/2015	6.000
COPPER SUMMARY	5	0.641	MG/L	08/04/2015	0.641

Note: Please notify your regional DEQ office if you find discrepancies in your sampling or violation histories. DEQ will correct the errors in the agency's database.

DBP Sampling History

PWS Number: ID1090018
PWS Name: CLARK FORK CITY OF
Total Records: 54

Sampling history is only listed for systems which are practicing chlorination on a full-time basis.

Public water systems that are required to collect one sample for disinfection byproducts once every year, or every three years, are only required to report the most recent detections for disinfection byproducts. If the most recent sampling was a non-detect for the contaminants, then it is not necessary to report any disinfection byproduct sampling. **Note:** If a contaminant is listed with a "Y" (meaning "Yes") in the "non-detect" column, this means that sampling results showed a "non-detect" - that is to say, the contaminant was not detected.

If a public water system collects more than one sample per year, the system must report the average of Total Trihalomethanes and Haloacetic Acids Group 5 over the 2017 calendar year. The highest level detected, and the range for each contaminant must also be reported.

Required Language. If a system reports a detection, the system must give the major sources of the contaminant. To report this information, go to **Appendix A of the CCR template**, find the contaminant, and copy the information from the *"Major Sources in Drinking Water"* column and place it in your CCR. If the system has exceeded the MCL (maximum contaminant level) value of a contaminant, go to **Appendix A of the CCR template**, find the contaminant, and copy the information from the *"Health Effects Language"* column and place it in your CCR.

Contaminant	Date Collected	Sampling Location	Non Detect?	Detected Level	Units	CCR Units
TOTAL HALOACETIC ACIDS (HAA5)	07/25/2017	101 STEPHENS	N	23.500	UG/L	23.500
TOTAL HALOACETIC ACIDS (HAA5)	08/02/2016	101 STEPHENS	N	1.160	UG/L	1.160
TOTAL HALOACETIC ACIDS (HAA5)	09/23/2015	101 STEPHENS	Y	0.000		0.000
TOTAL HALOACETIC ACIDS (HAA5)	06/02/2015	101 STEPHENS	N	1.090	UG/L	1.090
TOTAL HALOACETIC ACIDS (HAA5)	10/07/2014	101 STEPHENS	Y	0.000		0.000
TOTAL HALOACETIC ACIDS (HAA5)	10/07/2014	904 CEDAR	Y	0.000		0.000
TOTAL HALOACETIC ACIDS (HAA5)	08/05/2014	904 CEDAR	Y	0.000		0.000
TOTAL HALOACETIC ACIDS (HAA5)	08/05/2014	101 STEPHENS	N	1.420	UG/L	1.420
TOTAL HALOACETIC ACIDS (HAA5)	05/06/2014	904 CEDAR	Y	0.000		0.000
TOTAL HALOACETIC ACIDS (HAA5)	05/06/2014	101 STEPHENS	N	1.050	UG/L	1.050
TOTAL HALOACETIC ACIDS (HAA5)	02/11/2014	101 STEPHENS	Y	0.000		0.000
TOTAL HALOACETIC ACIDS (HAA5)	02/11/2014	904 CEDAR	Y	0.000		0.000
TOTAL HALOACETIC ACIDS (HAA5)	12/10/2013	904 CEDAR	Y	0.000		0.000
TOTAL HALOACETIC ACIDS (HAA5)	12/10/2013	101 STEPHENS	Y	0.000		0.000
TOTAL HALOACETIC ACIDS (HAA5)	08/06/2013	GENERIC SAMPLING PT	Y	0.000		0.000
TOTAL HALOACETIC ACIDS (HAA5)	08/06/2013	GENERIC SAMPLING PT	Y	0.000		0.000
TOTAL HALOACETIC ACIDS (HAA5)	10/13/2009	GENERIC SAMPLING PT	Y	0.000		0.000
TOTAL HALOACETIC ACIDS (HAA5)	10/13/2009	GENERIC SAMPLING PT	N	0.002	MG/L	2.000
TOTAL HALOACETIC ACIDS (HAA5)	07/14/2009	GENERIC SAMPLING PT	Y	0.000		0.000
TOTAL HALOACETIC ACIDS (HAA5)	07/14/2009	GENERIC SAMPLING PT	Y	0.000		0.000
TOTAL HALOACETIC ACIDS (HAA5)	04/17/2009	GENERIC SAMPLING PT	N	0.001	MG/L	1.000
TOTAL HALOACETIC ACIDS (HAA5)	04/17/2009	GENERIC SAMPLING PT	Y	0.000		0.000
TOTAL HALOACETIC ACIDS (HAA5)	01/14/2009	GENERIC SAMPLING PT	Y	0.000	MG/L	0.000
TOTAL HALOACETIC ACIDS (HAA5)	01/14/2009	GENERIC SAMPLING PT	Y	0.000	MG/L	0.000
TOTAL HALOACETIC ACIDS (HAA5)	07/17/2008	GENERIC SAMPLING PT	Y	0.000	MG/L	0.000
TOTAL HALOACETIC ACIDS (HAA5)	07/17/2008	GENERIC SAMPLING PT	Y	0.000	MG/L	0.000
TOTAL HALOACETIC ACIDS (HAA5)	08/20/2004	GENERIC SAMPLING PT	Y	0.000	MG/L	0.000
TTHM	07/25/2017	101 STEPHENS	N	0.940	UG/L	0.940
TTHM	08/02/2016	101 STEPHENS	N	1.400	UG/L	1.400
TTHM	09/23/2015	101 STEPHENS	Y	0.000		0.000
TTHM	06/02/2015	101 STEPHENS	N	2.920	UG/L	2.920
TTHM	10/07/2014	101 STEPHENS	N	1.900	UG/L	1.900
TTHM	10/07/2014	904 CEDAR	N	0.420	UG/L	0.420
TTHM	08/05/2014	904 CEDAR	N	0.430	UG/L	0.430
TTHM	08/05/2014	101 STEPHENS	N	1.070	UG/L	1.070
TTHM	05/06/2014	904 CEDAR	N	0.930	UG/L	0.930
TTHM	05/06/2014	101 STEPHENS	N	1.660	UG/L	1.660
TTHM	02/11/2014	101 STEPHENS	N	0.760	UG/L	0.760

TTHM	02/11/2014	904 CEDAR	Y	0.000		0.000
TTHM	12/10/2013	904 CEDAR	N	0.660	UG/L	0.660
TTHM	12/10/2013	101 STEPHENS	N	0.780	UG/L	0.780
TTHM	08/06/2013	GENERIC SAMPLING PT	N	1.540	UG/L	1.540
TTHM	08/06/2013	GENERIC SAMPLING PT	N	1.190	UG/L	1.190
TTHM	10/13/2009	GENERIC SAMPLING PT	N	0.001	MG/L	1.400
TTHM	10/13/2009	GENERIC SAMPLING PT	N	0.002	MG/L	1.600
TTHM	07/14/2009	GENERIC SAMPLING PT	N	0.001	MG/L	0.900
TTHM	07/14/2009	GENERIC SAMPLING PT	N	0.002	MG/L	2.100
TTHM	04/17/2009	GENERIC SAMPLING PT	N	0.001	MG/L	0.900
TTHM	04/17/2009	GENERIC SAMPLING PT	N	0.002	MG/L	2.200
TTHM	01/14/2009	GENERIC SAMPLING PT	N	0.001	MG/L	1.400
TTHM	01/14/2009	GENERIC SAMPLING PT	N	0.001	MG/L	1.000
TTHM	07/17/2008	GENERIC SAMPLING PT	N	0.001	MG/L	1.400
TTHM	07/17/2008	GENERIC SAMPLING PT	N	0.001	MG/L	1.300
TTHM	08/20/2004	GENERIC SAMPLING PT	N	0.004	MG/L	4.100

Note: Please notify your regional DEQ office if you find discrepancies in your sampling or violation histories. DEQ will correct the errors in the agency's database.

RTCR Sampling History

PWS Number: ID1090018
PWS Name: CLARK FORK CITY OF
Total Records: 0

Only report if your water system was required to comply with one or more Revised Total Coliform Rule (RTCR) Level 1 and/or Level 2 Assessments during the 2017 calendar year.

Required Language: If your water system was required to conduct an RTCR Level 1 or Level 2 Assessment (numbers I-III below), the associated information must be reported in the CCR in accordance with IDAPA 58.01.08.151.

I. If your water system was required to conduct a Level 1 or 2 assessment **not** due to an *E. coli* MCL violation, go to section I below.
II. If your water system was required to conduct a Level 2 assessment **due** to an *E. coli* MCL violation, go to section II below.
III. If your water system detected *E. coli* and **did not** violate the *E. coli* MCL, go to section III below.

I. If your water system was required to conduct a Level 1 or 2 assessment not due to an *E.coli* MCL violation, you must include in the report adverse health affect information and additional information regarding the number of assessments required, the number of assessments completed, the number of corrective actions required and the number of corrective actions completed.

(A) Adverse Health Effects Required Text: Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. We found coliforms indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessment(s) to identify problems and to correct any problems that were found during these assessments.

(B) Additional Information Required:

a. During the past year we were required to conduct [INSERT NUMBER OF LEVEL 1 ASSESSMENTS] Level 1 assessment(s). [INSERT NUMBER OF LEVEL 1 ASSESSMENTS] Level 1 assessment(s) were completed. In addition, we were required to take [INSERT NUMBER OF CORRECTIVE ACTIONS] corrective actions and we completed [INSERT NUMBER OF CORRECTIVE ACTIONS] of these actions.

b. During the past year [INSERT NUMBER OF LEVEL 2 ASSESSMENTS] Level 2 assessments were required to be completed for our water system. [INSERT NUMBER OF LEVEL 2 ASSESSMENTS] Level 2 assessments were completed. In addition, we were required to take [INSERT NUMBER OF CORRECTIVE ACTIONS] corrective actions and we completed [INSERT NUMBER OF CORRECTIVE ACTIONS] of these actions.

c. Any system that has failed to complete all the required assessments or correct all identified sanitary defects, is in violation of the treatment technique requirement and must also include one or both of the following statements, as appropriate:

i. During the past year we failed to conduct all of the required assessment(s).

ii. During the past year we failed to correct all identified defects that were found during the assessment.

II. If your water system was required to conduct a Level 2 assessment due to an *E.coli* MCL violation, you must include in the report adverse health affect information and additional information regarding the number of assessments required, the number of assessments completed, the number of corrective actions required and the number of corrective actions completed.

(A) Adverse Health Effects Required Text: *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems. We found *E. coli* bacteria, indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessment(s) to identify problems and to correct any problems that were found during these assessments.

(B) Additional Information Required:

a. We were required to complete a Level 2 assessment because we found *E. coli* in our water system. In addition, we were required to take [INSERT NUMBER OF CORRECTIVE ACTIONS] corrective actions and we completed [INSERT NUMBER OF CORRECTIVE ACTIONS] of these actions.

b. Any system that has failed to complete the required assessment or correct all identified sanitary defects, is in violation of the treatment technique requirement and must also include one or both of the following statements, as appropriate:

i. We failed to conduct the required assessment.

ii. We failed to correct all sanitary defects that were identified during the assessment that we conducted.

c. Any system that violated the *E. coli* MCL, the system must include, in addition to the required adverse health effects text [see II.(A) above], one or more of the following statements to describe any noncompliance, as applicable:

i. We had an *E. coli*-positive repeat sample following a total coliform-positive routine sample.

ii. We had a total coliform-positive repeat sample following an *E. coli*-positive routine sample.

iii. We failed to take all required repeat samples following an *E. coli*-positive routine sample.

iv. We failed to test for *E. coli* when any repeat sample tests positive for total coliform.

III. If your water system detected *E. coli* and did not violate the *E. coli* MCL, the system may include, in addition to the required adverse health effects text [See II.(A) above], a statement that explains that although *E. coli* water detected, your system was not in violation of the *E. coli* MCL.

No results were found for the RTCR Sampling History Report.

Note: Please notify your regional DEQ office if you find discrepancies in your sampling or violation histories. DEQ will correct the errors in the agency's database.

Chlorine Maximum Residual Disinfectant Level Sampling History

PWS Number: ID1090018
PWS Name: CLARK FORK CITY OF
Total Records: 12

Sampling history is only listed for systems which are practicing chlorination on a full-time basis.

Please include in your CCR the highest chlorine residual level detected during the previous calendar year (2017) by your system, as well as the average of all residuals collected during 2017.

Required Language. If the system exceeds the chlorine MCL (maximum contaminant level) value, the system must show the potential health effects of the contaminant. To report this information, go to **Appendix A of the CCR template**, find the contaminant, and copy the information from the *"Health Effects Language"* column and place it in your CCR.

Samples Collected	Chlorine Residual	Units	Begin Date	Monitoring Period
1	0.3000	MG/L	01/01/2017	JAN2017
1	0.4800	MG/L	02/01/2017	FEB2017
1	0.5900	MG/L	03/01/2017	MAR2017
1	0.5100	MG/L	04/01/2017	APR2017
1	0.3900	MG/L	05/01/2017	MAY2017
1	0.5000	MG/L	06/01/2017	JUN2017
1	0.6600	MG/L	07/01/2017	JUL2017
1	0.4600	MG/L	08/01/2017	AUG2017
1	0.5500	MG/L	09/01/2017	SEP2017
1	0.3000	MG/L	10/01/2017	OCT2017
1	0.6100	MG/L	11/01/2017	NOV2017
1	0.5300	MG/L	12/01/2017	DEC2017

Note: Please notify your regional DEQ office if you find discrepancies in your sampling or violation histories. DEQ will correct the errors in the agency's database.

Due Monthly

COLIFORM BACTERA ANALYSIS REPORT

Containment ID#3100
for Public Drinking Water

Select Site:

1. Turn on water and run for 4 minutes or until water is clear
2. Turn off water and remove faucet screen
3. Disinfect with bleach and wipe off with clean paper towel.
4. Turn water on and run for a few minutes
5. Open sample bottle and fill between lines
6. Replace cap and fill out information on bottle
7. Take Chlorine Residual Sample – Record P. H. sample and water temperature on attached form

INSTRUCTIONS AND EXPLANATION

Coliform

COLLECTING THE SAMPLE

1. Select a clean faucet. Avoid collecting from a swivel or hinged faucet as bacteria regrowth may occur in the cracks.
2. Remove all screens or strainers before taking the sample.
3. Allow water to run for five minutes before taking the sample.
4. DO NOT REMOVE the cap from the bottle until just before taking the sample. While you are filling the bottle, hold on to the cap so that neither the lip of the bottle or the inside surface of the cap touch anything, expecially your fingers. FILL THE BOTTLE ¾ FULL.
5. Coliform samples must reach the laboratory within 30 hours. Samples older than 30 hours will not be tested in other than exceptional cases and a new sample must be taken.
6. HPC samples must reach the laboratory within 8 hours of collection. Samples older than 8 hours will not be tested in other than exceptional cases.
7. If possible, keep the sample refrigerated or on ice until you turn it over to the lab.
8. Clearly label the bottle with the sampling location and date. Use wax pencil or tape and permanent pen.

FILLING OUT THE FORM

NOTE: If this form is not filled out completely, the sample will not be analyzed, and public water systems will not be given credit for the sample.

1. **PWS ID No.** – Public water systems **only** must fill in their identification number. Call the Division of Environmental Quality Regional Office if you do not know your ID number.
2. **Sample Type Code** – From the choices on the front, fill in the sample type that applies. Be sure to use the code for REPEAT SAMPLES corresponding to where the sample is collected.
3. **Sampling location** – Indicate specifically where the sample was collected, for example: kitchen tap; 8400 Hill Road.
4. **Time collected** – Use military time (24-hour clock) or include a.m. or p.m.
5. **Chlorine residual** – If measured, mark chlorine residual in mg/l, and whether free or total.
6. **Original Sample Date** – For PWS only, if this is a repeat sample, mark the date of the ORIGINAL POSITIVE SAMPLE.
7. **Analysis Requested**

- If you do not want a total coliform analysis, specify under Remarks which of the following tests to perform:

  EC = E. coli FC = fecal coliform HPC = heterotrophic plate count

- If you want total coliform **density** rather than Presence/Absence, please indicate so under Remarks.

EXPLANATION OF TEST RESULTS

P = bacteria present in the sample
A = bacteria absent from the sample
#/100 ml = number of bacteria per 100 milliliters of sample

Total coliforms – if these are present, your sample is CONTAMINATED, and may contain disease causing organisms.

Fecal coliforms – if these are present, your sample contains FECAL CONTAMINATION, and is likely to contain disease causing organisms.

E. coli – if these are present, your sample contains RECENT HUMAN FECAL CONTAMINATION and is very likely to contain disease causing organisms.

HPC – counts greater than 500/ml indicate CONTAMINATION, and may interfere with coliform analysis.

For futher explanation of these results and corrective actions, please contact your District Health Department or Division of Environmental Quality.

ANALYTICAL METHODS

Total coliforms

WMF	Membrane Filter Technique. Parts 909 and 909A, Standard Methods..., 16th ed., 1985.
WMTF	Multiple Tube Fermentation. Parts 908, 908A, and 908B, Standard Methods..., 16th ed., 1985.
WPA	Presence Absence. Part 908E, Standard Methods..., 16th ed., 1985.
WMMO	MMO-MUG Test. Per 40 CFR 141.21(f)(iv) and 141.21 (f)(7).

Fecal coliforms

WEC	EC. Part 908C, Standard Methods..., 16th ed., 1985.

E. coli

WECM	EC-MUG. Federal Register, 56 FR 639, January 8, 1991.
WNAM	Nutrient Agar-MUG. Federal Register, 56 FR 639, January 8, 1991.

HPC

WHPC	Pour Plate. Part 907A (R2A agar), Standard Methods..., 16th ed., 1985.
HPCB	Spread Plate. Part 907B, Standard Methods..., 16th ed., 1985.

DEQ Public Drinking Water System
Monitoring Schedule Report
Print Date: March 17, 2017

ID1090018 - CLARK FORK CITY OF

Community water system serving 570 people and 276 connections.
Regulated by COEUR D ALENE REGIONAL OFFICE.

The following schedules include monitoring periods between 1/1/2017 and 12/31/2019.

Schedules for Distribution System(s)

Code	Group/Analyte Name	Monitoring Frequency	Season Begin Date	Season End Date	Satisfied
3100	COLIFORM (TCR)	1 per MN	1/1	12/31	Monthly
PBCU	LCR - LEAD COPPER	10 per 3Y in 2018 taken 6/1 through 9/30	6/1	9/30	*FUTURE
2456	TOTAL HALOACETIC ACID (HAA5)	1 per YR collected in 2017 taken 7/1 through 9/30 101 STEPHENS (DBP2A)	7/1	9/30	~~NO~~ yes
2950	TTHM	1 per YR collected in 2017 taken 7/1 through 9/30 101 STEPHENS (DBP2A)	7/1	9/30	~~NO~~ yes
2456	TOTAL HALOACETIC ACID (HAA5)	1 per YR collected in 2018 taken 7/1 through 9/30 101 STEPHENS (DBP2A)	7/1	9/30	*FUTURE
2950	TTHM	1 per YR collected in 2018 taken 7/1 through 9/30 101 STEPHENS (DBP2A)	7/1	9/30	*FUTURE
2456	TOTAL HALOACETIC ACID (HAA5)	1 per YR collected in 2019 taken 7/1 through 9/30 101 STEPHENS (DBP2A)	7/1	9/30	*FUTURE
2950	TTHM	1 per YR collected in 2019 taken 7/1 through 9/30 101 STEPHENS (DBP2A)	7/1	9/30	*FUTURE

Schedules for Distribution System(s) - Lead and Copper

Code	Group/Analyte Name	Monitoring Frequency	Season Begin Date	Season End Date	Satisfied
PBCU	LCR - LEAD COPPER	10 per 3Y in 2018 taken 6/1 through 9/30	6/1	9/30	*FUTURE

Note: Consumer notice of lead tap results, regardless of lead level, is required within 30 days after receiving results.For templates and more information, please visit: http://www.deq.idaho.gov/water-quality/drinking-water/pws-monitoring-reporting/public-notifications

Schedules for 9TH STREET WELL, Tag # E0005147

Please label these samples as '9TH STREET WELL'

Code	Group/Analyte Name	Monitoring Frequency	Season Begin Date	Season End Date	Satisfied
ZNO2	NITRITE	1 per 9Y due between 01/01/2011 and 12/31/2019	n/a	n/a	YES
ZNO3	NITRATE	1 per YR due between 01/01/2017 and 12/31/2017	n/a	n/a	~~NO~~ - 7/11/17
ZNO3	NITRATE	1 per YR due between 01/01/2018 and 12/31/2018	n/a	n/a	*FUTURE

"*FUTURE" in the "Satisfied" column indicates the sampling requirement begins sometime in the future. Sampling before the monitoring period begin date will not satisfy the requirement for the monitoring period.

"*See CO" in the "Satisfied" column indicates the operator needs to contact his or her compliance officer (CO) to verify that samples have been taken and the schedule has been satisfied.

ZNO3	NITRATE	1 per YR due between 01/01/2019 and 12/31/2019	n/a	n/a	*FUTURE

Schedules for SPRING CK WELL, Tag # E0005148

Please label these samples as 'SPRING CK WELL'

Code	Group/Analyte Name	Monitoring Frequency	Season Begin Date	Season End Date	Satisfied
SODI	IOC - SODIUM	1 per 3Y due between 01/01/2017 and 12/31/2019	n/a	n/a	NO
VOCS	VOCS - GROUP	1 per 6Y due between 01/01/2014 and 12/31/2019	n/a	n/a	NO
ZARS	ARSENIC (1005)	1 per 9Y due between 01/01/2011 and 12/31/2019	n/a	n/a	NO
ZFLU	IOC - FLUORIDE	1 per 9Y due between 01/01/2011 and 12/31/2019	n/a	n/a	NO
ZIOC	IOCS - PHASE 2 AND 5	1 per 9Y due between 01/01/2011 and 12/31/2019	n/a	n/a	NO
ZNO2	NITRITE	1 per 9Y due between 01/01/2011 and 12/31/2019	n/a	n/a	YES
ZNO3	NITRATE	1 per YR due between 01/01/2017 and 12/31/2017	n/a	n/a	~~NO~~ – Yes
ZNO3	NITRATE	1 per YR due between 01/01/2018 and 12/31/2018	n/a	n/a	*FUTURE
ZNO3	NITRATE	1 per YR due between 01/01/2019 and 12/31/2019	n/a	n/a	*FUTURE

IMPORTANT NOTICE: This monitoring schedule is provided to you as a courtesy and is current as of **March 17, 2017**. Surface water systems and systems that are disinfecting have additional sampling that is not reflected in this monitoring schedule report. This monitoring schedule may be changed or modified as needed. Please revisit the monitoring schedule tool and review the system's monitoring schedule prior to sampling to ensure compliance with the most current monitoring requirements. Contact your public water system regulating agency if you have any questions.

"*FUTURE" in the "Satisfied" column indicates the sampling requirement begins sometime in the future. Sampling before the monitoring period begin date will not satisfy the requirement for the monitoring period.

"*See CO" in the "Satisfied" column indicates the operator needs to contact his or her compliance officer (CO) to verify that samples have been taken and the schedule has been satisfied.

Appendix E-5

September 2013 Sanitary Survey Report

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

2110 Ironwood Parkway, Coeur d'Alene, ID 83814 (208) 769-1422

C. L. "Butch" Otter, Governor
Curt A. Fransen, Director

September 5, 2013

Mr. Bill Harp, Operator
City of Clark Fork
PO Box 10
Clark Fork, ID 83811

Re: Sanitary Survey for City of Clark Fork ID1090018

Dear Mr. Harp:

Thank you for your assistance in conducting the inspection of the City of Clark Fork water system on August 6, 2013. We found that the water system was well built, properly maintained, and in compliance with the Idaho Rules for Public Drinking Water Systems. It will continue with its approved designation.

The deficiencies and recommendations listed below need to be addressed in a written Plan of Correction (POC) and submitted to DEQ within 30 days of the receipt of this letter. The POC is a simple narrative document that lists the deficiencies and additional requirements, how they will be corrected, and the date by which correction will be completed.

Deficiencies and Requirements

1. The water system must ensure that cross connections do not exist or are isolated from the potable water system by an approved backflow prevention assembly. Backflow prevention assemblies shall be inspected and tested annually for functionality by an Idaho licensed tester, as specified in Subsection 552.06.c. Annual backflow testing of all backflow assemblies installed on underground sprinkler systems within distribution is required.
2. Please complete the enclosed Financial and Managerial Capacity forms and return to the Department along with your plan of corrections.
3. It is required that any dead end distribution mains must be flushed every six months.

Follow up Items

1. If at any time there is a depressurization event, the District must provide public notification and also notify the DEQ.

Recommendations:

1. The Department strongly recommends that the City of Clark Fork develop a plan for financing the needed repairs and upgrades to their water system. It was discussed that the 4-inch lines on all fire hydrants be replaced with 6-inch lines to correct the problem of low fire

flows; replace deteriorating lines/mains to 6-inch lines with the priority on locating and replacing the leaking lines; repair and replace valves in distribution system; repair and add an additional reservoir; change the corrosion control chemical to sodium bicarbonate (soda ash) which is much safer to work with than the current 25% sodium hydroxide (caustic soda) solution.

2. The Department recommends that an additional eye wash station be added in the chemical room at the Spring Creek well house. (Dow E)
3. The Department recommends the reservoir be inspected and cleaned every five years.
4. The Department recommends the valves in distribution be exercised annually.
5. The Department recommends an operation and maintenance manual be provided for the drinking water system. Operation and maintenance manuals should include daily operating instructions, trouble shooting, operator safety procedures, location of valves and other key system features, parts lists and parts order forms, and information for contacting the water system operator.

If you have any questions regarding this survey, please do not hesitate to contact me at the DEQ office in Coeur d'Alene. We are located at 2110 Ironwood Parkway; my phone number is 208.666.4630.

Sincerely,

Jean Felker

Jean Felker
Drinking Water Analyst
Jean.felker@deq.idaho.gov

Enclosures
File in TRIM: ID1090018 City of Clark Fork

IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY

Drinking Water Supply Report

County: **Bonner** PWS #: **1090018** Date: **August 06, 2013**
System: **City of Clark Fork**
System Representative: **William Harp**
Surveyed by: **Jean Felker & Suzanne Scheidt**
Source**: Wells** GWUDI Analysis: **Groundwater (3/12/2001)**
Population/Connections: **570/276** Water System Type: **Community**

History
The City of Clark Fork is a small town located on the Clark Fork River about 8 miles west of the Idaho-Montana state line. The water supply system consists of two wells (one active), corrosion control system, disinfection system, transmission line, reservoir, and looped distribution system. The water system serves approximately 570 people through 276 connections.

Source
There are two sources of water for the City of Clark Fork, the Spring Creek Well and the 9th Street Well (formerly known as the Town Well). The Spring Creek Well is the sole source of water for the city. The Ninth Street well is not actively serving the water system and does not have any means of treatment for corrosion control or to provide disinfection.

The Spring Creek well is located inside the pump house. The 16-inch diameter casing has an approved well head seal, and is properly vented. It is 70 feet deep with a stainless steel well screen on the lower 10 feet of the casing. The pump is a 15 HP Berkley submersible.

The well produces approximately 350 GPM. The well is controlled by a variable speed controller to minimize water hammer during start up. The well can be pumped to waste and discharges outside the pump house. The discharge is screened.

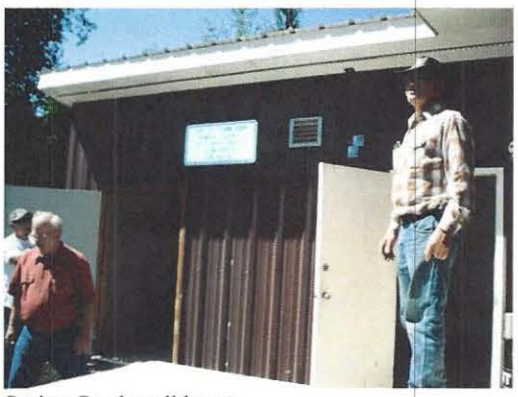
There is an air relief valve located on the discharge pipe which serves to release air when the pump is activated and allows air to re-enter the column, if necessary, when the pumping cycle is over. The air relief valve discharges to the atmosphere outside of the pump house wall through a screened 2-inch galvanized pipe.

Also located on the discharge pipe is an 8-inch flow meter, a gate valve, a check valve, sample taps, a pressure gauge, a flow measurement detector that activates the chlorinator and corrosion control systems and the injectors for both sodium hypochlorite (liquid chlorine) and caustic soda 25%.

There is backup power for the well located in the pump house – a 30 KW Stafford Generator powered by a 4-cylinder diesel motor. This generator was installed in 1996. The fuel is stored in a 100-gallon heavy gauge steel tank located under the generator. There was no evidence of oil leakage either from the tank or the motor. The operator stated that the fuel tank was double walled.

The pump house and treatment rooms are both heated by in-floor liquid heating coils. The facility was securely locked and appears to provide adequate heat, ventilation and lighting.

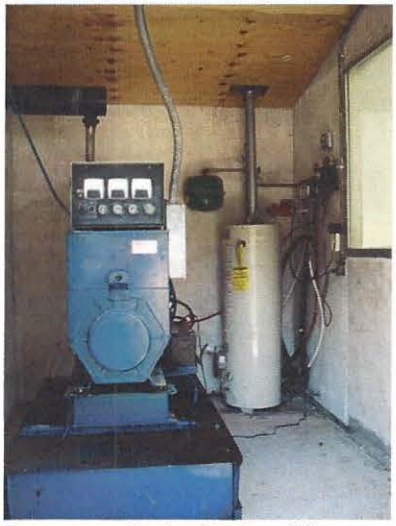
There do not appear to be any points of contamination located near the well. A small dam, the impoundment behind it, and Spring Creek flowing into the impoundment would seem to indicate a threat of influence by surface water but two microscopic particle analyses in 1994 indicated that influence was negative and that the source was actually groundwater.



Spring Creek well house



Spring Creek Well



Generator at Spring Creek well house



injection point of chlorine & caustic soda 25%

The secondary (offline) source of water for the city is known as the 9th Street Well. It is located east of Spring Creek at the end of 9th street on property owned by the Idaho Department of Transportation. The well has a 10-inch casing that is reduced to 8-inch about 12 feet under the surface of the ground. It has a satisfactory well head seal and the vent is properly screened.

The pump is a 30 HP Berkley submersible that discharges through a pitless adapter to a flow meter (located in a vault next to the well) and then directly into the distribution system. A sample tap is located in the vault. There do not appear to be any points of contamination near the well head. The well will provide 250 GPM but is not used except for emergencies because there is no disinfection or corrosion control treatment available. The well can be pumped to waste via a fire hydrant that is located next to the vault and is flushed monthly.



9th Street pump house



Inside pump house



9th Street well head



flushing 9th Street well

Treatment

There are two water treatments—disinfection and corrosion control - applied to the well water produced by the Spring Creek Well. A sodium hypochlorite injection system provides the disinfection. The flow-sensing device on the 8-inch well discharge line in the pump house activates this system. The system is flow proportional and cannot inject solution unless the sensor detects flow from the wells and has an automatic cutoff in the event the wells stop producing water. When the well pump is activated, water flows through a control valve at a rate of 5 GPM. The free chlorine residual is recorded daily. The chlorine solution holding tank was properly vented to the outside to avoid excessive corrosion of the interior of the well house equipment.

The second treatment that occurs at the pump house is a sodium hydroxide injection for corrosion control. Univar provides a 25% sodium hydroxide solution in a 50-gallon plastic drum. This drum and an LMI chemical feed pump are located in a separate room of the pump house. When the flow sensor on the well discharge line senses water flowing, the LMI pump begins to inject sodium hydroxide into the water. Water quality parameter testing occurs on a daily basis at the pump house and at city hall to determine if the system is working.

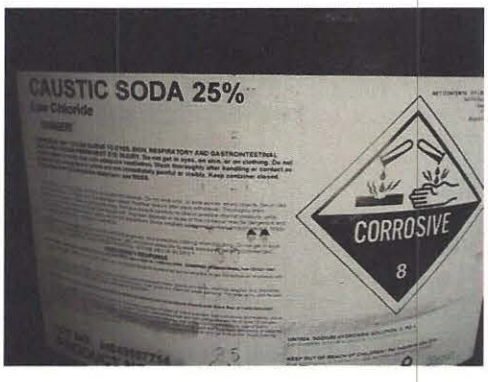
An eye wash station is located nearby in the Spring Creek well room. It is recommended that an additional eye wash station be installed in the chemical room. The water system has a diesel powered generator for emergency power to operate the system if needed. The floor of the generator room, Spring Creek well room and chemical treatment room have in the floor heating powered by propane on site. The building was securely locked and fenced and had adequate ventilation, floor drains, lighting and heating.



Injection point on Spring Creek well out to distribution



Chemical room at Spring Creek well house



Storage and Pumping

The water storage reservoir is a 130,000-gallon concrete storage tank which sits above grade west of the city. The overflow is screened, as is the vent on top of the tank. The reservoir is a flow through system. It can also be isolated from the water system through a series of valves for maintenance purposes.

The reservoir roof has been replaced with a pitched roof to preclude the possibility of pooling water. The exterior of the reservoir has some minor weeping that needs to be monitored and repaired as needed. The reservoir appeared to be well maintained and secure with the ladder leading to the roof hatch securely locked. The area is not fenced but it is somewhat remote access and inspected by water system staff regularly.



Reservoir



Flow to waste screened



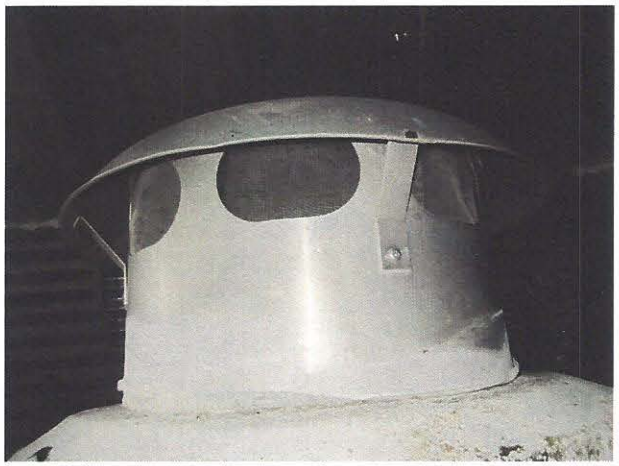
Locked entry to reservoir roof & hatch



Telemetry antennae



Hatch to reservoir



Reservoir vent, properly screened



Interior of reservoir roof



Reservoir roof

Distribution

The water distribution system can be divided into two distinct parts that serve different functions. The first is the 12-inch PVC transmission line that connects the well to the water storage tank. The second is the actual water distribution system. There is one service connection on the transmission line. Fluctuating water pressure on the transmission line was remedied by the soft start and stop functions of the well pump controller.

The second part of the distribution system is the water mains that serve the water system customers. It consists of the older cast iron pipe and newer PVC mains. The water mains range in size from 2-inch to 10-inch. The water system is partially looped. There are dead end mains but the city has them on a monthly flushing schedule to prevent problems with stagnant water. There are approximately 42 fire hydrants on the city distribution mains. Some of the fire hydrants are connected to the 4-inch mains. The coliform testing is done on a rotating basis using sampling locations in different parts of the city.

Per the operator of the system, there is approximately 40 to 45% loss of water due to leaks within the system. This is a significant water loss and a significant cost to your water system. We discussed a referral to Lane McWilliams who can provide you with information on the Energy Smart program to help you with the cost of minimizing the water loss in your system. We also discussed the State Revolving Fund (SRF) and other sources of finding to finance the needed repairs and upgrades to your water system. If you would like more information on the SRF loan program through the State of Idaho, please contact Katy Baker at the DEQ Coeur d'Alene Regional office at 208-769-1422.

The city has a Cross Connection Control Ordinance. The water system must ensure that cross connections do not exist or are isolated from the potable water system by an approved backflow prevention assembly. Backflow prevention assemblies shall be inspected and tested annually for functionality by an Idaho licensed tester, as specified in Subsection 552.06.c. Annual backflow testing of all backflow assemblies installed on underground sprinkler systems within distribution is required.

Administration

Please complete the enclosed managerial and financial capacity forms and return with your Plan of Corrections.

Operator Certification
Mr. William Harp is the Designated Operator in Charge and holds a DWD1-10703 and DWT1-17152 license through 4/28/2014. Josh Derby provides support operation of the system and holds a DWD1-19184 license which expires 7/16/2014. The designated backup operator is Robert Hansen of Water Systems Management who is fully licensed to operate distribution 1 and treatment 1 water systems.

Monitoring
Please refer to the Public Water System Switchboard for current monitoring schedules and other important information located at: http://www.deq.idaho.gov/water-quality/drinking-water/pws-switchboard.aspx

9th Street well:
Nitrate -- 1 per year
Nitrite – 1 per 9 years

Spring Creek well:
Alpha– 1 routine per 9 years
R226/R228/R6&8 - 1 routine per 6 years
Uranium – 1 routine per 9 years
Fluoride – 1 routine per 9 years
IOCs – 1 routine per 9 years
Sodium -- 1 routine per 3 years
VOCs – 1 routine per 6 years
Arsenic – 1 routine per 9 years
Nitrate -- 1 per year
Nitrite – 1 per 9 years

Distribution:
Coliform – 1 routine per month
Disinfection By Products (DBP) – 1 routine per year
Total Haloacetic Acid (HAA5) – 1 per quarter due between 10/01/2013 and 12/31/2013 @ 904 Cedar
TTHM - 1 per quarter due between 10/01/2013 and 12/31/2013 @ 101 Stephens
(HAA5 & TTHM quarterly schedules are for 1 year and will be re-evaluated for reduction to annual monitoring after the completion of 4 consecutive quarters)
Lead Copper – 5 routine per year for 3 years
The Lead Copper samples should not be completed earlier than the third year of each three year cycle. By taking it earlier, you will be re-setting the three year cycle prematurely and testing more often than necessary. If you have any questions on this monitoring, please contact me. This does not apply to the other monitoring schedules.

Conclusion
At the time of the survey it was evident that Mr. Bill Harp and Mayor Jeff Jeffers take their responsibility of providing water to the users of the City of Clark Fork seriously; his efforts are appreciated by the Department. The City of Clark Fork water system was found to be in compliance with the Idaho Rules for Public Drinking Water Systems. No significant deficiencies were noted during this sanitary survey.

The Department strongly recommends that the City of Clark Fork develop a plan for financing the needed repairs and upgrades to their water system. It was discussed that the 4-inch lines on all fire hydrants be replaced with 6-inch lines to correct the problem of low fire flows; replace deteriorating lines/mains to 6-inch lines with the priority on locating and replacing the leaking lines; repair and replace valves in distribution system; repair and add an additional reservoir; change the corrosion control chemical to sodium bicarbonate (soda ash) which is much safer to work with than the current 25% sodium hydroxide (caustic soda) solution.

The deficiencies and recommendations listed below need to be addressed in a written Plan of Correction (POC) and submitted to DEQ within 30 days of the receipt of this letter. The POC is a simple narrative document that lists the deficiencies and additional requirements, how they will be corrected, and the date by which correction will be completed.

Deficiencies and Requirements

1. The water system must ensure that cross connections do not exist or are isolated from the potable water system by an approved backflow prevention assembly. Backflow prevention assemblies shall be inspected and tested annually for functionality by an Idaho licensed tester, as specified in Subsection 552.06.c. Annual backflow testing of all backflow assemblies installed on underground sprinkler systems within distribution is required.

2. Please complete the enclosed Financial and Managerial Capacity forms and return to the Department along with your plan of corrections.

3. It is required that any dead end distribution mains must be flushed every six months.

Follow up Items

1. If at any time there is a depressurization event, the District must provide public notification and also notify the DEQ.

Recommendations:

1. The Department strongly recommends that the City of Clark Fork develop a plan for financing the needed repairs and upgrades to their water system. It was discussed that the 4-inch lines on all fire hydrants be replaced with 6-inch lines to correct the problem of low fire flows; replace deteriorating lines/mains to 6-inch lines with the priority on locating and replacing the leaking lines; repair and replace valves in distribution system; repair and add an additional reservoir; change the corrosion control chemical to sodium bicarbonate (soda ash) which is much safer to work with than the current 25% sodium hydroxide (caustic soda) solution.

2. The Department recommends that an additional eye wash station be added in the chemical room at the Spring Creek well house.

3. The Department recommends the reservoir be inspected and cleaned every five years.

4. The Department recommends the valves in distribution be exercised annually.

5. The Department recommends an operation and maintenance manual be provided for the drinking water system. Operation and maintenance manuals should include daily operating instructions, trouble shooting, operator safety procedures, location of valves and other key system features, parts lists and parts order forms, and information for contacting the water system operator.

Jean Felker — September 6, 2013

Jean Felker — Date

Appendix F-1

Historical Budgetary Information
FY 2012-2017

CITY OF CLARK FORK - WATER FUND
Profit & Loss Budget vs. Actual
October 2011 through September 2012

	Oct '11 - ...	Budget	$ Over Bu...	% of Bud...
Income				
4130000 · Water Sales	90,000.10	73,000.00	17,000.10	123.3%
4250000 · Operating Transfer Income	0.00	7,184.00	-7,184.00	0.0%
4450000 · Penalty & Interest	380.00	1,800.00	-1,420.00	21.1%
4670000 · Interest Income	179.25	200.00	-20.75	89.6%
4680000 · Disconnect/Reconnect Fees	0.00	0.00	0.00	0.0%
4690000 · Hook-Up Fees	10,000.00	5,000.00	5,000.00	200.0%
4700000 · Donations & Miscellaneous	0.00	0.00	0.00	0.0%
Total Income	100,559.35	87,184.00	13,375.35	115.3%
Gross Profit	100,559.35	87,184.00	13,375.35	115.3%
Expense				
00 · missing check from package	0.00			
6000000 · Salaries & Wages				
6000300 · Wages - City Clerk				
6000301 · Wages - City Clerk 1	3,757.92	4,054.00	-296.08	92.7%
6000302 · Wages - City Clerk 2	2,336.74	2,375.00	-38.26	98.4%
6000300 · Wages - City Clerk - Other	-206.72			
Total 6000300 · Wages - City Clerk	5,887.94	6,429.00	-541.06	91.6%
6000600 · Wages - Maintenance				
6000601 · Wages - Maintenance 1	5,532.39	3,506.00	2,026.39	157.8%
6000602 · Wages - Maintenance 2	4,674.50	3,603.00	1,071.50	129.7%
6000600 · Wages - Maintenance - Other	-318.05			
Total 6000600 · Wages - Maintenance	9,888.84	7,109.00	2,779.84	139.1%
6000000 · Salaries & Wages - Other	-15.00			
Total 6000000 · Salaries & Wages	15,761.78	13,538.00	2,223.78	116.4%
6020000 · Payroll Taxes				
6020100 · Payroll Taxes - FICA	785.63	839.00	-53.37	93.6%
6020200 · Payroll Taxes - Medicare	220.28	196.00	24.28	112.4%
6020300 · Payroll Taxes - SUTA	0.00	0.00	0.00	0.0%
6020000 · Payroll Taxes - Other	-17.38			
Total 6020000 · Payroll Taxes	988.53	1,035.00	-46.47	95.5%
6030000 · Retirement	1,577.18	1,407.00	170.18	112.1%
6040000 · State Ins Fund - Worker's Comp	590.40	650.00	-59.60	90.8%
6250000 · Repair & Maintenance				
6250100 · Repair & Maint - Meter Installs	0.00	1,550.00	-1,550.00	0.0%
6250200 · Repair & Maint - Water System	0.00	2,950.00	-2,950.00	0.0%
6250300 · Repair & Maint - Gen Wtr Dept	0.00	550.00	-550.00	0.0%
6250400 · Repair & Maint - Upgrade Lines	0.00	200.00	-200.00	0.0%
6250600 · Repair & Maint - Pumphouse 1	1,532.43	600.00	932.43	255.4%
6250700 · Repair & Maint - Pumphouse 2	0.00	0.00	0.00	0.0%
6250800 · Repair & Maint - Vehicles	47.14	150.00	-102.86	31.4%
6250000 · Repair & Maintenance - Other	891.84			
Total 6250000 · Repair & Maintenance	2,471.41	6,000.00	-3,528.59	41.2%
6300000 · Insurance	1,278.60	1,279.00	-0.40	100.0%
6350000 · Telephone	1,093.02	800.00	293.02	136.6%
6360000 · Utilities	5,033.33	4,000.00	1,033.33	125.8%
6370000 · Water Treatment & Testing				
6370100 · Wtr Treat & Test-Coliform Bact	520.00	300.00	220.00	173.3%
6370200 · Wtr Treat & Test-DEQ Water Fees	3,168.00	1,100.00	2,068.00	288.0%
6370300 · Wtr Treat & Test-Caustic Soda	3,985.93	3,500.00	485.93	113.9%
6370400 · Wtr Treat & Test-Chlorine	0.00	1,350.00	-1,350.00	0.0%
6370500 · Wtr Treat & Test-Other	1,304.84	1,250.00	54.84	104.4%
6370000 · Water Treatment & Testing - Other	2,003.55			
Total 6370000 · Water Treatment & Testing	10,982.32	7,500.00	3,482.32	146.4%

CITY OF CLARK FORK - WATER FUND
Profit & Loss Budget vs. Actual
October 2011 through September 2012

	Oct '11 - ...	Budget	$ Over Bu...	% of Bud...
6400000 · Professional Fees				
6400100 · Professional Fees - Engineer	0.00	2,000.00	-2,000.00	0.0%
6400200 · Professional Fees - Auditor	2,041.25	1,625.00	416.25	125.6%
6400300 · Professional Fees - Legal	0.00	0.00	0.00	0.0%
6400400 · Professional Fees - Back-Up Op	1,300.00	1,200.00	100.00	108.3%
Total 6400000 · Professional Fees	3,341.25	4,825.00	-1,483.75	69.2%
6420000 · Travel	0.00	0.00	0.00	0.0%
6470000 · Office Expenses				
6470100 · Office Expense - Supplies	1,166.48	1,300.00	-133.52	89.7%
6470200 · Office Expense - Bank Charges	11.05	0.00	11.05	100.0%
6470300 · Office Expense - Sftwre/Support	1,500.00	1,500.00	0.00	100.0%
6470400 · Office Expense - Other	0.00	0.00	0.00	0.0%
Total 6470000 · Office Expenses	2,677.53	2,800.00	-122.47	95.6%
6500000 · Interest Expense	4,534.82	5,200.00	-665.18	87.2%
6540000 · Leases	200.00	250.00	-50.00	80.0%
6570000 · Reserve	21,926.00	25,000.00	-3,074.00	87.7%
6650000 · Legal Notices & Printing	68.75	200.00	-131.25	34.4%
66900 · Reconciliation Discrepancies	2,305.36			
6700000 · Dues, Training & Subscriptions	585.00	500.00	85.00	117.0%
6720000 · Miscellaneous	82.98	0.00	82.98	100.0%
6800000 · Gas & Oil	1,020.87	1,200.00	-179.13	85.1%
6960000 · Capital Improvements	0.00	10,000.00	-10,000.00	0.0%
6970000 · Equipment Purchase	0.00	1,000.00	-1,000.00	0.0%
80000 · MISPRINTED CHECK	0.00			
Total Expense	76,519.13	87,184.00	-10,664.87	87.8%
Net Income	**24,040.22**	**0.00**	**24,040.22**	**100.0%**

CITY OF CLARK FORK - WATER FUND
Profit & Loss Budget vs. Actual
October 2012 through September 2013

	Oct '12 - ...	Budget	$ Over Bu...	% of Bud...
Income				
4130000 · Water Sales				
4130100 · Bulk Water Sales	433.40			
4130000 · Water Sales - Other	103,826.59	83,675.00	20,151.59	124.1%
Total 4130000 · Water Sales	104,259.99	83,675.00	20,584.99	124.6%
4450000 · Penalty & Interest	0.00	600.00	-600.00	0.0%
4670000 · Interest Income	205.97	200.00	5.97	103.0%
4690000 · Hook-Up Fees	0.00	5,000.00	-5,000.00	0.0%
4700000 · Donations & Miscellaneous	113.25			
Total Income	104,579.21	89,475.00	15,104.21	116.9%
Gross Profit	104,579.21	89,475.00	15,104.21	116.9%
Expense				
6000000 · Salaries & Wages				
6000300 · Wages - City Clerk				
6000301 · Wages - City Clerk 1	3,748.77	4,217.00	-468.23	88.9%
6000302 · Wages - City Clerk 2	2,217.09	2,468.00	-250.91	89.8%
6000300 · Wages - City Clerk - Other	-350.00	0.00	-350.00	100.0%
Total 6000300 · Wages - City Clerk	5,615.86	6,685.00	-1,069.14	84.0%
6000600 · Wages - Maintenance				
6000601 · Wages - Maintenance 1	5,255.20	3,645.00	1,610.20	144.2%
6000602 · Wages - Maintenance 2	4,444.40	3,749.00	695.40	118.5%
6000600 · Wages - Maintenance - Other	-422.00	0.00	-422.00	100.0%
Total 6000600 · Wages - Maintenance	9,277.60	7,394.00	1,883.60	125.5%
Total 6000000 · Salaries & Wages	14,893.46	14,079.00	814.46	105.8%
6020000 · Payroll Taxes				
6020100 · Payroll Taxes - FICA	696.26	1,072.00	-375.74	64.9%
6020200 · Payroll Taxes - Medicare	227.15	0.00	227.15	100.0%
6020000 · Payroll Taxes - Other	-46.00	0.00	-46.00	100.0%
Total 6020000 · Payroll Taxes	877.41	1,072.00	-194.59	81.8%
6030000 · Retirement	1,627.65	1,206.00	421.65	135.0%
6040000 · State Ins Fund - Worker's Comp	274.60	590.00	-315.40	46.5%
6250000 · Repair & Maintenance				
6250100 · Repair & Maint - Meter Installs	215.50			
6250200 · Repair & Maint - Water System	2,809.81	0.00	2,809.81	100.0%
6250300 · Repair & Maint - Gen Wtr Dept	791.16	0.00	791.16	100.0%
6250400 · Repair & Maint - Upgrade Lines	2,660.00			
6250600 · Repair & Maint - Pumphouse 1	146.14	0.00	146.14	100.0%
6250800 · Repair & Maint - Vehicles	163.89			
6250000 · Repair & Maintenance - Other	160.03	6,000.00	-5,839.97	2.7%
Total 6250000 · Repair & Maintenance	6,946.53	6,000.00	946.53	115.8%
6300000 · Insurance	763.40	1,279.00	-515.60	59.7%
6350000 · Telephone	901.18	900.00	1.18	100.1%
6360000 · Utilities	5,331.08	4,500.00	831.08	118.5%
6370000 · Water Treatment & Testing				
6370100 · Wtr Treat & Test-Coliform Bact	260.00	0.00	260.00	100.0%
6370200 · Wtr Treat & Test-DEQ Water Fees	1,056.00	1,100.00	-44.00	96.0%
6370300 · Wtr Treat & Test-Caustic Soda	5,456.93			
6370400 · Wtr Treat & Test-Chlorine	720.65	0.00	720.65	100.0%
6370500 · Wtr Treat & Test-Other	1,040.35	0.00	1,040.35	100.0%
6370000 · Water Treatment & Testing - Other	0.00	7,500.00	-7,500.00	0.0%
Total 6370000 · Water Treatment & Testing	8,533.93	8,600.00	-66.07	99.2%
6400000 · Professional Fees				
6400100 · Professional Fees - Engineer	0.00	2,000.00	-2,000.00	0.0%
6400200 · Professional Fees - Auditor	4,001.25	1,800.00	2,201.25	222.3%

CITY OF CLARK FORK - WATER FUND
Profit & Loss Budget vs. Actual
October 2012 through September 2013

	Oct '12 - ...	Budget	$ Over Bu...	% of Bud...
6400300 · Professional Fees - Legal	70.00	0.00	70.00	100.0%
6400400 · Professional Fees - Back-Up Op	1,100.00	1,200.00	-100.00	91.7%
Total 6400000 · Professional Fees	5,171.25	5,000.00	171.25	103.4%
6470000 · Office Expenses				
6470100 · Office Expense - Supplies	414.00			
6470200 · Office Expense - Bank Charges	5.00			
6470300 · Office Expense - Sftwre/Support	2,118.00			
6470000 · Office Expenses - Other	-5.00	2,800.00	-2,805.00	-0.2%
Total 6470000 · Office Expenses	2,532.00	2,800.00	-268.00	90.4%
6500000 · Interest Expense	4,946.94	5,200.00	-253.06	95.1%
6540000 · Leases	200.00	250.00	-50.00	80.0%
6570000 · Reserve	21,136.03	25,000.00	-3,863.97	84.5%
6650000 · Legal Notices & Printing	0.00	200.00	-200.00	0.0%
66900 · Reconciliation Discrepancies	0.09			
6700000 · Dues, Training & Subscriptions	264.00	150.00	114.00	176.0%
6720000 · Miscellaneous	75.59			
6800000 · Gas & Oil	799.37	1,200.00	-400.63	66.6%
6960000 · Capital Improvements	0.00	9,018.00	-9,018.00	0.0%
6970000 · Equipment Purchase	0.00	2,500.00	-2,500.00	0.0%
80000 · MISPRINTED CHECK	0.00			
Total Expense	75,274.51	89,544.00	-14,269.49	84.1%
Net Income	**29,304.70**	**-69.00**	**29,373.70**	**-42,470.6%**

CITY OF CLARK FORK - WATER FUND
Profit & Loss Budget vs. Actual
October 2013 through September 2014

	Oct '13 - ...	Budget	$ Over Bu...	% of Bud...
Income				
4130000 · Water Sales				
4130100 · Bulk Water Sales	20.00	0.00	20.00	100.0%
4130000 · Water Sales - Other	110,288.39	108,000.00	2,288.39	102.1%
Total 4130000 · Water Sales	110,308.39	108,000.00	2,308.39	102.1%
4450000 · Penalty & Interest	0.00	600.00	-600.00	0.0%
4650000 · Sale of Assets	750.00			
4670000 · Interest Income	143.22	155.04	-11.82	92.4%
4690000 · Hook-Up Fees	0.00	4,999.92	-4,999.92	0.0%
4700000 · Donations & Miscellaneous	0.00	0.00	0.00	0.0%
Total Income	111,201.61	113,754.96	-2,553.35	97.8%
Gross Profit	111,201.61	113,754.96	-2,553.35	97.8%
Expense				
6000000 · Salaries & Wages				
6000300 · Wages - City Clerk				
6000301 · Wages - City Clerk 1	4,540.88	0.00	4,540.88	100.0%
6000302 · Wages - City Clerk 2	2,392.26	0.00	2,392.26	100.0%
6000300 · Wages - City Clerk - Other	0.00	6,951.96	-6,951.96	0.0%
Total 6000300 · Wages - City Clerk	6,933.14	6,951.96	-18.82	99.7%
6000600 · Wages - Maintenance				
6000601 · Wages - Maintenance 1	7,020.26	0.00	7,020.26	100.0%
6000602 · Wages - Maintenance 2	5,211.22	0.00	5,211.22	100.0%
6000600 · Wages - Maintenance - Other	0.00	11,479.92	-11,479.92	0.0%
Total 6000600 · Wages - Maintenance	12,231.48	11,479.92	751.56	106.5%
6000000 · Salaries & Wages - Other	-40.00			
Total 6000000 · Salaries & Wages	19,124.62	18,431.88	692.74	103.8%
6020000 · Payroll Taxes				
6020100 · Payroll Taxes - FICA	1,010.98	0.00	1,010.98	100.0%
6020200 · Payroll Taxes - Medicare	277.88	0.00	277.88	100.0%
6020000 · Payroll Taxes - Other	0.00	1,410.00	-1,410.00	0.0%
Total 6020000 · Payroll Taxes	1,288.86	1,410.00	-121.14	91.4%
6030000 · Retirement	1,991.23	2,085.96	-94.73	95.5%
6040000 · State Ins Fund - Worker's Comp	-22.00	650.04	-672.04	-3.4%
6250000 · Repair & Maintenance				
6250100 · Repair & Maint - Meter Installs	1,134.63	0.00	1,134.63	100.0%
6250200 · Repair & Maint - Water System	1,199.72	0.00	1,199.72	100.0%
6250300 · Repair & Maint - Gen Wtr Dept	3,214.17	0.00	3,214.17	100.0%
6250400 · Repair & Maint - Upgrade Lines	2,987.50	0.00	2,987.50	100.0%
6250600 · Repair & Maint - Pumphouse 1	614.27	0.00	614.27	100.0%
6250800 · Repair & Maint - Vehicles	100.00	0.00	100.00	100.0%
6250900 · Rental of tools	114.00			
6250000 · Repair & Maintenance - Other	1,196.72	6,999.96	-5,803.24	17.1%
Total 6250000 · Repair & Maintenance	10,561.01	6,999.96	3,561.05	150.9%
6300000 · Insurance	1,240.00	1,278.96	-38.96	97.0%
6350000 · Telephone	1,302.19	900.00	402.19	144.7%
6360000 · Utilities	4,011.67	5,199.96	-1,188.29	77.1%
6370000 · Water Treatment & Testing				
6370100 · Wtr Treat & Test-Coliform Bact	220.00	0.00	220.00	100.0%
6370200 · Wtr Treat & Test-DEQ Water Fees	528.00	1,099.92	-571.92	48.0%
6370300 · Wtr Treat & Test-Caustic Soda	5,658.85	0.00	5,658.85	100.0%
6370400 · Wtr Treat & Test-Chlorine	1,630.05	0.00	1,630.05	100.0%
6370500 · Wtr Treat & Test-Other	2,980.97	0.00	2,980.97	100.0%
6370000 · Water Treatment & Testing - Other	0.00	7,500.00	-7,500.00	0.0%

CITY OF CLARK FORK - WATER FUND
Profit & Loss Budget vs. Actual
October 2013 through September 2014

	Oct '13 - ...	Budget	$ Over Bu...	% of Bud...
Total 6370000 · Water Treatment & Testing	11,017.87	8,599.92	2,417.95	128.1%
6400000 · Professional Fees				
6400100 · Professional Fees - Engineer	0.00	1,999.92	-1,999.92	0.0%
6400200 · Professional Fees - Auditor	2,550.00	1,800.00	750.00	141.7%
6400300 · Professional Fees - Legal	175.85	300.00	-124.15	58.6%
6400400 · Professional Fees - Back-Up Op	1,100.00	1,200.00	-100.00	91.7%
Total 6400000 · Professional Fees	3,825.85	5,299.92	-1,474.07	72.2%
6420000 · Travel	0.00	0.00	0.00	0.0%
6470000 · Office Expenses				
6470100 · Office Expense - Supplies	1,211.60	0.00	1,211.60	100.0%
6470200 · Office Expense - Bank Charges	8.50	0.00	8.50	100.0%
6470300 · Office Expense - Sftwre/Support	4,778.96	0.00	4,778.96	100.0%
6470400 · Office Expense - Other	80.21			
6470000 · Office Expenses - Other	0.00	3,000.00	-3,000.00	0.0%
Total 6470000 · Office Expenses	6,079.27	3,000.00	3,079.27	202.6%
6500000 · Interest Expense	4,357.08	5,199.96	-842.88	83.8%
6540000 · Leases	200.00	249.96	-49.96	80.0%
6570000 · Reserve	21,169.35	25,116.00	-3,946.65	84.3%
6650000 · Legal Notices & Printing	75.85	199.92	-124.07	37.9%
66900 · Reconciliation Discrepancies	45.39	0.00	45.39	100.0%
6700000 · Dues, Training & Subscriptions	1,438.00	264.00	1,174.00	544.7%
6720000 · Miscellaneous	178.60	0.00	178.60	100.0%
6800000 · Gas & Oil	1,921.36	1,200.00	721.36	160.1%
6960000 · Capital Improvements	0.00	25,284.00	-25,284.00	0.0%
6970000 · Equipment Purchase	0.00	2,511.96	-2,511.96	0.0%
80000 · MISPRINTED CHECK	0.00	0.00	0.00	0.0%
Total Expense	89,806.20	113,882.40	-24,076.20	78.9%
Net Income	**21,395.41**	**-127.44**	**21,522.85**	**-16,788.6%**

CITY OF CLARK FORK - WATER FUND
Profit & Loss Budget vs. Actual
October 2014 through September 2015

	Oct '14 - ...	Budget	$ Over Bu...	% of Bud...
Income				
4130000 · Water Sales				
4130100 · Bulk Water Sales	369.58	0.00	369.58	100.0%
4130000 · Water Sales - Other	135,863.56	108,000.00	27,863.56	125.8%
Total 4130000 · Water Sales	136,233.14	108,000.00	28,233.14	126.1%
4450000 · Penalty & Interest	0.00	0.00	0.00	0.0%
4650000 · Sale of Assets	4,566.00			
4670000 · Interest Income	268.70	199.92	68.78	134.4%
4690000 · Hook-Up Fees	1,150.78	9,999.96	-8,849.18	11.5%
4700000 · Donations & Miscellaneous	0.00	0.00	0.00	0.0%
Total Income	142,218.62	118,199.88	24,018.74	120.3%
Gross Profit	142,218.62	118,199.88	24,018.74	120.3%
Expense				
6000000 · Salaries & Wages				
6000300 · Wages - City Clerk				
6000301 · Wages - City Clerk 1	5,987.53	5,789.16	198.37	103.4%
6000302 · Wages - City Clerk 2	2,958.03	2,808.00	150.03	105.3%
6000300 · Wages - City Clerk - Other	0.00	0.00	0.00	0.0%
Total 6000300 · Wages - City Clerk	8,945.56	8,597.16	348.40	104.1%
6000600 · Wages - Maintenance				
6000601 · Wages - Maintenance 1	5,904.10	7,884.24	-1,980.14	74.9%
6000602 · Wages - Maintenance 2	3,868.90	4,990.44	-1,121.54	77.5%
6000600 · Wages - Maintenance - Other	0.00	0.00	0.00	0.0%
Total 6000600 · Wages - Maintenance	9,773.00	12,874.68	-3,101.68	75.9%
6000000 · Salaries & Wages - Other	-314.00			
Total 6000000 · Salaries & Wages	18,404.56	21,471.84	-3,067.28	85.7%
6020000 · Payroll Taxes				
6020100 · Payroll Taxes - FICA	1,160.55	1,643.04	-482.49	70.6%
6020200 · Payroll Taxes - Medicare	271.42	0.00	271.42	100.0%
6020000 · Payroll Taxes - Other	0.00	0.00	0.00	0.0%
Total 6020000 · Payroll Taxes	1,431.97	1,643.04	-211.07	87.2%
6030000 · Retirement	0.00	2,230.92	-2,230.92	0.0%
6035000 · PERSI Pension Expense	1,556.85			
6040000 · State Ins Fund - Worker's Comp	15.00	681.00	-666.00	2.2%
6050000 · Contract Labor	225.00			
6250000 · Repair & Maintenance				
6250100 · Repair & Maint - Meter Installs	463.95	0.00	463.95	100.0%
6250200 · Repair & Maint - Water System	1,558.14	0.00	1,558.14	100.0%
6250300 · Repair & Maint - Gen Wtr Dept	8,623.48	0.00	8,623.48	100.0%
6250400 · Repair & Maint - Upgrade Lines	0.00	0.00	0.00	0.0%
6250600 · Repair & Maint - Pumphouse 1	902.96	0.00	902.96	100.0%
6250800 · Repair & Maint - Vehicles	42.10	0.00	42.10	100.0%
6250900 · Rental of tools	72.00			
6250000 · Repair & Maintenance - Other	0.00	9,000.00	-9,000.00	0.0%
Total 6250000 · Repair & Maintenance	11,662.63	9,000.00	2,662.63	129.6%
6300000 · Insurance	1,090.10	1,561.92	-471.82	69.8%
6350000 · Telephone	1,029.74	900.00	129.74	114.4%
6360000 · Utilities	3,046.40	8,499.96	-5,453.56	35.8%
6370000 · Water Treatment & Testing				
6370100 · Wtr Treat & Test-Coliform Bact	570.00	0.00	570.00	100.0%
6370200 · Wtr Treat & Test-DEQ Water Fees	264.00	0.00	264.00	100.0%
6370300 · Wtr Treat & Test-Caustic Soda	1,989.00	0.00	1,989.00	100.0%
6370400 · Wtr Treat & Test-Chlorine	794.90	0.00	794.90	100.0%
6370500 · Wtr Treat & Test-Other	1,019.97	0.00	1,019.97	100.0%

CITY OF CLARK FORK - WATER FUND
Profit & Loss Budget vs. Actual
October 2014 through September 2015

	Oct '14 - ...	Budget	$ Over Bu...	% of Bud...
6370000 · Water Treatment & Testing - Other	0.00	8,599.92	-8,599.92	0.0%
Total 6370000 · Water Treatment & Testing	4,637.87	8,599.92	-3,962.05	53.9%
6400000 · Professional Fees				
6400100 · Professional Fees - Engineer	0.00	900.00	-900.00	0.0%
6400200 · Professional Fees - Auditor	3,501.26	1,974.96	1,526.30	177.3%
6400300 · Professional Fees - Legal	30.00	300.00	-270.00	10.0%
6400400 · Professional Fees - Back-Up Op	1,300.00	1,200.00	100.00	108.3%
Total 6400000 · Professional Fees	4,831.26	4,374.96	456.30	110.4%
6420000 · Travel	0.00	499.92	-499.92	0.0%
6470000 · Office Expenses				
6470100 · Office Expense - Supplies	759.16	0.00	759.16	100.0%
6470200 · Office Expense - Bank Charges	51.30	0.00	51.30	100.0%
6470300 · Office Expense - Sftwre/Support	2,441.49	0.00	2,441.49	100.0%
6470000 · Office Expenses - Other	0.00	1,999.92	-1,999.92	0.0%
Total 6470000 · Office Expenses	3,251.95	1,999.92	1,252.03	162.6%
6500000 · Interest Expense	4,395.92	5,199.96	-804.04	84.5%
6540000 · Leases	200.00	249.96	-49.96	80.0%
6570000 · Reserve	21,123.00	24,996.00	-3,873.00	84.5%
6650000 · Legal Notices & Printing	0.00	199.92	-199.92	0.0%
66900 · Reconciliation Discrepancies	-1.04	0.00	-1.04	100.0%
6700000 · Dues, Training & Subscriptions	1,488.00	1,200.00	288.00	124.0%
6720000 · Miscellaneous	396.05	0.00	396.05	100.0%
6800000 · Gas & Oil	842.29	1,200.00	-357.71	70.2%
6960000 · Capital Improvements	0.00	27,777.96	-27,777.96	0.0%
6970000 · Equipment Purchase	601.96	2,499.96	-1,898.00	24.1%
80000 · MISPRINTED CHECK	0.00	0.00	0.00	0.0%
9500 · Bonner County Treasurer	45.00			
Total Expense	80,274.51	124,787.16	-44,512.65	64.3%
Net Income	**61,944.11**	**-6,587.28**	**68,531.39**	**-940.4%**

CITY OF CLARK FORK - WATER FUND
Profit & Loss Budget vs. Actual
October 2015 through September 2016

	Oct '15 - Sep 16	Budget	$ Over Budget	% of Budget
Income				
4130000 · Water Sales				
4130100 · Bulk Water Sales	305.52	0.00	305.52	100.0%
4130000 · Water Sales - Other	123,826.83	115,000.44	8,826.39	107.7%
Total 4130000 · Water Sales	124,132.35	115,000.44	9,131.91	107.9%
4650000 · Sale of Assets	0.00	0.00	0.00	0.0%
4670000 · Interest Income	681.98	200.00	481.98	341.0%
4690000 · Hook-Up Fees	5,000.00	10,000.00	-5,000.00	50.0%
Total Income	129,814.33	125,200.44	4,613.89	103.7%
Gross Profit	129,814.33	125,200.44	4,613.89	103.7%
Expense				
6000000 · Salaries & Wages				
6000300 · Wages - City Clerk				
6000301 · Wages - City Clerk 1	5,760.65	8,105.76	-2,345.11	71.1%
6000302 · Wages - City Clerk 2	2,266.50	4,160.00	-1,893.50	54.5%
Total 6000300 · Wages - City Clerk	8,027.15	12,265.76	-4,238.61	65.4%
6000600 · Wages - Maintenance				
6000601 · Wages - Maintenance 1	6,041.20	8,985.60	-2,944.40	67.2%
6000602 · Wages - Maintenance 2	4,170.36	4,588.48	-418.12	90.9%
Total 6000600 · Wages - Maintenance	10,211.56	13,574.08	-3,362.52	75.2%
6000000 · Salaries & Wages - Other	195.00	0.00	195.00	100.0%
Total 6000000 · Salaries & Wages	18,433.71	25,839.84	-7,406.13	71.3%
6020000 · Payroll Taxes				
6020100 · Payroll Taxes - FICA	1,130.81	1,976.75	-845.94	57.2%
6020200 · Payroll Taxes - Medicare	264.45	0.00	264.45	100.0%
Total 6020000 · Payroll Taxes	1,395.26	1,976.75	-581.49	70.6%
6030000 · Retirement	0.00	2,684.76	-2,684.76	0.0%
6035000 · PERSI Pension Expense	2,618.00			
6040000 · State Ins Fund - Worker's Comp	636.30	732.00	-95.70	86.9%
6250000 · Repair & Maintenance				
6250100 · Repair & Maint - Meter Installs	3,116.39	0.00	3,116.39	100.0%
6250200 · Repair & Maint - Water System	4,140.24	0.00	4,140.24	100.0%
6250300 · Repair & Maint - Gen Wtr Dept	672.09	0.00	672.09	100.0%
6250400 · Repair & Maint - Upgrade Lines	0.00	0.00	0.00	0.0%
6250600 · Repair & Maint - Pumphouse 1	880.82	0.00	880.82	100.0%
6250800 · Repair & Maint - Vehicles	106.96	0.00	106.96	100.0%
6250900 · Rental of tools	79.00	0.00	79.00	100.0%
6250000 · Repair & Maintenance - Other	246.09	9,000.00	-8,753.91	2.7%
Total 6250000 · Repair & Maintenance	9,241.59	9,000.00	241.59	102.7%
6300000 · Insurance	1,252.60	1,240.00	12.60	101.0%
6350000 · Telephone	1,071.71	900.00	171.71	119.1%
6360000 · Utilities	3,678.15	8,500.00	-4,821.85	43.3%
6370000 · Water Treatment & Testing				
6370100 · Wtr Treat & Test-Coliform Bact	443.06	0.00	443.06	100.0%
6370200 · Wtr Treat & Test-DEQ Water Fees	1,056.00	1,100.00	-44.00	96.0%
6370300 · Wtr Treat & Test- Soda Ash	2,069.00	0.00	2,069.00	100.0%
6370400 · Wtr Treat & Test-Chlorine	1,125.66	0.00	1,125.66	100.0%
6370500 · Wtr Treat & Test-Other	1,381.46	0.00	1,381.46	100.0%
6370000 · Water Treatment & Testing - Other	0.00	8,600.00	-8,600.00	0.0%
Total 6370000 · Water Treatment & Testing	6,075.18	9,700.00	-3,624.82	62.6%
6400000 · Professional Fees				
6400100 · Professional Fees - Engineer	10,780.00	2,000.00	8,780.00	539.0%
6400200 · Professional Fees - Auditor	1,666.75	1,875.00	-208.25	88.9%

CITY OF CLARK FORK - WATER FUND
Profit & Loss Budget vs. Actual
October 2015 through September 2016

	Oct '15 - Sep 16	Budget	$ Over Budget	% of Budget
6400300 · Professional Fees - Legal	0.00	300.00	-300.00	0.0%
6400400 · Professional Fees - Back-Up Op	1,200.00	1,200.00	0.00	100.0%
Total 6400000 · Professional Fees	13,646.75	5,375.00	8,271.75	253.9%
6420000 · Travel	0.00	500.00	-500.00	0.0%
6470000 · Office Expenses				
6470100 · Office Expense - Supplies	896.71	0.00	896.71	100.0%
6470200 · Office Expense - Bank Charges	0.00	0.00	0.00	0.0%
6470300 · Office Expense - Sftwre/Support	2,188.00	0.00	2,188.00	100.0%
6470400 · Office Expense - Other	0.00	0.00	0.00	0.0%
6470000 · Office Expenses - Other	0.00	3,500.00	-3,500.00	0.0%
Total 6470000 · Office Expenses	3,084.71	3,500.00	-415.29	88.1%
6500000 · Interest Expense	3,538.83	5,200.00	-1,661.17	68.1%
6540000 · Leases	200.00	250.00	-50.00	80.0%
6570000 · Reserve	22,934.84	0.00	22,934.84	100.0%
6650000 · Legal Notices & Printing	0.00	200.00	-200.00	0.0%
66900 · Reconciliation Discrepancies	-0.01	0.00	-0.01	100.0%
6700000 · Dues, Training & Subscriptions	759.99	1,200.00	-440.01	63.3%
6720000 · Miscellaneous	0.00	0.00	0.00	0.0%
6800000 · Gas & Oil	508.39	1,200.00	-691.61	42.4%
6960000 · Capital Improvements	0.00	12,201.65	-12,201.65	0.0%
6970000 · Equipment Purchase	561.50	10,000.00	-9,438.50	5.6%
80000 · MISPRINTED CHECK	0.00	0.00	0.00	0.0%
9500 · Bonner County Treasurer	25.00	0.00	25.00	100.0%
Total Expense	89,662.50	100,200.00	-10,537.50	89.5%
Net Income	**40,151.83**	**25,000.44**	**15,151.39**	**160.6%**

CITY OF CLARK FORK - WATER FUND
Profit & Loss Budget vs. Actual
October 2016 through September 2017

	Oct '16 - ...	Budget	$ Over Bu...	% of Bud...
Income				
4130000 · Water Sales				
4130100 · Bulk Water Sales	760.40	0.00	760.40	100.0%
4130000 · Water Sales - Other	130,549.97	128,000.00	2,549.97	102.0%
Total 4130000 · Water Sales	131,310.37	128,000.00	3,310.37	102.6%
4450000 · Penalty & Interest	71.91			
4650000 · Sale of Assets	0.00	0.00	0.00	0.0%
4670000 · Interest Income	1,286.25	500.00	786.25	257.3%
4690000 · Hook-Up Fees	5,000.00	10,000.00	-5,000.00	50.0%
4700000 · Donations & Miscellaneous	18,247.50			
Total Income	155,916.03	138,500.00	17,416.03	112.6%
Gross Profit	155,916.03	138,500.00	17,416.03	112.6%
Expense				
6000000 · Salaries & Wages				
6000300 · Wages - City Clerk				
6000301 · Wages - City Clerk 1	7,479.63	8,592.48	-1,112.85	87.0%
6000302 · Wages - City Clerk 2	2,949.61	4,409.60	-1,459.99	66.9%
Total 6000300 · Wages - City Clerk	10,429.24	13,002.08	-2,572.84	80.2%
6000600 · Wages - Maintenance				
6000601 · Wages - Maintenance 1	6,067.59	5,955.30	112.29	101.9%
6000602 · Wages - Maintenance 2	3,240.11	2,867.80	372.31	113.0%
Total 6000600 · Wages - Maintenance	9,307.70	8,823.10	484.60	105.5%
6000000 · Salaries & Wages - Other	-119.00	0.00	-119.00	100.0%
Total 6000000 · Salaries & Wages	19,617.94	21,825.18	-2,207.24	89.9%
6020000 · Payroll Taxes				
6020100 · Payroll Taxes - FICA	1,223.70	1,353.16	-129.46	90.4%
6020200 · Payroll Taxes - Medicare	286.19	316.47	-30.28	90.4%
Total 6020000 · Payroll Taxes	1,509.89	1,669.63	-159.74	90.4%
6030000 · Retirement	1,341.22	2,470.61	-1,129.39	54.3%
6035000 · PERSI Pension Expense	1,708.00			
6040000 · State Ins Fund - Worker's Comp	554.40	732.00	-177.60	75.7%
6250000 · Repair & Maintenance				
6250100 · Repair & Maint - Meter Installs	3,278.83	0.00	3,278.83	100.0%
6250200 · Repair & Maint - Water System	4,706.72	0.00	4,706.72	100.0%
6250300 · Repair & Maint - Gen Wtr Dept	74.57	0.00	74.57	100.0%
6250400 · Repair & Maint - Upgrade Lines	0.00	0.00	0.00	0.0%
6250600 · Repair & Maint - Pumphouse 1	1,345.46	0.00	1,345.46	100.0%
6250800 · Repair & Maint - Vehicles	1,234.41	0.00	1,234.41	100.0%
6250900 · Rental of tools	0.00	0.00	0.00	0.0%
6250000 · Repair & Maintenance - Other	65.01	9,000.00	-8,934.99	0.7%
Total 6250000 · Repair & Maintenance	10,705.00	9,000.00	1,705.00	118.9%
6300000 · Insurance	1,252.60	1,565.75	-313.15	80.0%
6350000 · Telephone	1,149.52	900.00	249.52	127.7%
6360000 · Utilities	2,493.30	6,000.00	-3,506.70	41.6%
6370000 · Water Treatment & Testing				
6370100 · Wtr Treat & Test-Coliform Bact	255.00	0.00	255.00	100.0%
6370200 · Wtr Treat & Test-DEQ Water Fees	1,107.00	1,100.00	7.00	100.6%
6370300 · Wtr Treat & Test-Caustic Soda	4,846.44	0.00	4,846.44	100.0%
6370400 · Wtr Treat & Test-Chlorine	914.84	0.00	914.84	100.0%
6370500 · Wtr Treat & Test-Other	1,303.47	0.00	1,303.47	100.0%
6370000 · Water Treatment & Testing - Other	0.00	7,500.00	-7,500.00	0.0%
Total 6370000 · Water Treatment & Testing	8,426.75	8,600.00	-173.25	98.0%
6400000 · Professional Fees				

CITY OF CLARK FORK - WATER FUND
Profit & Loss Budget vs. Actual
October 2016 through September 2017

	Oct '16 - ...	Budget	$ Over Bu...	% of Bud...
6400100 · Professional Fees - Engineer	17,580.00	3,997.77	13,582.23	439.7%
6400200 · Professional Fees - Auditor	1,937.50	1,937.50	0.00	100.0%
6400300 · Professional Fees - Legal	0.00	300.00	-300.00	0.0%
6400400 · Professional Fees - Back-Up Op	1,462.50	1,200.00	262.50	121.9%
6400000 · Professional Fees - Other	75.00			
Total 6400000 · Professional Fees	21,055.00	7,435.27	13,619.73	283.2%
6420000 · Travel	0.00	500.00	-500.00	0.0%
6470000 · Office Expenses				
6470100 · Office Expense - Supplies	583.80	0.00	583.80	100.0%
6470200 · Office Expense - Bank Charges	0.00	0.00	0.00	0.0%
6470300 · Office Expense - Sftwre/Support	2,790.79	0.00	2,790.79	100.0%
6470400 · Office Expense - Other	0.00	0.00	0.00	0.0%
6470000 · Office Expenses - Other	0.00	3,500.00	-3,500.00	0.0%
Total 6470000 · Office Expenses	3,374.59	3,500.00	-125.41	96.4%
6500000 · Interest Expense	3,517.83	5,200.00	-1,682.17	67.7%
6540000 · Leases	200.00	250.00	-50.00	80.0%
6550000 · Depreciation (SIP)	0.00	0.00	0.00	0.0%
6570000 · Reserve	23,038.97	0.00	23,038.97	100.0%
6650000 · Legal Notices & Printing	0.00	200.00	-200.00	0.0%
66900 · Reconciliation Discrepancies	0.00	0.00	0.00	0.0%
6700000 · Dues, Training & Subscriptions	709.00	1,200.00	-491.00	59.1%
6720000 · Miscellaneous	0.00	0.00	0.00	0.0%
6800000 · Gas & Oil	752.31	600.00	152.31	125.4%
6960000 · Capital Improvements	2,947.84	32,076.36	-29,128.52	9.2%
6970000 · Equipment Purchase	173.07	10,000.00	-9,826.93	1.7%
80000 · MISPRINTED CHECK	0.00	0.00	0.00	0.0%
9500 · Bonner County Treasurer	25.00	0.00	25.00	100.0%
Total Expense	104,552.23	113,724.80	-9,172.57	91.9%
Net Income	51,363.80	24,775.20	26,588.60	207.3%

Appendix F-2

CIP Project Cost Estimates and Maps

Engineer's Opinion of Preliminary Project Costs
City of Clark Fork 9th Street Well Refurbishment

Prepared By: Tom Jordan
Date: 11/20/2018

ITEM	DESCRIPTION	QTY	UNIT	EST. UNIT PRICE	EST. TOTAL COST
Well Casing Inspection					
1	Disinfection of well and equipment	1	LS	$1,500.00	$1,500.00
2	Camera Inspection	1	LS	$2,000.00	$2,000.00
				SUBTOTAL:	$3,500.00
Pump					
4	Vertical Turbine Well Pump	1	LS	$60,000.00	$60,000.00
5	New Piping and Controls	1	LS	$40,000.00	$40,000.00
6	Treatment System	2	LS	$25,000.00	$50,000.00
				SUBTOTAL:	$150,000.00
Construction Costs					
11	Mobilization	10.0%	LS		$15,350.00
Well Pipeline Connection					
	8" C-900 PVC Water Line Incl. Trenching and Fittings	50	LF	$55.00	$ 2,750.00
	10" C-900 PVC Water Line Incl. Trenching and Fittings	1,045	LF	$65.00	$ 67,925.00
	8" Ductile Iron Gate Valve (Resilient Seat)	2	EA	$1,500.00	$ 3,000.00
	10" Ductile Iron Gate Valve (Resilient Seat)	3	EA	$2,000.00	$ 6,000.00
	Connection to Existing Water Line	2	EA	$2,000.00	$ 4,000.00
	Remove and Replace Unsuitable Soils (15% of trench line)	110	CY	$30.00	$ 3,285.00
	Demo Existing Roadway	2,933	SY	$6.00	$ 17,600.00
	3" Thick HMA Roadway (24' Width)	2,933	SY	$9.00	$ 26,400.00
	3" CSTC	244.44	CY	$32.00	$ 7,822.22
	Mobilization (10%)	1	LS	$13,878.22	$ 13,878.22
				SUBTOTAL:	$ 152,660.44
				Cost Per Foot:	$ 139.42
				Construction Estimate Subtotal:	$321,510.44
				20% Construction Contingency	$64,302.09
				10% Geotechnical & Engineering Design Fee	$32,151.04
				Total	$417,963.58
	Estimated Total Project Cost				**$417,963.58**

THIS ESTIMATE EXCLUDES:

Cost of Permits / Fees
Tax
Rock Excavation
Hydrant Replacement
Unsuitable Soils

Assumptions

Gate valves were placed every 400 feet and rounded up
Road width was assumed to be 24' everywhere
Every replaced valve was assumed to be located at a connection to existing

Engineer's Opinion of Preliminary Project Costs
City of Clark Fork CIP - Storage Upgrades

Prepared By: Tom Jordan
Date: 11/20/2018

ITEM	DESCRIPTION	QTY	UNIT	EST. UNIT PRICE		EST. TOTAL COST
Storage: Adjacent to existing Tank						
	Cast In Place Concrete Tank	212,000	GAL	$1.75	$	371,000.00
	Mobilization (10%)	1	LS	$42,100.00	$	42,100.00
	Site Work	1	LS	$ 50,000.00	$	50,000.00
				SUBTOTAL:	$	463,100.00
Tank Pipeline Connection						
	8" C-900 PVC Water Line Incl. Trenching and Fittings	394	LF	$55.00	$	21,670.00
	10" C-900 PVC Water Line Incl. Trenching and Fittings	1,760	LF	$65.00	$	114,400.00
	8" Ductile Iron Gate Valve (Resilient Seat)	3	EA	$1,500.00	$	4,500.00
	10" Ductile Iron Gate Valve (Resilient Seat)	4	EA	$2,000.00	$	8,000.00
	Connection to Existing Water Line	2	EA	$2,000.00	$	4,000.00
	Remove and Replace Unsuitable Soils (15% of trench line)	215	CY	$30.00	$	6,462.00
	Demo Existing Roadway	2,933	SY	$6.00	$	17,600.00
	3" Thick HMA Roadway (24' Width)	2,933	SY	$9.00	$	26,400.00
	3" CSTC	244.44	CY	$32.00	$	7,822.22
	Mobilization (10%)	1	LS	$21,085.42	$	21,085.42
				SUBTOTAL:	$	231,939.64
				Cost Per Foot:	$	107.68
				Construction Estimate Subtotal:	$	695,039.64
				20% Construction Contingency	$	139,007.93
				10% Engineering Design Fee	$	69,503.96
				Total	$	903,551.54
	Estimated Total Project Cost				**$**	**903,551.54**

THIS ESTIMATE EXCLUDES:

- Cost of Permits / Fees
- Tax
- Rock Excavation
- Hydrant Replacement
- Unsuitable Soils

Assumptions

- Gate valves were placed every 400 feet and rounded up
- Road width was assumed to be 24' everywhere
- Every replaced valve was assumed to be located at a connection to existing

Engineer's Opinion of Preliminary Project Costs
City of Clark Fork CIP Pipe Replacement

Prepared By: Tom Jordan
Date: 11/20/2018

ITEM	DESCRIPTION	QTY	UNIT	EST. UNIT PRICE	EST. TOTAL COST
North Side Replacement					
	6" C-900 PVC Water Line Incl. Trenching and Fittings	7,088	LF	$45.00	$318,960.00
	8" C-900 PVC Water Line Incl. Trenching and Fittings	4,193	LF	$55.00	$230,615.00
	10" C-900 PVC Water Line Incl. Trenching and Fittings	1,476	LF	$65.00	$95,940.00
	6" Ductile Iron Gate Valve (Resilient Seat)	18	EA	$1,200.00	$21,600.00
	8" Ductile Iron Gate Valve (Resilient Seat)	10	EA	$1,500.00	$15,000.00
	10" Ductile Iron Gate Valve (Resilient Seat)	4	EA	$2,000.00	$8,000.00
	Connection to Existing Water Line	32	EA	$2,000.00	$64,000.00
	Remove Existing Water Line	12,757	LF	$3.00	$38,271.00
	Remove and Replace Unsuitable Soils (15% of trench line)	1,276	CY	$30.00	$38,271.00
	Demo Existing Roadway	34,019	SY	$6.00	$204,112.00
	3" Thick HMA Roadway (24' Width)	34,019	SY	$9.00	$306,168.00
	3" CSTC	2,834.89	CY	$32.00	$90,716.44
	Mobilization (10%)	1	LS	$143,165.34	$143,165.34
				Construction Contingency (20%)	$314,963.76
				Engineering Fee (10%)	$157,481.88
				Total This Option:	$2,047,264.43
				Cost Per Foot:	$160.48
South Side Replacement					
	6" C-900 PVC Water Line Incl. Trenching and Fittings	10,315	LF	$45.00	$464,175.00
	8" C-900 PVC Water Line Incl. Trenching and Fittings	1,403	LF	$55.00	$77,165.00
	6" Ductile Iron Gate Valve (Resilient Seat)	26	EA	$1,200.00	$31,200.00
	8" Ductile Iron Gate Valve (Resilient Seat)	4	EA	$1,500.00	$6,000.00
	Connection to Existing Water Line	30	EA	$2,000.00	$60,000.00
	Remove Existing Water Line	11,718	LF	$3.00	$35,154.00
	Remove and Replace Unsuitable Soils (15% of trench line)	1,172	CY	$30.00	$35,154.00
	Demo Existing Roadway	31,248	SY	$6.00	$187,488.00
	3" Thick HMA Roadway (24' Width)	31,248	SY	$9.00	$281,232.00
	3" CSTC	2,604.00	CY	$32.00	$83,328.00
	Mobilization (10%)	1	LS	$126,089.60	$126,089.60
				Construction Contingency (20%)	$277,397.12
				Engineering Fee (10%)	$138,698.56
				Total This Option:	$1,803,081.28
				Cost Per Foot:	$153.87

THIS ESTIMATE EXCLUDES:

Cost of Permits / Fees
Tax
Rock Excavation
Hydrant Replacement
Unsuitable Soils

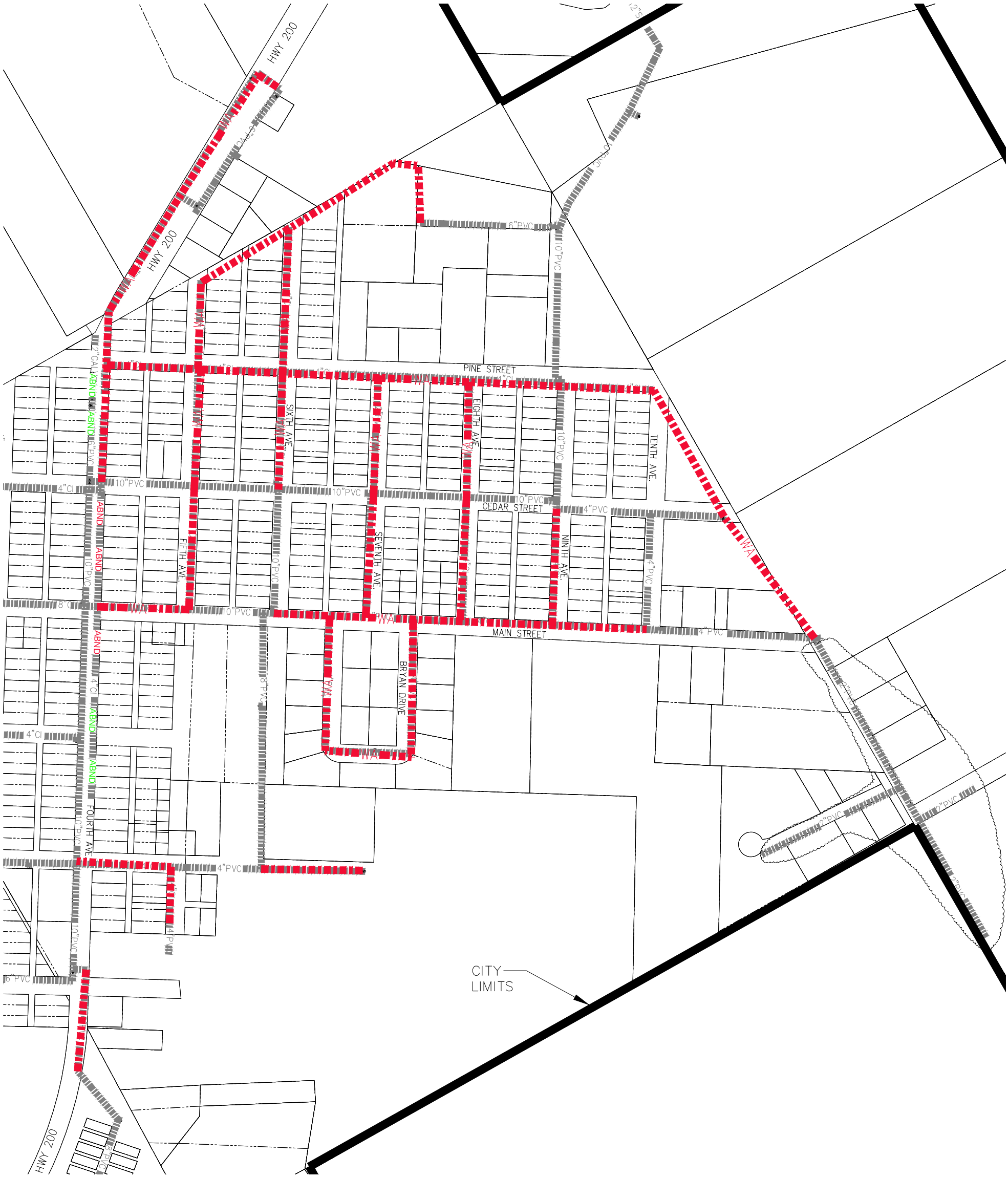
Assumptions

Gate valves were placed every 400 feet and rounded up
Road width was assumed to be 24' everywhere
Every replaced valve was assumed to be located at a connection to existing

LEGEND

PIPE SIZE AND MATERIAL

4"CI	EXISTING PIPE
ABND 4"CI ABND	EXISTING PIPE TO BE ABANDONED IN PLACE
WA	PIPE TO BE REPLACED
WA	NEW PIPE



TOTAL LINEAR FOOTAGE OF PIPELINE TO BE REPLACED/LOOPED NORTH SIDE = 12,757 FT
APPROXIMATE COST = $2,000,000 AT $160/FT WITH 24' HMA ROAD REPLACEMENT

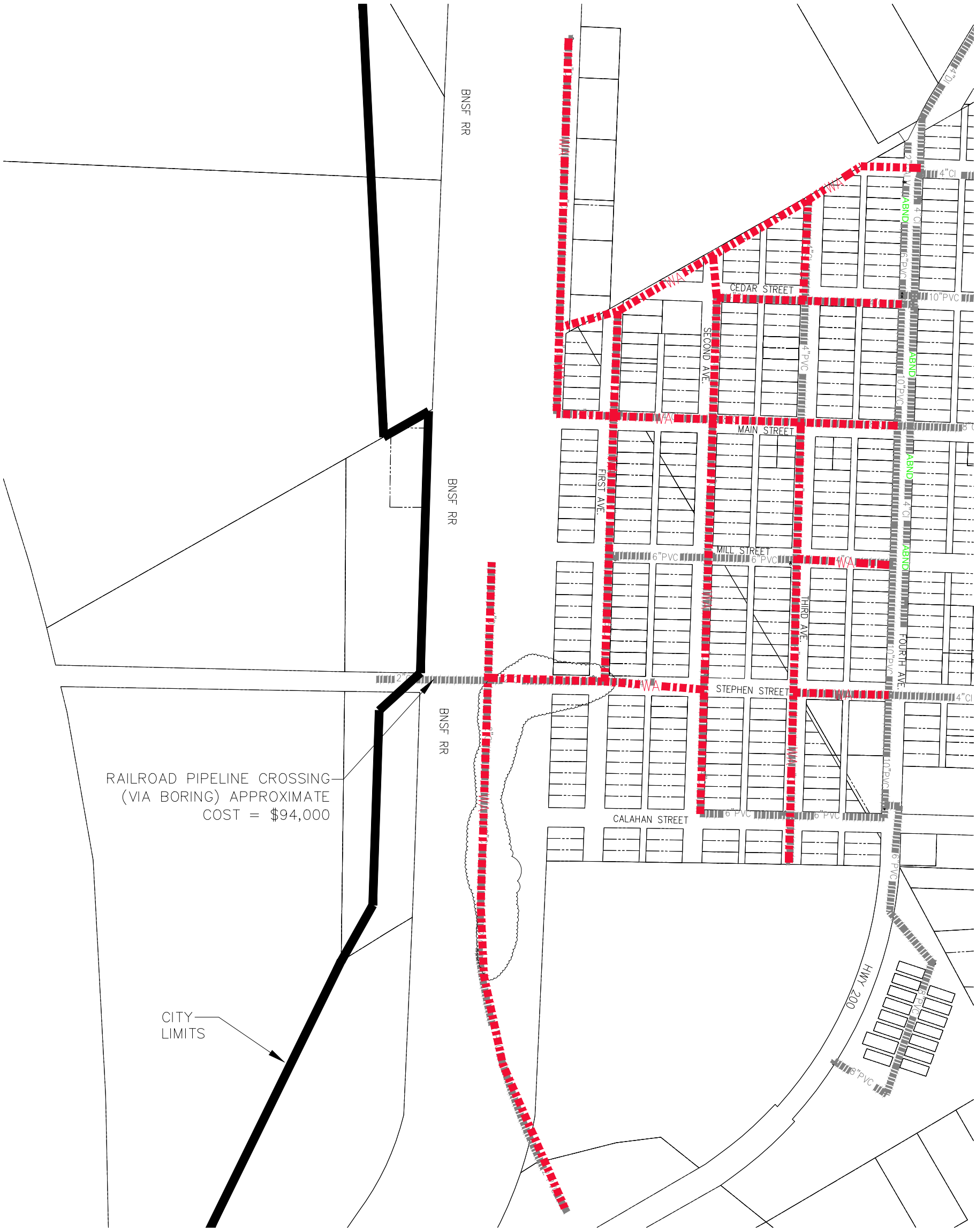
Parametrix
ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES
106 W MISSION AVENUE | SPOKANE, WA 99201
P 509.328.3371
WWW.PARAMETRIX.COM

CLARK FORK NORTH SIDE PIPE REPLACEMENT AND LOOPING

LEGEND

PIPE SIZE AND MATERIAL

4"CI	EXISTING PIPE
ABND 4"CI ABND	EXISTING PIPE TO BE ABANDONED IN PLACE
WA	PIPE TO BE REPLACED
WA	NEW PIPE



TOTAL LINEAR FOOTAGE OF PIPELINE TO BE REPLACED/LOOPED SOUTH SIDE = 11,718 FT
APPROXIMATE COST = $1,800,000 AT $153/FT WITH 24' HMA ROAD REPLACEMENT

NORTH

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CLARK FORK SOUTH SIDE PIPE REPLACEMENT AND LOOPING

LEGEND

PIPE SIZE AND MATERIAL

4"CI — EXISTING PIPE

ABND 4"CI ABND — EXISTING PIPE TO BE ABANDONED IN PLACE

WA — PROPOSED PIPE

PROPOSED 0.2MG WATER TANK W/ ASSOCIATED PIPELINE FOR REROUTING MAIN ~$1,000,000

EXISTING WATER TANK SITE

REHABILITATED 9TH ST WELL SITE AND PIPELINES ~$500,000

ABND 12"S

ABND

WA

10"PVC

6"PVC

LIGHTNING CREEK

HWY 200

CITY LIMITS

UTILIZE INFRASTRUCTURE IN PLACE UNDER BRIDGE FOR WATER LINE INSTALLATION

6TH AVE 4"CI

5TH AVE 4"CI

4"DI

2"

NORTH

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P 509.328.3371
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9TH STREET WELL REHABILITATION, PIPELINE INSTALLATION AND NEW WATER TANK

LEGEND

PIPE SIZE AND MATERIAL

4"CI — EXISTING PIPE

ABND 4"CI ABND — EXISTING PIPE TO BE ABANDONED IN PLACE

WA — PROPOSED PIPE

ABND

WA

12"S

NEW WATER TANK

EXISTING WATER TANK SITE

LIGHTNING CREEK

REHABILITATED 9TH ST WELL SITE

9TH AVE WELL TREATMENT PLANT

10"PVC

6"PVC

HWY 200

CITY LIMITS

4"DI

6TH AVE

4"CI

5TH AVE

2"

NORTH

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WWW.PARAMETRIX.COM

9TH STREET WELL TREATMENT PLANT

Appendix F-3

Funding Agency Contacts

Idaho Water and Wastewater Funding Sources

Compiled by the Environmental Finance Center Network, May 2016

Organization	Program *(key words)*	Purpose or Use of Funds	How to Apply	Website	Contact
Idaho Department of Environmental Quality	Drinking Water State Revolving Fund (SRF) *(water)*	The State Revolving Fund (SRF) program to assist public water systems to finance the cost of the infrastructure needed to achieve or maintain compliance with SDWA requirements and protect public health.	Potential candidates must submit a Letter of Interest (LOI) to DEQ indicating their desire for DEQ funding and stating the improvements or expansion needed. Those systems that submit LOIs are eligible for placement on the state's priority list.	https://www.deq.idaho.gov/water-quality/grants-loans/water-system-construction-loans/	Tim Wendland Tim.Wendland@deq.idaho.gov 208-373-0439 1410 North Hilton Boise, Idaho 83706
	Clean Water State Revolving Fund (SRF) *(sewer)*	The Clean Water State Revolving Fund program is a funding program to address water quality problems through wastewater facility construction, upgrades, or expansions. The program is charged with general oversight, fiscal management and administrative compliance review of local governmental entities that receive funds.		https://www.deq.idaho.gov/water-quality/grants-loans/wastewater-system-construction-loans/	
USDA Rural Development	Waste and Water Disposal Direct Loans and Grants *(water, sewer)*	The purpose of this program is to develop water and waste disposal systems in rural areas with populations less than 10,000. Fixed, low interest rates. Repayment - up to 40 years. Grants may be available.	Applications are accepted on a rolling basis. Paper applications are accepted, or applicants can register for and use RD Apply. Information is available here: http://www.rd.usda.gov/programs-services/rd-apply	http://www.rd.usda.gov/programs-services/water-waste-disposal-loan-grant-program/id	David Flesher david.flesher@id.usda.gov 208-378-5617 9173 West Barnes, Suite A1 Boise, Idaho 83709
	Water and Waste Disposal Guaranteed Loan Program *(water, sewer)*	The purpose of this program is to provide a loan guarantee for the construction or improvement of water and waste disposal projects serving the financially needed communities of rural areas. This is achieved through bolstering existing private credit structure through the guarantee of quality loans. Guarantees up to 90% available to eligible lenders.		http://www.rd.usda.gov/programs-services/water-waste-disposal-loan-guarantees/id	
	Water & Waste Disposal Predevelopment Planning Grants *(water , wastewater)*	This program assists low-income communities with initial planning and development of an application for USDA Rural Development Water and Waste Disposal direct loan/grant and loan guarantee programs. The maximum is $30,000 or 75% of the predevelopment planning costs.		http://www.rd.usda.gov/programs-services/water-waste-disposal-predevelopment-planning-grants/id	
	Emergency Community Water Assistance Grants *(water)*	This grant program is designed to assist rural communities that have experienced a significant decline in quantity or quality of drinking water due to an emergency, or in which such decline is considered imminent, to obtain or maintain adequate quantities of water that meets the standards set by the Safe Drinking Water Act.		http://www.rd.usda.gov/programs-services/emergency-community-water-assistance-grants/id	
Economic Development Administration, Department of Commerce	Public Works *(water, sewer)*	Empowers distressed communities to revitalize, expand, and upgrade their physical infrastructure, and generate or retain long-term, private sector jobs and investment.	Application packages are available at www.grants.gov. Applications will be accepted on an ongoing basis until the publication of a new EDAP FFO.	https://www.eda.gov/funding-opportunities/	David Farnworth-Martin dfarnworth-martin@eda.gov 206-220-7699 915 Second Avenue, Room 1890 Seattle, Washington 98174
	Economic Adjustment *(water, sewer)*	Assists state and local interests in designing and implementing strategies to adjust or bring about change to an economy. The program focuses on areas that have experienced or are under threat of serious structural damage to the underlying economic base.			

Idaho Water and Wastewater Funding Sources

Compiled by the Environmental Finance Center Network, May 2016

Organization	Program *(key words)*	Purpose or Use of Funds	How to Apply	Website	Contact
National Rural Water Association	NRWA Revolving Loan Fund *(water, wastewater)*	The Rural Water Loan Fund (RWLF) is a funding program specifically designed to meet the unique needs of small water and wastewater utilities. The RWLF provides low-cost loans for short-term repair costs, small capital projects, or pre-development costs associated with larger projects. The RWLF was established through a grant from the USDA/RUS, and repaid funds used to replenish the fund and make new loans.	Applications can be accessed on website. Applications and supporting documents can be sent by mail or email.	http://nrwa.org/initiatives/revolving-loan-fund/	Shelley Roberts sroberts@idahoruralwater.com 208-343-7001 6065 West Corporal Lane Boise, Idaho 83704
Rural Community Assistance Partnership (RCAP)	Communities Unlimited Water/Wastewater Loans *(water, wastewater)*	Communities Unlimited offers loans with terms up to 15 years for small, rural community water/wastewater projects. Loans enable rural communities to make the necessary repairs and improvements needed to maintain an uninterrupted supply of safe drinking water and wastewater disposal for their customers.	Applications are accepted on a rolling basis. Please contact the Lending Department to request an application.	https://www.communitiesu.org/index.php/How-We-Help/water-waste-water-loans.html	Holly Baker hbaker@crg.org 479-443-2700 ext. 114 3 East Colt Square Drive Fayetteville, Arkansas 72703
	Rural Community Assistance Corporation (RCAC) Environmental Infrastructure Loans *(water, wastewater)*	RCAC provides loans to finance water and waste facility projects. RCAC's loan programs are unique — they provide the early funds that small rural communities need to determine feasibility and pay pre-development costs prior to receiving state and federal program funding.	Applications can be accessed on the website and sent to the loan officer serving your state. Applications are accepted on a rolling basis.	http://www.rcac.org/lending/environmental-loans/	Chuck Miller cmiller@rcac.org 360-253-7683 *or* Michael Carroll mcarroll@rcac.org 916-447-9832 ext. 1003 3120 Freeboard Drive, Suite 201 West Sacramento, California 95691
CoBank	Rural Water and Wastewater Lending *(water, wastewater)*	CoBank works with rural water and wastewater not-for-profit systems, municipalities, and investor-owned utility companies to provide interim and bridge financing, refinance of existing debt, term loans for system upgrades, and lines of credit.	Applications are accepted continuously. To apply, complete an online Loan Request Form at: www.cobank.com/h2oloan	http://www.cobank.com/About-CoBank/Industries-We-Serve/Water.aspx	Mark Shillingford Water@cobank.com 844-846-3135 6340 South Fiddlers Green Circle Greenwood Village, Colorado 80111
Idaho Department of Commerce	Community Development Block Grant Program (CDBG) *(water, sewer)*	The Idaho Community Development Block Grant program (ICDBG) assists Idaho cities and counties with the development of needed public infrastructure. The program is administered by Idaho Department of Commerce, Division of Economic Development, with funds received annually from the U.S. Department of Housing and Urban Development.	Applications can be accessed on website. Please address any questions you may have regarding the ICDBG application process to your regional staffer.	http://commerce.idaho.gov/development-block-grants/	Dennis Porter dennis.porter@commerce.idaho.gov 208-334-2470 700 West State Street, PO Box 83720 Boise, Idaho 83720

Appendix G-1

Public Meeting Minutes

Minutes of the 3/13/2017 Regular Clark Fork City Council Meeting

Mayor Russell Schenck called the March 13, 2017 Regular Meeting of the City Council to order at 7:00 p.m. in the Clark Fork City Hall, 110 East Third Avenue.

Mayor Schenck led the Pledge of Allegiance.

Roll Call of Council Members: Council Members Shari Jones, Stanley Spanski and Harold Hilton were present constituting a quorum. Council Member Blaine Williams was absent.

ADDITIONS to the AGENDA: No.

CONSENT AGENDA:

- Minutes: Regular Council Meeting February 13, 2017
- Purchase Orders
- Payment of City Bills in the amount of 14,346.26

Council Member Hilton moved to approve the Consent Agenda. Council Member Jones seconded the motion. All in favor. Motion carried.

New Business

A. Water Study Update

KJ from Parametrix came in and discussed overview update, the modification's set by the City and also set up a workshop on April 3, 2017 at 6pm to go over planning for the future for the water projects and answer any questions Council comes up with.

B. Discuss State of the County with Sheriff Darryl Wheeler

Wheeler came in and gave a presentation on Community Neighborhood Watch Program and discussed the statistics for the year with how many people got arrested, people that got pulled over in the City of Clark Fork, and people that got citations. Wheeler also wanted to inform us that there will be a Peace Officer Memorial Service on May 15th at 5:30pm at the Bonner County Sheriff's office and a Community Watch Meeting at the Clark Fork Senior Center on March 29th and welcomes everyone to participate in both meetings.

C. Discuss Special Permit Issuance Agreement and Resolution.

Mayor Schenck discussed that the State is going to be allowing extra heavy loads and long trucks on certain highways. State wanted all entities and permits to allow them to write permits for the City and ITD said that would be fine. The City does not have jurisdiction over Highway 200 just the city streets in city limits. ITD would like Council to sign the agreement, and send in Resolution 1-2017 which means City will not designate any routes in the City limits. This allows City to make decisions on big loads coming through City streets.

Council Member Hilton moved to approve the Special Permit Issuance Agreement with ITD for the operation of overweight and over length vehicles Council Member Jones seconded the motion. No roll call vote was made. All approved. Motion Carried.

Roll Call vote of Council Members:
Blaine Williams – A
Harold Hilton – Y
Stanley Spanski – Y

Shari Jones - Y
Motion carried.

D. FLAP Grant Application

FLAP means Federal Lands Access Program. Mayor Schenck discussed with Council that there is funding available with a 7.3 percent grant match to fix city streets. The grant application is due at the end of March but Council decided to wait until next year's funding cycle.

E. Discuss Fatbeam Proposal

The Fatbeam proposal is a Limited Right of Way Use Agreement as oppose to a Franchise Agreement. Mayor Schenck and Chris Jasper decided to go an alternate route beginning at the power pole on southwest side of intersection of State Highway 200 (4th Ave.) and Pine St, then Northeast for 2 blocks to Sixth Ave, then Southeast 2 blocks to Main St, then Southwest ½ block to entrance to school property where ROW access is terminated. Council decided to charge Fatbeam an annual fee of $1000 dollars. The contract starts when both parties agree and that day shall be when payment is received. Council Member Hilton moved to approve The Fatbeam proposal with a $1000 dollar annual fee for the service. Council Member Jones seconded the motion. Roll call vote was made. All approved.
Roll Call vote of Council Members:
Blaine Williams – A
Harold Hilton – Y
Stanley Spanski – Y
Shari Jones - Y
Motion carried.

Council Member Jones moved to adjourn. Council Member Hilton seconded the motion. Motion carried. The meeting adjourned at 8:36 p.m.

Respectfully Submitted,

_____ _____

Amber Burgess, City Clerk/Treasurer Russell Schenck, Mayor

Minutes of the 6/16/2016 Regular Clark Fork City Council Meeting

Mayor Chris Riggins called the June 16, 2016 Regular Meeting of the City Council to order at 7:00 p.m. in the Clark Fork City Hall, 110 East Third Avenue.

Mayor Riggins led the Pledge of Allegiance.

Roll Call of Council Members: Council Members Russell W. Schenck, Stanley Spanski, and Harold Hilton were present constituting a quorum.

ADDITIONS to the AGENDA: No.

CONSENT AGENDA:

- Minutes: Regular Council Meeting May 9, 2016
- Purchase Orders
- Payment of City Bills in the amount of $11,068.42

Council Member Schenck moved to approve the Consent Agenda with the exception of the irrigation system purchase order. Council Member Hilton seconded the motion. All in favor. Motion carried.

New Business:

A. Appoint new Council Member.

Council Member Schenck moved to approve the appointment of new Council Member Blaine Williams to replace Council Member Sharon Jeffers for the rest of her term. Council Member Hilton seconded the motion.
Roll Call vote of Council Members:
Russell Schenck – Y
Harold Hilton – Y
Stanley Spanski – Abstain
Motion carried.

The City Clerk Nina Riggins had the newly appointed Council Member Blaine Williams take the "Oath of Office" for the position mentioned above and presented him with a Certificate of Appointment.

B. Discuss Conditional Use Permit for Kelly's Bar & Grill.

Council listened to City Attorney John Cafferty explain the legal reasoning of why Kelly's Bar & Grill does not have a Conditional Use Permit and why it was not discussed during the last Regular Council Meeting. The City Attorney also explained the legal actions available to Citizen John Carr who wrote one of the letters complaining of noise and additional issues with the establishment.

C. Discuss Water System Study with KJ of Parametrix.

KJ of Parametrix presented his 50% preliminary review of the City's Water System Study to Council and discussed options along with potential prices for replacement. Council set date for Water System Study Workshop for July 18, 2016 at 6:00pm to continue discussing this item.

D. Discuss bids for removal of trees at 103 Stephen St.

Council did not discuss this item because the trees are already being taken down by Avista.

E. Discuss culvert/drywell prices for Stephen St.

Council Member Schenck moved to approve the listed price of the drywell for Stephen St. Council Member Hilton seconded the motion.
Roll Call vote of Council Members:

Russell Schenck – Y
Blaine Williams – Y
Harold Hilton – Y
Stanley Spanski – Y
Motion carried.

F. Discuss Catering & Fireworks Display permits for Fourth of July.

Council Member Schenck moved to approve the Liquor Catering & Fireworks Display permits from the Rod & Gun Club for Fourth of July. Council Member Hilton seconded the motion.
Roll Call vote of Council Members:
Russell Schenck – Y
Blaine Williams – Y
Harold Hilton – Y
Stanley Spanski – Y
Motion carried.

G. Discuss Audit Engagement Letter from Anderson Bros CPA.

Council Member Schenck moved to approve the Audit Engagement Letter from Anderson Bros CPA. Council Member Williams seconded the motion.
Roll Call vote of Council Members:
Russell Schenck – Y
Blaine Williams – Y
Harold Hilton – Y
Stanley Spanski – Y
Motion carried.

Council Member Schenck moved to adjourn. Council Member Hilton seconded the motion. Motion carried.
The meeting adjourned at 8:40 p.m.

Respectfully Submitted,

_____ _____

Amber Burgess, City Clerk/Treasurer Chris Riggins, Mayor

City of Clark Fork

Minutes of the 6/05/2017 Special Clark Fork City Council Meeting

Mayor Russ Schenck called the June 5, 2017 Special Meeting of the City Council to order at 6:02 p.m. in the Clark Fork City Hall, 110 East Third Avenue.

Mayor Schenck led the Pledge of Allegiance.

Roll Call of Council Members: Council Members Shari Jones, Harold Hilton, Blaine Williams were present constituting a quorum. Stan Spanski was absent.

ADDITIONS to the AGENDA: No.

Agenda:

A. Void from C & D from May 5, 2017 Agenda based upon conflict of Mayor

Mayor Russell Schenck explained to council that he wasn't allowed to be involved to discuss items C & D because of the conflict of interest and, asked council to have those 2 items voided.

Council Member Jones made a motion to void items C & D from May 5th, 2017 Agenda due to conflict of Mayor. Council Member Williams seconded the motion.
Roll Call vote of Council Members:
Shari Jones – Y
Blaine Williams – Y
Harold Hilton – Y
Stanley Spanski – A
Motion carried.

Mayor Russell Schenck removed himself from the body to avoid conflict of interests. Council President Hilton will conduct the meeting as Mayor Pro- Tem for Items B, C & D.

B. Discuss Addressing for Russell Schenck

Council Member Williams made a motion to approve two addresses, one for Russell Schenck with the address of 1111 N. Main and 1109 N. Main for adjacent vacant lot. Council Member Jones seconded the motion.
Roll Call vote of Council Members:
Shari Jones – Y
Blaine Williams – Y
Harold Hilton – Y
Stanley Spanski – A
Motion carried.

C. Discuss Setback for Modular Home for Russell Schenck

Council Member Williams moved to approve setback permit for modular home for Russell Schenck on address 1111 N. Main. Council Member Jones seconded the motion.
Roll Call vote of Council Members:
Shari Jones – Y
Blaine Williams – Y
Harold Hilton – Y
Stanley Spanski – A
Motion carried.

D. Discuss Setback for Boat Building for Russell Schenck

Council Member Williams moved to approve setback permit for Boat Building for Russell Schenck on address 1111 N. Main. Council Member Jones seconded the motion.
Roll Call vote of Council Members:
Shari Jones – Y
Blaine Williams – Y
Harold Hilton – Y
Stanley Spanski – A
Motion carried.

Mayor Schenck retook his seat with Council to conduct the remainder of the meeting.

E. Budget Workshop

Council discussed Water Section of budget.

MOTION TO ADJOURN

Council Member Williams moved to adjourn. Council Member Jones seconded the motion. All in favor. Motion carried. The meeting adjourned at 8:11p.m.

Respectfully Submitted,

_____ _____

Amber Burgess, City Clerk/Treasurer Russell Schenck, Mayor

City of Clark Fork

Minutes of the 7/25/2016 Special Clark Fork City Council Meeting

Mayor Chris Riggins called the July 25, 2016 Special Meeting of the City Council to order at 6:00 p.m. in the Clark Fork City Hall, 110 East Third Avenue.

Mayor Riggins led the Pledge of Allegiance.

Roll Call of Council Members: Council Members Russell W. Schenck, Harold Hilton, and Stanley Spanski were present constituting a quorum. Council Members Blaine Williams was absent.

ADDITIONS to the AGENDA: No.

Agenda:

A. Water System Study Workshop.

KJ for Parametrix discussed with Council the general summary of the City's water system, system improvements needed, estimates for cost on replacement of the system, and potential funding.

Adjournment: Council Member Hilton moved to adjourn. Council Member Schenck seconded the motion. Motion carried. The meeting adjourned at 7:07 p.m.

Respectfully submitted,

_____ _____

Amber Burgess, City Clerk/Treasurer Chris Riggins, Mayor