CITY OF NORTH BONNEVILLE

SKAMANIA COUNTY, WASHINGTON

WATER SYSTEM PLAN

G&O No. 11241
January 2013

Gray & Osborne, Inc.
CONSULTING ENGINEERS

CITY OF NORTH BONNEVILLE

SKAMANIA COUNTY **WASHINGTON**

WATER SYSTEM PLAN

KENNETH C. ALEXANDER
STATE OF WASHINGTON
30026
REGISTERED
PROFESSIONAL ENGINEER

1-22-2013

MALLORY LYNN TAYLOR
STATE OF WASHINGTON
40026
REGISTERED
PROFESSIONAL ENGINEER

1-22-2013

G&O #11241
JANUARY 2013

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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INTRODUCTION

The City of North Bonneville has prepared water system planning document to meet the provisions of WAC 246-290-100.

Per Chapter 246-290-100(1) WAC, this plan is required for the following reasons:

1. Demonstrate the City of North Bonneville water system's operational, technical, managerial, and financial capability to achieve and maintain compliance with relevant local, state, and federal plans and regulations.

2. Demonstrate how the City of North Bonneville water system will address present and future needs in a manner consistent with other relevant plans and local, state, and federal laws, including applicable land use plans.

3. Establish eligibility for funding of water system improvements per Chapter 246-296 WAC.

In accordance with the WAC, water system plans must be updated every 6 years. Analysis of a water system's capabilities must be done on both a 6-year and 20-year planning period. The 6-year planning period should address issues and system deficiencies that have a health and safety impact. The 20-year planning period addresses issues and system deficiencies that are likely to become more pertinent future planning efforts.

WATER SYSTEM DESCRIPTION

The City of North Bonneville operates a water system consisting of one well, a gas chlorination disinfection system, sodium silicate treatment, two reservoirs, and a distribution system. The City has no interties with adjacent purveyors.

The City has water rights associated with its groundwater source that are summarized in Table 1.

TABLE E-1

City of North Bonneville Water Rights

Source	Certificate Number	Priority Date	Maximum Instantaneous Withdrawal	Maximum Annual Withdrawal [(1)]
Well 1 (SO1)	G2-24064C	February 11, 1976	1,000 gpm	336 acre-feet per year

PLANNING DATA

The City is required to document historical water demands and forecast future water demands in order to demonstrate the adequacy of its water system. Water demand forecasting requires an assessment of the City's growth patterns and past water usage patterns as well as lost and unaccounted for water.

As shown in Table 2, the average annual growth rate within the City over the last 10 years was 5.2 percent. Skamania County expects a varied growth rate between 0.74 and 1.24 percent. The City expects the actual growth within the city limits to lie between these rates, at a growth of 4.35 percent. A 4.35 percent population growth rate was used to forecast water demands through the 6- and 20-year planning periods as required by WAC 246-290-100. Table 3 summarizes City consumption, production and distribution system leakage.

TABLE E-2

City of North Bonneville Historical Population
2002 to 2011

Year	Population	Growth Rate
2002	627	7.0%
2003	615	-1.9%
2004	685	11.4%
2005	741	8.2%
2006	828	11.7%
2007	882	6.5%
2008	877	-0.6%
2009	880	0.3%
2010	880	0.0%
2011	965	9.7%
Average Annual Growth Rate		**5.2%**

TABLE E-3

City of North Bonneville Distribution System Leakage

Year	Production (gallons)	Consumption (gallons)	DSL (gallons)	Percent DSL
2007	69,401,500	37,918,010	31,483,490	45.4%
2008	67,181,400	37,778,169	29,403,231	43.8%
2009	67,682,300	38,439,290	29,243,010	43.2%
2010	57,199,000	34,813,819	22,385,181	39.1%
2011	67,680,700	42,434,074	25,246,626	37.3%

The difference between metered production and metered consumption is nonrevenue water that has historically been termed as lost or unaccounted for water. Under the new Water Use Efficiency requirements, all lost and unaccounted for water is designated as distribution leakage. Table 6 summarizes distribution system leakage for the City of North Bonneville water utility. Under the Water Use Efficiency requirements, DOH has set a distribution system leakage standard of 10 percent. The City's distribution system leakage in the year 2011 was nearly 37 percent and has generally decreased over the last 6 years.

The City believes that the source water meter at the well may be contributing to high DSL. Additional sources of DSL are likely leaking water lines in the distribution system, and old water service meters.

A critical parameter for analyzing water system capacity is the Equivalent Residential Unit (ERU). Table 4 summarizes how the ERU was calculated for the City of North Bonneville water system. Table 5 shows the ERUs for each customer class within the City in 2011.

TABLE E-4

City of North Bonneville Metered Equivalent Residential Units

Year	Connections	Consumption (gpd)	ERU (gpd/ERU)
2007	277	71,393	258
2008	287	67,158	234
2009	287	66,912	233
2010	289	59,531	206
2011	290	76,793	265
Average	**286**	**68,357**	**239**

TABLE E-5

City of North Bonneville Year 2011 Equivalent Residential Units

Customer Class	Average Consumption (gpd)	Number of Connections	ERUs	Number of ERUs per Unit
Single-Family Residential	76,793	290	321	1.11
Multi-Family Residential	9,818	21	41	1.96
Municipal	24,922	7	104	14.89
Commercial	2,059	18	9	0.48
Industrial	2,665	8	11	1.39
Total	**116,258**	**344**	**486**	

(1) The City serves 95 multifamily units through 21 connections.
(2) Equal to the average consumption divided by the ERU value of 239 gpd/ERU in 2011.

DOH requires that water utilities forecast water demands based on average day, maximum day, and peak hour demands. Average day consumption and production forecasts are presented in Table 6 assuming that the distribution system leakage remains unchanged from 2011 levels.

The City has limited data necessary to forecast maximum day and peak hour demands. Water production data for the year 2011 was used to develop a peaking factor to predict maximum day demand. A peaking factor of 3.31 was determined based on the ratio of metered maximum day demand to average day demand. A DOH formula was used to calculate the peaking factor for peak hour demand as 1.99.

Table 7 summarizes each of these projected demands (average, maximum day and peak day) assuming the City's distribution system leakage remains unchanged from 2011 levels.

TABLE E-6

City of North Bonneville Projected Average Day Production through the Year 2032 Assuming Distribution System Leakage is Unchanged

Year	Consumption (gpd)	Production (gpd)
2012	121,300	193,500
2017	150,100	239,400
2032	284,300	453,400

TABLE E-7

City of North Bonneville Projected Average Day, Maximum Day, and Peak Hour Production Through Year 2032 Assuming Distribution System Leakage Is Unchanged

Year	Projected Average Day Production (gpd)	Projected Average Day Production (acre-ft/yr)	Projected Maximum Day Production (gpd)	Projected Maximum Day Production (gpm)	Projected Peak Hour Production (gpm)
2012	193,500	217	640,278	445	885
2017	239,400	268	792,158	550	1,095
2032	453,400	508	1,500,269	1,042	2,073

(1) Maximum day demand was projected by applying a peaking factor of 3.31.
(2) Peak hour demand was projected by applying a peaking factor of 1.99.

WATER SYSTEM ANALYSIS

SOURCE ANALYSIS

The capacity of the City's source was analyzed with respect to water rights and historical operating capacity. As shown in Table 1, the City has water rights totaling 1,000 gallons per minute (gpm) based on instantaneous withdrawal.

As shown in Table 8, the City has adequate water rights for average daily demand projections through 2022 and will require additional water rights within the 20-year planning period. As shown in Table 9, the City does not have adequate source capacity for projected maximum day demands if distribution system leakage remains unchanged. If the City reduces DSL to 10 percent by 2021, then the existing pumps at the well will meet maximum day demands through 2028. The pumps should be upgraded to 1,000 gpm if to meet maximum day demands if DSL cannot be reduced.

TABLE E-8

City of North Bonneville Projected Average Annual Withdrawal Water Rights Analysis

Year	Projected Annual Withdrawal (acre-ft/yr)	Maximum Annual Withdrawal Rate [1] (acre-ft/yr)	Water Rights Surplus (acre-ft/yr)
2012	232	450	119
2017	246	450	68
2022	332	336	4
2023	346	336	(10)
2028	508	336	(172)

TABLE E-9

City of North Bonneville Source Production Capacity Analysis No Reduction in Distribution System Leakage

Year	Maximum Day Production Capacity [1] (gpd)	Projected Maximum Day Production [2] (gpd)	Production Surplus/(Deficit) (gpd)
2012	864,000	640,278	223,722
2017	864,000	792,158	71,842
2032	864,000	1,500,269	(636,269)

STORAGE ANALYSIS

The City has two reservoirs: the Old and New Reservoirs. The reservoirs are in the same pressure zone and they are located next to each other and have the same dimensions.

Actual usable storage volume in the two reservoirs is based on the following storage volume components, which were analyzed for the City's two reservoirs in accordance with the DOH Water System Design Manual:

- Operational Storage (Vos)
- Equalizing Storage (Ves)
- Standby Storage (Vsb)
- Fire Suppression Storage (Vff)
- Dead Storage

Operational storage is based on the reservoir level set points in the reservoirs selected by the City for operating the wells. Equalizing storage is the amount of water needed to

meet peak system demand for a period of time that the system demand exceeds the system source capacity. Standby storage is water held in reserve for emergency situations, such as temporary loss of a water source, and is based on a DOH formula that takes into account the number of connections served by the water system. Fire flow storage is based on providing 1,000 gpm for 1 hour. DOH allows nesting of standby and fire flow storage if the local fire authority allows this. Dead storage is based on the volume in the reservoir that is not usable if a minimum system-wide pressure of 30 psi cannot be maintained under normal conditions, or 20 psi under fire flow conditions.

The City has adequate storage for the 6- and 20-year planning periods with the two existing reservoirs. Table 10 summarizes the reservoir storage analysis without nesting of standby and fire flow storage.

TABLE E-10

City of North Bonneville Water System Summary of Storage Analysis

Year	Vos (gal)	Ves (gal)	Vsb (gal)	Vff (gal)	Vtotal (1) (gal)	Available Storage	Surplus (gal)
2012	71,200	42,800	242,700	60,000	416,700	953,200	536,500
2017	71,200	74,300	300,200	60,000	505,700	953,200	447,500
2032	71,200	221,000	568,600	60,000	920,800	953,200	32,400

(1) Assumes a total available storage of 423,645 gallons for both reservoirs.

TREATMENT ANALYSIS

The water quality from the City's source is generally good and complies with primary drinking water standards established by EPA and DOH.

The City wishes to convert from chlorine gas to liquid sodium hypochlorite to mitigate safety and health issues associated with the continued use of chlorine gas. This will involve providing a drum of liquid sodium hypochlorite, a metering pump, and piping to replace the chlorine gas feed system.

DISTRIBUTION SYSTEM HYDRAULIC ANALYSIS

A computer-based hydraulic model was used to analyze the City's water distribution system to meet the following demands:

- 2011 Average Daily Demands: These demands were used while calibrating the model.

- 2017 Peak Hour Demands: These demands were used to verify the system is able to meet the DOH standards to supply domestic water at a minimum system-wide pressure of 30 psi within the 6-year planning period.

- 2017 Maximum Day Demands: These demands were used to evaluate the system's ability to meet the maximum day demands plus required fire flows at DOH's requirement of 20 psi within the 6-year planning period. Fire flow standards are defined as 1,000 gpm within the city limits and 1,500 gpm at the Port.

- 2032 Peak Hour Demands: These demands were used to verify the system is able to meet the DOH standards to supply domestic water at a minimum system-wide pressure of 30 psi within the 20-year planning period.

- 2032 Maximum Day Demands: These demands were used to evaluate the system's ability to meet the maximum day demands plus required fire flows at DOH's requirement of 20 psi within the 20-year planning period.

Under 2032 peak hour demand conditions, the system is capable of meeting the minimum pressure requirements. Under 2032 maximum day demand conditions, the system is capable of meeting the minimum fire flow requirements.

CAPITAL IMPROVEMENT PLAN

The following table summarizes water system deficiencies, provides preliminary cost estimates, and proposes a schedule for correcting each deficiency.

TABLE E-11

City of North Bonneville Water System Timeline of Correcting Deficiencies

No.	Title	Year	Project Cost
Capital Improvements 2012-2017			
TR-1	Sodium Hypochlorite Disinfection System	2012	$15,000
P-1	Update Water System Plan	2012	$20,000
D-1	Leak Detection Survey	2012	$5,000
SO-1	Source Meter Evaluation	2013	$15,000
M-1	Meter Replacement Program	2013	$7,800
SO-2	Intertie Negotiations	2013	$15,000
SO-3	Apply for Additional Water Rights	2013	$10,000
SO-4	Hydrogeologic Investigation	2013	$50,000
D-2	Distribution System Improvements	2013	$50,000
SO-5	Design and Engineering for Additional Well Source	2014	$167,000
M-1	Meter Replacement Program	2014	$7,800
D-2	Distribution System Improvements	2015	$50,000
M-1	Meter Replacement Program	2016	$7,800

TABLE E-11 – (continued)

City of North Bonneville Water System Timeline of Correcting Deficiencies

No.	Title	Year	Project Cost
SO-6	Construction of Additional Well Source	2017	$668,000
D-2	Distribution System Improvements	2017	$50,000
6-Year Capital Improvement Total			**$1,138,400**
Capital Improvements 2018-2032			
SO-7	Well No. 1 Capacity Upgrade	2018	$141,000
D-3	Reservoir Transmission Main Replacement	2018	$605,000
SO-8	Telemetry Upgrades for Existing Well	2019	$95,000
D-2	Distribution System Improvements	2019	$50,000
P-2	Update Water System Plan	2019	$35,000
D-2	Distribution System Improvements	2024	$50,000
ST-1	Repaint Old Reservoir - Welded Steel	2026	$215,000
D-2	Distribution System Improvements	2029	$50,000
20-Year Capital Improvement Total			**$1,241,000**
Complete Capital Improvement Total			**$2,379,400**

Note – All costs are in 2012 dollars.

CHAPTER 1

WATER SYSTEM DESCRIPTION

INTRODUCTION

In accordance with Washington Administrative Code (WAC) 246-290-100 and the Washington State Department of Health (DOH), water system plans need to be updated every 6 years or more frequently, if necessary, to reflect the current conditions of the water system.

This Plan has been prepared in accordance with WAC 246-290. The City's most recently updated Water System Plan, recognized and approved by the Washington State Department of Health, was from 1998. This Plan is being prepared in order to meet current DOH requirements within WAC 246-290-100.

Primary references employed to prepare this Plan include the 1998 Water System Plan and General Sewer Plan for the City of North Bonneville; the DOH Water System Design Manual, December 2009; the DOH Water Use Efficiency Guidebook, January 2011 and the DOH Water System Planning Handbook, April 1997.

The purpose of this Plan is to assist the City of North Bonneville (City) in developing long term planning strategies. The Plan that follows evaluates the existing water system and its ability to meet the anticipated State and Federal requirements for water source, quality, transmission, distribution, and storage. This Plan evaluates the system capacity into the 6 and 20 year planning periods, 2017 and 2032 respectively.

The City of North Bonneville is located in Skamania County on the north shore of the Columbia River, about 40 miles east of the City of Vancouver. Located along State Route 14, the Burlington Northern Railroad passes through the City. The City of North Bonneville grew from the construction of the Bonneville Dam and was incorporated in 1935. Between 1971 and 1978 the Corps of Engineers worked with Contractors to design, construct and relocate the entire town to a new location one mile west to allow the construction of a second powerhouse for the Bonneville Dam.

North Bonneville is an ideal location for outdoor activities with the Pacific Crest Trail passing through the east side of the City, a Lewis and Clark Historical site, hot springs, and numerous lakes, rivers and hikes nearby.

A vicinity map showing the City of North Bonneville is included as Figure 1-1.

GOALS

Water system planning is essential to good management of a water system. This water system plan has been prepared to meet the following objectives.

- Ensure efficient use of available water resources.
- Coordinate planning efforts for growth and development with available water resources.
- Document existing system infrastructure and identify current and future system needs.
- Document water use efficiency measures.
- Provide information that will help to ensure that safe, high quality drinking water is delivered to existing and future system customers.
- Ensure reliable service during all conditions of operation.

WATER SYSTEM OWNERSHIP AND MANAGEMENT

Per the DOH Water Facilities Inventory (WFI), the name of the system is "The City of North Bonneville" and the water system identification number is 60150. A copy of the WFI is included in Appendix A.

The City is a Group A Community water system in Skamania County. The water system that serves this community is owned and operated by the City of North Bonneville. The customers pay a monthly water fee to the City. The current mailing address for the water system is:

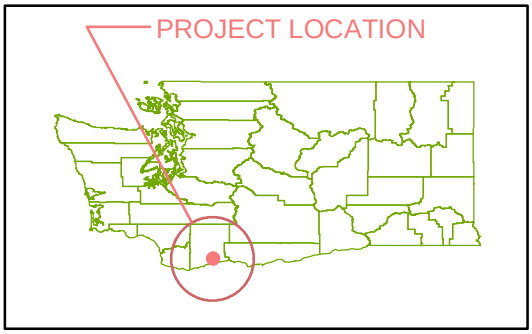
City of North Bonneville
214 CBD Mall
P.O. Box 7
North Bonneville, WA 99639
Phone (509) 427-8182

SYSTEM BACKGROUND

HISTORY OF WATER SYSTEM DEVELOPMENT AND GROWTH

The City is served by a water system which is owned and operated by the City of North Bonneville. Figure 1-2 shows the water system facilities, City boundaries and water service area. Figure 1-3 shows the retail service area. As required by the Municipal Water Law, the City has the responsibility to provide water to customers within the retail service area. Figure 1-4 shows the system study area and zoning.

The City of North Bonneville operates within a single pressure zone, has one well, two reservoirs, and no interties.



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CITY OF NORTH BONNEVILLE

WATER SYSTEM PLAN
FIGURE 1-1
VICINITY MAP

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M:\North Bonneville\11241 - WSP\GIS\FIG1-1 LOCATION.mxd

N

0 1,600 3,200 Feet

OLD RESERVOIR

NEW RESERVOIR

WELL #1

HAMILTON CREEK

GREENLEAF CREEK

TULE LAKE

GREENLEAF LAKE

BASS LAKE

BURLINGTON NORTHERN RR

2nd POWERHOUSE

CASCADE ISLAND

CASCADE DR.

EVERGREEN DR.

SR-14

COLUMBIA RIVER

BONNEVILLE DAM AND SPILLWAY

BRADFORD ISLAND

1st POWERHOUSE

PIERCE WILDLIFE REFUGE

WASTEWATER TREATMENT FACILITY

HAMILTON CREEK

LEGEND:

- City Limits
- Water Service Area
- Streams
- Reservoir
- Well
- Hydrant

Water Lines

- 4"
- 6"
- 8"
- 10"
- 14"

CITY OF NORTH BONNEVILLE

WATER SYSTEM PLAN
FIGURE 1-2
WATER SYSTEM FACILITIES MAP

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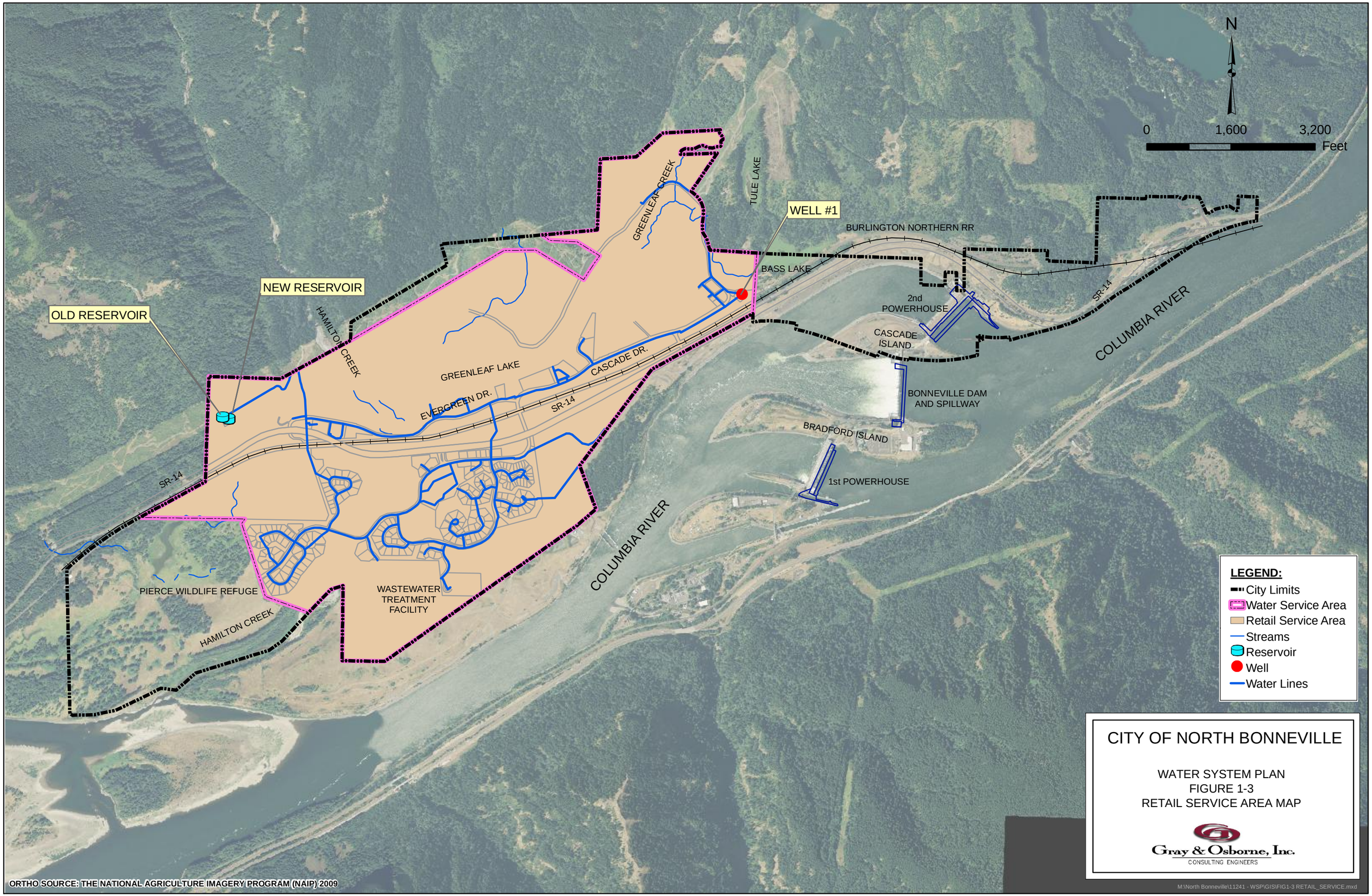
ORTHO SOURCE: THE NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) 2009

M:\North Bonneville\11241 - WSP\GIS\FIG1-2 WATER_FACILITIES.mxd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0
1,600
3,200
Feet
OLD RESERVOIR
NEW RESERVOIR
WELL #1
TULE LAKE
GREENLEAF CREEK
BURLINGTON NORTHERN RR
BASS LAKE
2nd
POWERHOUSE
SR-14
COLUMBIA RIVER
CASCADE
ISLAND
HAMILTON CREEK
GREENLEAF LAKE
CASCADE DR.
EVERGREEN DR.
SR-14
BONNEVILLE DAM
AND SPILLWAY
BRADFORD ISLAND
1st POWERHOUSE
COLUMBIA RIVER
SR-14
PIERCE WILDLIFE REFUGE
HAMILTON CREEK
WASTEWATER
TREATMENT
FACILITY
LEGEND:
City Limits
Water Service Area
Retail Service Area
Streams
Reservoir
Well
Water Lines
CITY OF NORTH BONNEVILLE
WATER SYSTEM PLAN
FIGURE 1-3
RETAIL SERVICE AREA MAP
Gray & Osborne, Inc.
CONSULTING ENGINEERS
ORTHO SOURCE: THE NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) 2009
M:\North Bonneville\11241 - WSP\GIS\FIG1-3 RETAIL_SERVICE.mxd

N

0 1,600 3,200 Feet

OLD RESERVOIR
NEW RESERVOIR
WELL #1
HAMILTON CREEK
GREENLEAF CREEK
TULE LAKE
GREENLEAF LAKE
BASS LAKE
EVERGREEN DR.
CASCADE DR.
SR-14
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2nd POWERHOUSE
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COLUMBIA RIVER
BONNEVILLE DAM AND SPILLWAY
BRADFORD ISLAND
1st POWERHOUSE
PIERCE WILDLIFE REFUGE
WASTEWATER TREATMENT FACILITY

LEGEND:

- City Limits
- Water Service Area
- Streams
- Reservoir
- Well
- Water Lines

Zoning

- Single Family Low Density Res
- Manufactured Home Subdivision
- Multi Family Med. Density Res
- Mixed Use
- Commerical Recreation
- Commercial
- Light Commercial
- Central Business District
- Industrial/Business Park
- Federally-owned Lands
- Public Parks
- School/Community Center
- Utilities Sites
- Cemetaries
- Open Space Preserve
- Churches
- Health Care Facilities
- State Land
- Timber Conservancy
- Agricultural and Wetland Preserve

CITY OF NORTH BONNEVILLE

WATER SYSTEM PLAN
FIGURE 1-4
ZONING MAP

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ORTHO SOURCE: THE NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) 2009

M:\North Bonneville\11341_WSP\GIS\FIG1-4 ZONING.mxd

The City's only well, Well 1, was constructed in 1975 and was equipped with a new motor and pump in July 2011. The well pumps at a rate of 625 gpm into a clearwell where the water is treated with sodium hypochlorite and sodium silicate for disinfection and corrosion control, respectively. A 600-gpm finished water pump in the well house pumps treated water into the distribution system and to the reservoirs on the other side of the City. The booster pump was equipped with a new motor and pump in September 2011.

Two steel reservoirs currently provide storage for the City. The Old Reservoir was constructed in 1970, was refurbished in 2002 and has a nominal capacity of 500,000 gallons. The New Reservoir was constructed in 2002 and has a nominal capacity of 500,000 gallons. The reservoirs are located next to one another and have the same dimensions. The overflow elevation of the reservoirs is at 242 feet.

NATURAL FEATURES OF THE SERVICE AREA

Geography and Climate

The City of North Bonneville service area is located along the Columbia River off of State Route 14 in Skamania County. The Bonneville Dam is directly east of the City. Figure 1-5 shows the area topography for the City. Elevations range from 400 feet above sea level in the northern portion of the City to 20 feet along the river in the south. The majority of homes within the City are located below an elevation of 60 feet.

Average temperatures have historically ranged from 39 degrees F in winter to 65 degrees F in summer; however, it is not uncommon for the City to experience winter temperature below 0 degrees F and summer temperatures above 100 degrees F. Total annual rainfall is 77 inches.

Soils and Geology

There are primarily four soil series within the City of North Bonneville's water service area. These soils include Arents, Bonneville stony sandy loam, McBee silt loam, and Pilchuck very fine sandy loam. Most of the soils in the area are well drained.

Soils within the City were significantly modified when the Town was relocated in the late 70s. As a result, soil dredging makes up the first 10 feet of soil depth throughout the City.

The underlying geology of the City of North Bonneville is predominantly Pleistocene outburst flood deposits.

Site Sensitive Areas

Site sensitive areas within the water service area include those classified as seismic hazard areas, flood hazard areas, wetlands, and surface waters. Wetlands and floodplain areas within the water service area are shown in Figures 1-6 and 1-7, respectively, and are described further below.

Seismic Hazard Areas

Seismic hazard areas are those with low-density soils that are more likely to experience greater damage due to seismic-induced subsidence, liquefaction, or landslides. Seismic hazard areas are regulated mainly with respect to public safety and with the exception of potential damage due to an earthquake.

Wetlands

EPA defines wetlands as areas that are inundated with water for at least part of the year. The U.S. Fish and Wildlife Service defines wetlands as those areas that have characteristics such as hydrophyte plants, hydric soils, and frequent flooding. Wetlands support valuable and complex ecosystems and consequently development is severely restricted if not prohibited in most wetlands. The National Wetlands Inventory map identifies wetlands in the City that follow the shoreline of the river and the port; Figure 1-6 illustrates the boundaries and types of wetlands within the City.

Flood Hazard Areas

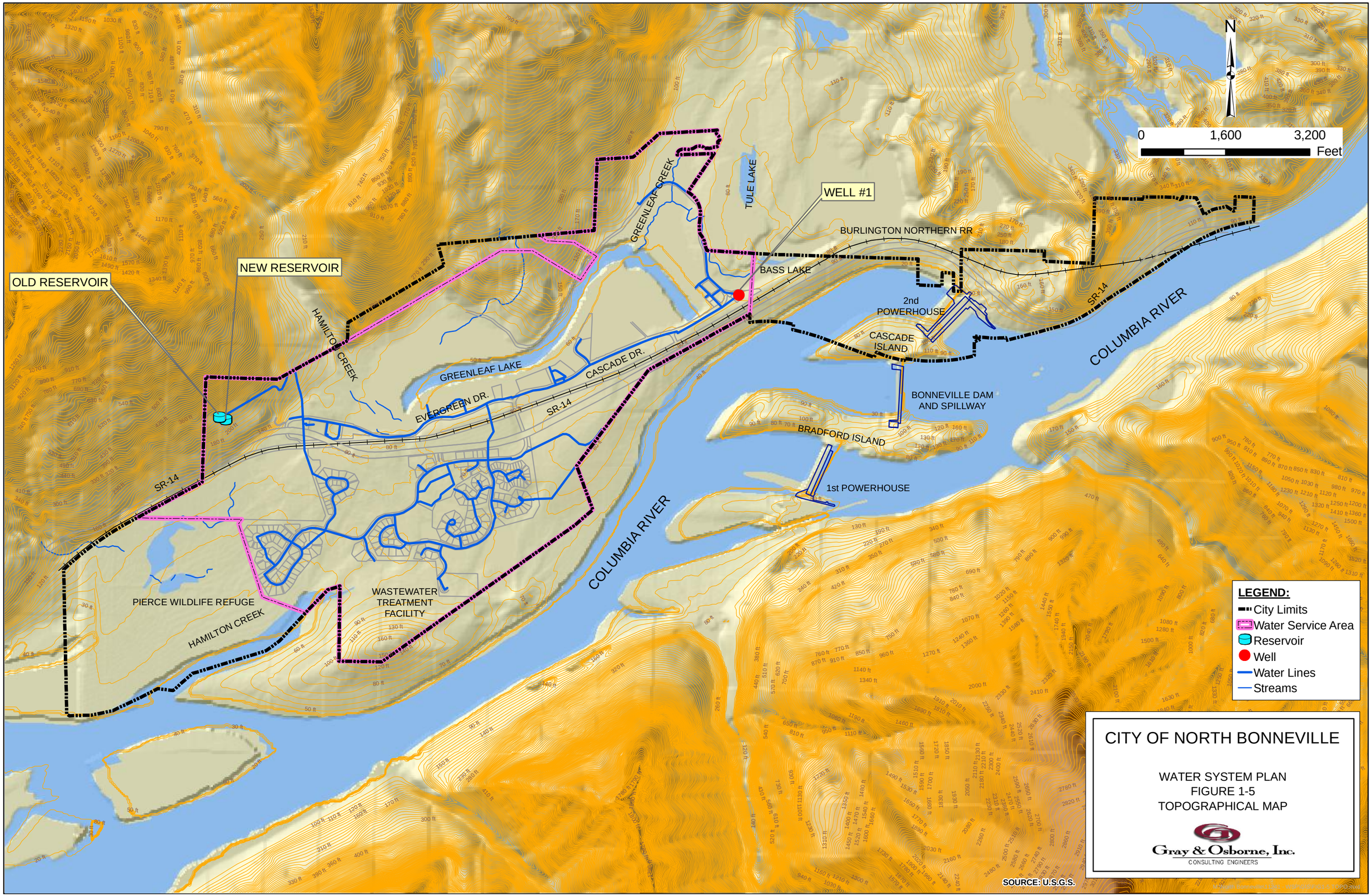
Flood hazard areas are areas adjacent to lakes, rivers, and streams that are prone to flooding during peak runoff periods. Flood hazard areas deserve special attention due to the sensitive nature of their ecosystems as well as the potential for damage to structures located within the floodplain.

Typically, construction in flood hazard areas is not allowed or is limited to specific activities. Allowed activities might be mining or gravel extraction, recreational uses, repair to existing structures, utility and road construction, or limited to uses dependent upon water such as docks, wharves, and boating activities.

The 100-year and 500-year floodplains in the vicinity of the City are shown on Figure 1-7. The floodplains are associated with the Columbia River, Hamilton Creek, and Greenleaf Creek.

Surface Waters

Lakes and streams are classified as sensitive areas due to the variety of plants and animals that they support. The City is located within Water Resource Inventory Data (WRIA) 29. The primary surface water features within or near the community is the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CASCADE DR.
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BONNEVILLE DAM
AND SPILLWAY
BRADFORD ISLAND
1st POWERHOUSE
COLUMBIA RIVER
PIERCE WILDLIFE REFUGE
HAMILTON CREEK
WASTEWATER
TREATMENT
FACILITY
LEGEND:
City Limits
Water Service Area
Reservoir
Well
Water Lines
Streams
CITY OF NORTH BONNEVILLE
WATER SYSTEM PLAN
FIGURE 1-5
TOPOGRAPHICAL MAP
Gray & Osborne, Inc.
CONSULTING ENGINEERS
SOURCE: U.S.G.S.

N

0 1,600 3,200 Feet

OLD RESERVOIR
NEW RESERVOIR
WELL #1
HAMILTON CREEK
GREENLEAF CREEK
TULE LAKE
BASS LAKE
GREENLEAF LAKE
EVERGREEN DR.
CASCADE DR.
SR-14
BURLINGTON NORTHERN RR
2nd POWERHOUSE
CASCADE ISLAND
COLUMBIA RIVER
BONNEVILLE DAM AND SPILLWAY
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1st POWERHOUSE
PIERCE WILDLIFE REFUGE
WASTEWATER TREATMENT FACILITY

LEGEND:

- City Limits
- Water Service Area
- Streams
- Reservoir
- Well
- Water Lines

Wetlands

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

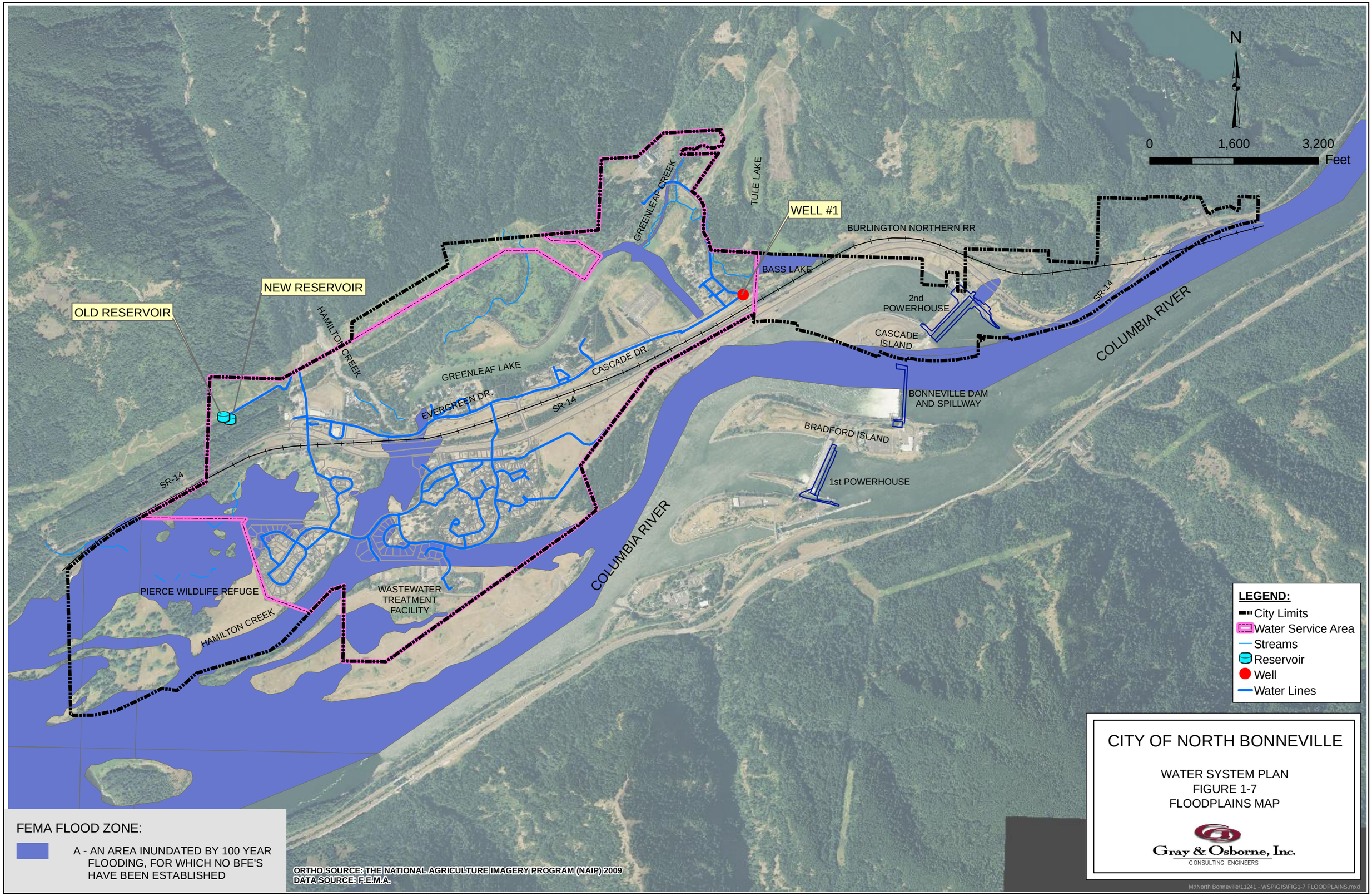
CITY OF NORTH BONNEVILLE

WATER SYSTEM PLAN
FIGURE 1-6
WETLANDS MAP

Gray & Osborne, Inc.
CONSULTING ENGINEERS

ORTHO SOURCE: THE NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) 2009
SOURCE: NATIONAL WETLANDS INVENTORY

M:\North Bonneville\11241 - WSP\GIS\FIG1-6 WETLANDS.mxd


N
0
1,600
3,200
Feet
OLD RESERVOIR
NEW RESERVOIR
WELL #1
HAMILTON CREEK
GREENLEAF CREEK
TULE LAKE
BASS LAKE
GREENLEAF LAKE
EVERGREEN DR.
CASCADE DR.
SR-14
BURLINGTON NORTHERN RR
2nd POWERHOUSE
CASCADE ISLAND
COLUMBIA RIVER
BONNEVILLE DAM AND SPILLWAY
BRADFORD ISLAND
1st POWERHOUSE
PIERCE WILDLIFE REFUGE
WASTEWATER TREATMENT FACILITY
HAMILTON CREEK
COLUMBIA RIVER
LEGEND:
City Limits
Water Service Area
Streams
Reservoir
Well
Water Lines
FEMA FLOOD ZONE:
A - AN AREA INUNDATED BY 100 YEAR FLOODING, FOR WHICH NO BFE'S HAVE BEEN ESTABLISHED
ORTHO SOURCE: THE NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) 2009
DATA SOURCE: F.E.M.A.
CITY OF NORTH BONNEVILLE
WATER SYSTEM PLAN
FIGURE 1-7
FLOODPLAINS MAP
Gray & Osborne, Inc.
CONSULTING ENGINEERS
M:\North Bonneville\11241 - WSP\GIS\FIG1-7 FLOODPLAINS.mxd

surrounding water of the Columbia River, Hamilton Creek, Greenleaf Creek, and Greenleaf Lake.

Fish and Wildlife Habitat

Fish and wildlife habitat is defined as areas essential for maintaining specifically listed species in suitable habitats. This definition was provided in "Fish and Wildlife Habitat Critical Area" section of WAC 365-190-080(5). The WAC further states that any proposed activity within 300 feet of these areas requires the preparation of a habitat assessment. This assessment is circulated to all the appropriate agencies for review. After agency review, a Habitat Management Plan may be required to address the impacts the project would have on habitat, provide background information of specific species, and recommend protection and mitigation measures for those species.

After project implementation, an assessment and evaluation of the success of the identified measures is required. This Plan is again circulated to the appropriate agencies for review. Minimum buffers from the critical habitat area may be required as part of the project implementation.

Wildlife observed in the area includes hawk, eagle, songbirds, deer, and beaver.

The Columbia River borders the City to the south and provides habitat for Coho salmon, Mid-Columbia River steelhead, Upper Columbia River summer steelhead, Columbia River Bull trout, Upper Columbia River spring Chinook salmon, Snake River spring/summer Chinook salmon, and Snake River sockeye salmon.

Hamilton and Greenleaf Creek are designated as a salmon habitat for Coho and Steelhead.

Over the past several years, the Lower Columbia River's Fish Enhancement Group has done work to create Chum salmon spawning areas in Lower Hamilton Creek.

Vegetation

The dominant tree species in the community includes fir, cedar, pine and white oak. Wet soil plants are found in the area and include cattail, buttercup, bulrush, and skunk cabbage.

ADJACENT PURVEYORS

The City of Stevenson operates a Group A water system, seven miles east of North Bonneville. The City of Stevenson serves a population of approximately 1,200 through 640 connections. The City of Stevenson's water supply comes from both surface and groundwater sources. In 1979 a flocculation, coagulation and sand filtration facility was

installed to alleviate water quality concerns. The capacity of the treatment plant is 1.0 million gallons per day.

The Army Corps of Engineers operates a Group A, non-transient/non-community water system at the Bonneville Dam Powerhouse 2. The system serves a non-residential population of approximately 62 persons through 4 connections. They operate two wells for a combined capacity of 1,000 gpm which pump from the same aquifer as the North Bonneville well.

According to a 1994 study by Woodward Clyde Consultants from Seattle, the Army Corps of Engineers pumps an average of 25 mgd through their fish hatchery. This volume is pumped from the same aquifer that the City uses.

INVENTORY OF EXISTING FACILITIES

SOURCE OF SUPPLY

The City of North Bonneville is served by a single well. Well 1 (Source No. 1) is 169-feet deep and is equipped with a 1,000-gpm pump. The City's Water Facilities Inventory (WFI) lists the capacity of the well as 625 gpm; the well pump is typically operated at 625 gpm. This well was constructed in November of 1975 and was equipped with a new motor and pump in 2010. Figure 1-8 is a photograph of Well 1.

After the well pump, the water is disinfected with chlorine gas and sodium silicate is added for corrosion control. Treated water passes into a clearwell beneath the pump house, but this is not required for treatment. The clearwell is 14.5 feet x 22 feet with a maximum water level of 8 feet. The clearwell has three 6-inch concrete baffle walls. The well pump is called based on a float in the clearwell, the pumps come on when the level reaches 6 feet and are turned off at 8 feet. The total volume of the clearwell is approximately 16,000 gallons.

Treated water is pumped from the clearwell by a finished water pump in the wellhouse into the distribution system and to the reservoirs across the City. The finished water pump has a rating of 500 gpm at a head of 213 feet. The pump is operated at 580 gpm at a head of 198 feet and is called based on the reservoir levels. It is called on when the reservoirs reach 27.54 feet, and turns off at 29.78 feet.

FIGURE 1-8

City of North Bonneville Well 1

Table 1-1 lists the water rights currently held by the City of North Bonneville. One water right certificate has been issued. A copy of the water right documentation is provided in Appendix B.

TABLE 1-1

City of North Bonneville Water Rights

Source	Certificate Number	Priority Date	Maximum Instantaneous Withdrawal	Maximum Annual Withdrawal
Well 1 (S01)	G2-24064C	February 11, 1976	1,000 gpm	336 acre-feet per year

Interties

The City does not have any interties with other water systems to receive or sell water.

Pressure Zones

The City's water system is in a single zone whose pressure is controlled by the overflow elevation in the Reservoirs, which are both at 232.0 ft.

WATER TREATMENT

Water from the City's well is treated and pumped to the reservoirs via the distribution system. The line from the wellhouse to the reservoirs is not a dedicated line. The City disinfects all water using sodium hypochlorite at its wellhouse. The City also treats with sodium silicate for corrosion control.

Sodium hypochlorite is currently used to provide a chlorine residual in the disinfection system only, it is not designed to provide the necessary contact time to meet a CT of 6. Per an email from Jozef Bezovics, Regional Engineer, Southwest Region DOH on November 10, 2011, a CT of 6 is not required.

STORAGE

There are two storage facilities that serve the City, the Old Reservoir and the New Reservoir.

The Old and New Reservoir, shown in Figure 1-9, are both steel tanks. The Old Reservoir is welded steel, and the New Reservoir is bolted steel. The Old Reservoir was constructed in 1976 by the Army Corps of Engineers. Based on construction drawings, the reservoir's inside diameter is 52 feet. The reservoir overflow is at 242 feet. The overflow is 32 feet above grade. This reservoir has a total storage volume of

508,000 gallons. The tank was seismically upgraded and repainted inside and out in 2003. The inlet and outlet are a shared 12-inch pipe inside the bottom of the reservoir.

The New Reservoir, also shown in Figure 1-9, is a bolted steel tank that was constructed in 2003. This reservoir is located directly adjacent to the Old Reservoir and has the exact same dimensions, a diameter of 52 feet, overflow of 242 feet, and a total storage volume of 508,000 gallons.

FIGURE 1-9

City of North Bonneville Old and New Reservoirs

TELEMETRY

The City has a telemetry system that provides the following functions for its water systems:

1. Monitoring Reservoir Levels.
2. Calls Booster Pump On/Off.
3. Calls Well Pump On/Off.

TRANSMISSION AND DISTRIBUTION

The majority of the distribution pipe in the City is 10-inch-diameter ductile iron pipe. PVC pipe is being used as portions of the distribution system are replaced and all of the 4-inch, 6-inch and 8-inch pipe is PVC pipe. A portion of the system that serves the reservoir, is 14-inch transite. Table 1-2 summarizes the approximate length of pipe in the City of North Bonneville's water system.

TABLE 1-2

City of North Bonneville Water System Pipe Length and Size

Pipe Diameter	Approximate Length of Pipe in System (lineal feet)
4 inch	3,405
6 inch	10,945
8 inch	13,190
10 inch	24,030
14 inch	2,870
Total	**64,440**

SERVICE METERS

The City distribution system is fully metered. A source meter is read daily at the City's well. Water service meter maintenance will be addressed in the CIP in Chapter 8.

RELATED PLANNING DOCUMENTS

The following documents were consulted in the preparation of this Plan:

Water System Plan, City of North Bonneville, February, 1998

The 1998 Plan was prepared by Parametrix, Inc.

City of North Bonneville, General Sewer Plan, 2005

WATER SERVICE AREA CHARACTERISTICS

EXISTING SERVICE AREA

The existing water service area includes the entire area within the North Bonneville City limits. The existing service area and City limits are illustrated in Figure 1-3. According to the most recent Water Facilities Inventory (WFI), there are 367 total service

connections, and the City is approved to serve 461 connections. There are no plans to extend the water service area beyond what is shown in Figure 1-3.

The City's water system serves no areas outside of the City limits.

The retail water service area boundaries are shown on Figure 1-3. The retail service boundary, as defined under the Municipal Water Law, is the entire water service area minus the area to the east of and outside of the North Bonneville City limits.

ZONING AND LAND USE

Zoning and land use is designated by the City. Land use within the City includes residential, commercial, and industrial areas. Zoning and land use is illustrated in Figure 1-4.

SERVICE AREA AGREEMENTS

The City of North Bonneville does not currently have any written service agreements with any entity outside of the City.

POLICIES

The City has ordinances for its water utility in Chapter 13.04 of the City's Municipal Code. Chapter 13.04 establishes the water department, provides administration and enforcement authority; protects the City's water sources; establishes service connection categories; and outlines a means for revenue collection.

CROSS-CONNECTION CONTROL PROGRAM

The adopted Cross-Connection Control Program and Resolution for the City of North Bonneville is based on WAC 246-290-490 and the American Water Works Association Cross-Connection Control Manual. Cross-Connection Control is discussed in greater detail in Chapter 6, Operations and Maintenance. Chapter 13.04.230 of the City Municipal Code addresses Cross-Connection Control.

POLICY FOR DEALING WITH COMPLAINTS

The City rarely gets complaints. When they do, they are typically seasonal and regard taste and odor. These complaints are taken seriously and handled on an individual basis. A complaint form is located in City Hall for customers to submit their complaints.

RECORD KEEPING

Water production is measured at the well and recorded on a daily basis on a year round basis, including holidays.

Residential service meters are read every two months. Commercial, industrial and multi-family accounts are also read every 2 months year round.

Water quality sampling and analysis is performed and recorded as required by DOH and is discussed in more detail in Chapter 3.

CHAPTER 2

BASIC PLANNING DATA

INTRODUCTION

Basic planning data essential for the assessment of the City of North Bonneville's water demands are presented in this chapter. Information is included regarding historical growth and water demands, population projections based on City planning data and historical growth rates, and water demand projections. Information presented is used to evaluate the condition of the existing system and determine future needs based on foreseeable demographic trends for the next 20 years.

CURRENT POPULATION, SERVICES, AND WATER DEMAND

HISTORICAL RESIDENTIAL POPULATION

The City of North Bonneville's population over the last 10 years is shown in Table 2-1.

TABLE 2-1

City of North Bonneville Historical Population 2002 to 2011

Year	Population	Growth Rate
2002	627	7.0%
2003	615	-1.9%
2004	685	11.4%
2005	741	8.2%
2006	828	11.7%
2007	882	6.5%
2008	877	-0.6%
2009	880	0.3%
2010	880	0.0%
2011	965	9.7%
Average Annual Growth Rate		**5.2%**

Source: Washington State Office of Financial Management (OFM) and 2011 City data.

As shown in Table 2-1, the City of North Bonneville's year 2002 population was estimated by the OFM to be 627. Over the past 10 years, the City's population has varied

from year to year with an average annual growth rate of 5.2 percent over the past 10 years.

SERVICE AREA POPULATION

The City of North Bonneville does not serve any housing units outside of the City limits. Therefore, the service area population is equal to the 2011 population within the City limits, 965.

SERVICE CONNECTIONS

Table 2-2 lists the City of North Bonneville's service connections, all connections are within the City limits. As shown in Table 2-2, the total number of active service connections at the end of the year 2011 was 344. There were 290 single-family residential, 21 multi-family residential, and 33 commercial, municipal and industrial connections. The 20 multi-family residential connections consist of apartments, condominiums, duplexes, triplexes, and group homes. The industrial service connections within the City limits include both heavy and light industrial customers.

TABLE 2-2

City of North Bonneville 2011 Active Service Connections

Customer Class	Connections
Single-Family Residential	290
Multi-Family Residential	21
Municipal	7
Commercial	18
Industrial	8
Total	**344**

WATER USE DATA COLLECTION

Water production is metered at the well. Production data is recorded every day, 7 days a week.

Production History

Table 2-3 provides a summary of the total volume of water produced by the City's well from 2006 to 2011.

TABLE 2-3

City of North Bonneville Water Production

Year	Well 1 Production (gallons)	Well 1 Production (gpd)
2007	69,401,500	190,141
2008	67,181,400	184,059
2009	67,682,300	185,431
2010	57,199,000	156,710
2011	67,680,700	185,427

As shown in Table 2-3, the total production for the City of North Bonneville has generally decreased over the last 5 years.

The average day production for the City's source in gallons per day (gpd) was calculated by dividing the total metered water production (as shown in Table 2-3 above) by 365 days per year. The average day production, along with the maximum day production, for 2007 through 2011 is shown in Table 2-4. Maximum day production was taken from the City's production records. The City tracks daily production for the source and therefore has a record of the highest production days for each month. The ratio of maximum day production to average day production is also shown in Table 2-4.

TABLE 2-4

City of North Bonneville Average and Maximum Day Production

Year	Average Day Production (gpd)	Maximum Day Production (gpd)	Maximum Day Peaking Factor
2007	190,141	579,600	3.05
2008	184,059	595,900	3.24
2009	185,431	710,600	3.83
2010	156,710	562,500	3.59
2011	185,427	526,100	2.84
Average 2007-2011			**3.31**

The ratio of the average day production to maximum day production will be used to project future maximum day production requirements for the City based on projected average day production. The average maximum day peaking factor from 2007 to 2011 is 3.31, this will be used to project future maximum day demands in this Plan.

Consumption History

The City of North Bonneville's average day water consumption from 2007 through 2011 for each customer class is shown in Table 2-5.

TABLE 2-5

Metered Consumption by Customer Class (gpd)

Year	Residential	Multi-Family	Hamilton Park	Municipal	Commercial	Industrial	Total
2007	71,393	6,593	4,483	16,912	2,618	1,886	**103,885**
2008	67,158	6,680	3,897	20,876	3,176	1,716	**103,502**
2009	66,912	7,337	3,012	25,131	1,930	991	**105,313**
2010	59,531	9,656	3,487	19,178	1,817	1,711	**95,380**
2011	76,793	6,308	3,510	24,922	2,059	2,665	**116,258**

Hamilton Park is an apartment complex with 25 units for persons 55 years and older. Commercial consumption includes businesses, restaurants, and services to the City. Industrial consumption includes production facilities that are located within the City limits.

Equivalent Residential Units

Use of Equivalent Residential Units (ERUs) is a way to express water use by non-residential customers as an equivalent number of residential customers. ERUs are calculated by dividing the total volume of water utilized in the single-family customer class by the total number of single-family residential connections. This number defines the average single-family residential water use. Table 2-6 shows the number of single-family connections, single-family water use, and resulting ERU value from 2007 to 2011.

TABLE 2-6

Historical Single Family Connections, Consumption, and ERU Value

Year	Connections	Consumption (gpd)	ERU (gpd/ERU)
2007	277	71,393	258
2008	287	67,158	234
2009	287	66,912	233
2010	289	59,531	206
2011	290	76,793	265
2007-2011 Average	**286**	**68,357**	**239**

The average single-family residential water use for the City of North Bonneville in 2011 (which is equivalent to one ERU) was 265 gpd (=76,793 gpd/290 residential connections). The ERU value has generally decreased since 2007, with the exception of 2011. For planning purposes, the average ERU value from 2007 to 2011 will be used. Thus, the average single-family residential water use for the City of North Bonneville is 239 gpd. The volume of water used by other customer classes can then be divided by the average single-family residential water use to determine the equivalent residential units utilized by the other customer classes. The ERUs for all customer classes are shown in Table 2-7.

TABLE 2-7

City of North Bonneville Year 2011 Equivalent Residential Units

Customer Class	Average Consumption (gpd)	Number of Connections	ERUs[2]	Number of ERUs per Unit
Single-Family Residential	76,793	290	321	1.11
Multi-Family Residential[1]	9,818	21	41	1.96
Municipal	24,922	7	104	14.89
Commercial	2,059	18	9	0.48
Industrial	2,665	8	11	1.39
Total	**116,258**	**344**	**486**	

(1) The City serves 95 multi-family units through 21 connections.
(2) Equal to the average consumption divided by the ERU value of 239 gpd/ERU in 2011.

Large Water Users

The two largest water users that the City of North Bonneville serves are the Hamilton Park Apartments and the Bonneville Hot Springs. They consumed 426 gpd and 415 gpd, respectively, in 2010. These customers account for less than 1 percent of metered consumption in 2010.

Distribution System Leakage

Distribution system leakage (DSL) is defined as the difference between metered source production and all accounted for sources of water usage. Prior to DOH instituting the new Water Use Efficiency requirements, all non-revenue water was called "lost and unaccounted for water." However under the new rules, all non-revenue water is simply considered DSL, whether it is resulting from actual leakage in the distribution system or is caused by some other factor such as unmetered usage, unaccounted for hydrant flushing, or inaccurate meters. Table 2-8 summarizes the distribution system leakage for water for 2007 through 2011.

As shown in Table 2-8, the City's DSL has generally steadily decreased since 2007. In 2011, DSL made up 25,246,626 gallons, or approximately 69,170 gpd. As previously stated, an ERU is defined as 239 gpd. Therefore, in 2011 DSL was equivalent to 289 ERUs. This is almost equivalent to the number of ERUs for the City's single-family residences. The total water production in 2011 equates to 776 ERUs, which includes single-family residents, multi-family residents, commercial use, industrial use, and DSL.

A likely source of DSL is an unreliable source meter, shown to be deficient by testing in January 2012. This will be discussed in detail in Chapter 4.

TABLE 2-8

Distribution System Leakage

Year	Production (gallons)	Consumption (gallons)	DSL (gallons)	Percent DSL
2007	69,401,500	37,918,010	31,483,490	45.4%
2008	67,181,400	37,778,169	29,403,231	43.8%
2009	67,682,300	38,439,290	29,243,010	43.2%
2010	57,199,000	34,813,819	22,385,181	39.1%
2011	67,680,700	42,434,074	25,246,626	37.3%

Per Capita Water Production

The City of North Bonneville water production per capita is shown in Table 2-9. As shown, the production per capita averaged 192 gpcd in the year 2011, and is comprised of residential, commercial, industrial, and distribution system leakage components. The total per capita water production of 192 gpcd is average compared to many other communities. However, industrial and commercial use per capita are relatively low (3 gpcd and 2 gpcd, respectively) and distribution system leakage per capita (72 gpcd) is relatively high.

TABLE 2-9

City of North Bonneville Year 2011 Water Production Per Capita

Water Use Category	Average Daily Production (gpd)	Estimated Per Capita Use (gpcd)[(1)]
Residential (Includes Single-Family and Multi-Family Use)	86,611	90
Municipal	24,922	26
Commercial	2,059	2
Industrial	2,665	3
Distribution System Leakage (DSL)	69,169	72
Total	**185,427**	**192**

(1) Per capita use is based on a year 2011 service area population of 965.

FUTURE POPULATION AND WATER DEMANDS

PROJECTED POPULATION

Population projections for the 20-year planning horizon were estimated for the City of North Bonneville water service area using historical growth rates seen for the City and City estimates on how growth is expected. The average annual growth rate within the City over the last 10 years was 5.2 percent. The OFM 2007 population projections for Skamania County show a varied growth rate between 0.74 and 1.24 percent. The City expects the actual growth within the City limits to lie between these rates, with a 2017 population of 1,246 and a growth rate of 4.35 percent. Assuming there will be no additional annexation within the next 20 years, this growth rate is used to project the future service area population. It is reasonable to assume no additional annexation because the City is bounded on all sides by Federal land, State land, and National Scenic Area. The City has previously developed ultimate buildout population based on land use, the buildout population is 2,875. Table 2-10 summarizes these projections.

TABLE 2-10

Projected Service Area Population

Year	Population
2011	965
2012	1,007
2013	1,051
2014	1,096
2015	1,144
2016	1,194
2017	1,246
2032	2,360

The 6-year planning horizon population projection for the City is 1,246 in 2017. The 20-year population is estimated at 2,360 in 2032. The buildout population of 2,875 is expected to be reached in 2037.

WATER DEMAND PROJECTIONS

An essential component of the Plan is to project water demands during the 6-year and 20-year planning periods. As noted, the three types of demand that are considered in this Plan include average day, maximum day, and peak hourly. Average day demand is projected using the number of ERUs and the average day consumption per ERU. For this Plan, an ERU is equivalent to 239 gpd.

Table 2-11 shows the increasing trend of ERUs and consumption over the next 20 years. Distribution system leakage is not included in the projections of Table 2-11.

TABLE 2-11

Projected Population, ERUs and Average Day Consumption without Conservation and without Distribution System Leakage

Year	Population	Projected ERUs[(1)]	Consumption (gpd)[(2)]
2012	1,007	507	121,300
2013	1,051	529	126,600
2014	1,096	552	132,100
2015	1,144	576	137,800
2016	1,194	602	143,800
2017	**1,246**	**628**	**150,100**
2018	1,300	655	156,600
2019	1,357	683	163,400
2020	1,416	713	170,600
2021	1,477	744	178,000
2022	1,542	777	185,700
2023	1,609	810	193,800
2024	1,679	846	202,200
2025	1,752	882	211,000
2026	1,828	921	220,200
2027	1,907	961	229,800
2028	1,990	1,003	239,800
2029	2,077	1,046	250,200
2030	2,167	1,092	261,100
2031	2,261	1,139	272,400
2032	**2,360**	**1,189**	**284,300**

(1) ERUs are project to increase at the same rate as the City population, 4.35 percent

(2) Projected average consumption = ERUs * 239 gpd/ERU (rounded to the nearest 100 gpd)

In order to project production, the percentage of DSL for water was assumed to remain at the current DSL level of 37.3 percent. As discussed in later in this Plan, the City must adopt an aggressive conservation plan to reduce DSL to the 10 percent mandated by the Water Use Efficiency requirements. Table 2-12 summarizes the projected average day production through 2032 assuming DSL remains unchanged at 37.3 percent.

TABLE 2-12

Projected Average Day Production through the Year 2032
Assuming Distribution System Leakage is Unchanged

Year	Consumption (gpd)	DSL at 37.3% (gpd)	Production (gpd)
2012	121,300	72,200	193,500
2013	126,600	75,300	201,900
2014	132,100	78,600	210,700
2015	137,800	82,000	219,800
2016	143,800	85,500	229,300
2017	**150,100**	**89,300**	**239,400**
2018	156,600	93,200	249,800
2019	163,400	97,200	260,600
2020	170,600	101,500	272,100
2021	178,000	105,900	283,900
2022	185,700	110,500	296,200
2023	193,800	115,300	309,100
2024	202,200	120,300	322,500
2025	211,000	125,500	336,500
2026	220,200	131,000	351,200
2027	229,800	136,700	366,500
2028	239,800	142,700	382,500
2029	250,200	148,800	399,000
2030	261,100	155,300	416,400
2031	272,400	162,000	434,400
2032	**284,300**	**169,100**	**453,400**

Projected average day, maximum day, and peak hour production through the year 2032 are shown in Table 2-13. Maximum day production is based on a peaking factor of 3.31 (from Table 2-4), which is the historic ratio of average day to peak day.

The maximum quantity of water produced in a 1-hour period during a maximum day demand is the peak hour demand. If precise records of peak hour demand are not available, peak hour is often expressed in terms of a peaking factor. A peaking factor is defined as the ratio of peak hour to the maximum day demand. It is generally accepted that peak hour factors range from 1.5 to 2.5. The DOH Water System Design Manual, August 2001, provides a methodology for calculating peak hour demand (PHD). The generalized equation is as follows:

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

Where: PHD = *Peak Hourly Demand, (gallons per minute, gpm)*
C = *Coefficient Associated with Ranges of ERUs*
N = *Number of Service Connections, ERUs*
F = *Factor Associated with Ranges of ERUs*
MDD = *Maximum Day Demand, (gpd/ERU)*

It was previously determined that an ERU was equal to 239 gpd. The total number of ERUs for the water system in the year 2011 was calculated by dividing the average day consumption of each customer class plus distribution system leakage by 239 gpd. The result is the system serves a total of 776 ERUs in 2011.

The values for C and F of the peak hour demand formula are taken from the DOH Water System Design Manual, Table 5-1, page 5-8. C is equal to 1.6 and F is equal to 225. The MDD is estimated as: MDD = 239 gpd/ERU * 3.31 = 791 gpd/ERU.

By substituting these values into the equation above, the PHD for the year 2011 is calculated to be 824 gallons per minute (gpm). Thus, the calculated peaking factor between peak hour demand and maximum day demand for the entire system is 1.99 (824/(594,900/1440) = 1.99).

The calculated peak hour demand of 824 gpm using the DOH Water System Design Manual formula exceeds the capacity of source, 625 gpm. The City does not experience peak demands as high as 824 gpm.

Table 2-13 summarize peak hour demand forecasts through the year 2032.

TABLE 2-13

Projected Average Day, Maximum Day and Peak Hour Production Through Year 2032 Assuming Distribution System Leakage is Unchanged

Year	Average Day Production (gpd)	Maximum Day Production (gpd)	Maximum Day Production (gpm)	Peak Hour Production (gpm)
2012	193,500	640,278	445	885
2013	201,900	668,073	464	923
2014	210,700	697,192	484	963
2015	219,800	727,303	505	1,005
2016	229,300	758,738	527	1,049
2017	**239,400**	**792,158**	**550**	**1,095**
2018	249,800	826,571	574	1,142
2019	260,600	862,307	599	1,192
2020	272,100	900,360	625	1,244
2021	283,900	939,406	652	1,298
2022	296,200	980,105	681	1,354
2023	309,100	1,022,791	710	1,413
2024	322,500	1,067,130	741	1,475
2025	336,500	1,113,455	773	1,539
2026	351,200	1,162,097	807	1,606
2027	366,500	1,212,723	842	1,676
2028	382,500	1,265,666	879	1,749
2029	399,000	1,320,264	917	1,825
2030	416,400	1,377,839	957	1,904
2031	434,400	1,437,400	998	1,986
2032	**453,400**	**1,500,269**	**1,042**	**2,073**

(1) Maximum day demand was projected by applying a peaking factor of 3.31 (from Table 2-4).

(2) Peak hour demand was projected by applying a peaking factor of 1.99 (see above).

CHAPTER 3

SYSTEM ANALYSIS

INTRODUCTION

The purpose of this chapter is to determine if the existing water system facilities are able to supply sufficient quality and quantity of water to meet existing and projected demands. In this section, three major planning components will be analyzed:

- Water Quality Analysis.
- Water System Component Analysis.
- Water System Summary of Deficiencies.

The design and construction standards identify the standards that apply to the City's water system facilities. The system component analyses compare the various design standards to the City's existing facilities. Based on these analyses, a summary of deficiencies is provided. Recommended improvements, project costs, and prioritization of recommended improvements are presented in Chapter 8 of this Plan.

WATER SYSTEM STANDARDS

The City complies with water quality standards established by the Washington State Department of Health.

Design standards established by the Washington State Department of Health are used to evaluate the City's water system in this Chapter.

WATER QUALITY ANALYSIS

Introduction

Group A public community water systems must comply with the drinking water standards of the Federal Safe Drinking Water Act and its amendments. The Washington State Department of Health (DOH) adopted the Federal Standards under WAC 246-290, which became effective April 27, 2003. This chapter describes the water quality parameters necessary to ensure the delivery of safe potable drinking water to the City's customers. This chapter also evaluates the City's efforts to comply with required regulations and testing requirements.

The quality of the source water for its drinking water system is of primary concern to the City. The City has historically provided a high quality of drinking water to its service area and currently complies with all water quality monitoring requirements. The City's

water quality monitoring program meets the sampling frequency prescribed by DOH regulations. The City publishes a consumer confidence report titled the *Annual Drinking Water Quality Report* in an effort to keep consumers informed as to the quality of both their water supply and water delivery systems.

The following water quality issues are discussed in this chapter:

- Description of both current and future drinking water quality regulations, as they apply to the City's water system.
- Evaluation of the City's drinking water quality.
- Schedule for future water quality monitoring.

The Safe Drinking Water Act (SDWA) of 1974, amended in 1986 and 1996, established specific roles for the Federal government, State government, and water system purveyors, with respect to water quality monitoring. The U.S. Environmental Protection Agency (EPA) is authorized to develop national drinking water regulations and oversee the implementation of the SDWA. State governments are expected to adopt the Federal regulations and accept primary responsibility or "primacy" for administration and enforcement of the Act. Public water system purveyors are assigned the day-to-day responsibility of meeting regulations by incorporating monitoring, recording, and sampling procedures into their operation and maintenance programs.

Water Quality Standards

Table 3-1 lists drinking water regulations, the affected contaminants, and indicates which regulations require the City to conduct monitoring or take other action. Existing state law contains regulations for bacteriological contaminants, inorganic chemicals and inorganic physical parameters (IOCs), volatile organic chemicals (VOCs), synthetic organic chemicals (SOCs), radionuclides, and total trihalomethanes (TTHMs).

The implementation schedules for the proposed new regulations are subject to revision and the City should continue to stay informed regarding regulatory deadlines.

TABLE 3-1

Drinking Water Regulations[1]

Drinking Water Regulation[1]	Contaminants Affected[2]	City Action
Bacteriological	Coliform	Monitoring
Residual Disinfectant	Total Free Chlorine	Monitoring
Consumer Confidence Report	Reporting Only	Reporting
Inorganic Chemicals and Physical Parameters	IOCs	Monitoring
Arsenic Rule	Arsenic	Monitoring
Volatile and Synthetic Organic Compounds	VOCs, SOCs	Monitoring
Asbestos	Asbestos	Monitoring
Lead and Copper Rule	Lead, Copper	Monitoring
Radionuclide Rule	Radionuclides	Monitoring
Disinfectants/Disinfection Byproducts Rule (Stages I&II)	TTHMs, HAA5, Chlorite, Bromate	Monitoring and Planning
Groundwater Rule	Bacteriological	Planning
Surface Water Treatment Rule	Microbial Contaminants	Not Applicable
Information Collection Rule	Bacteriological	Not Applicable
Filter Backwash Recycling Rule	Bacteriological	Not Applicable
Interim Enhanced Surface Water Treatment Rule	Bacteriological	Not Applicable
Long Term 1 Enhanced Surface Water Treatment Rule	Bacteriological	Not Applicable

(1) Drinking water regulations as of December 2011.
(2) TTHM = Total Trihalomethanes; HAA5 = Five Haloacetic Acids; IOCs = Inorganic Chemical and Physical Characteristics; VOCs = Volatile Organic Chemicals; SOCs = Synthetic Organic Compounds

Minimum standards for water quality are specified in terms of Maximum Contaminant Levels (MCLs). Primary MCLs are based on chronic and/or acute human health effects. Secondary MCLs are based on factors other than health effects, including aesthetics. MCLs are specified in WAC 246-290 and described further in the following pages and tables. The following sections discuss the applicable water quality regulations, analysis of the City's compliance with these regulations, and a summary of anticipated future regulations. A water quality monitoring schedule is presented at the end of this section.

Consumer Confidence Report

The Consumer Confidence Report is a rule from 1998 that requires community water system purveyors to prepare and distribute an annual report of water quality analyses to their customers. The City is required to submit the report to its customers by the first of

July each year. The City's report is mailed with utility bills and a copy of the most recent CCR is provided in Appendix C of this Plan.

Bacteriological

Introduction

Coliform bacteria is a general category of bacteria routinely monitored in potable water systems. Not all coliform bacteria are pathogenic but they are relatively easy to identify in laboratory analysis and represent an indicator organism. This means that if coliform bacteria are detected, then pathogenic organism may also be present. Bacterial contamination of a potable water system can cause a number of waterborne diseases, so coliform analysis is strictly monitored and regulated by the DOH.

The Coliform Monitoring Rule specifies two types of violations, "nonacute MCL" and "acute MCL." A purveyor is required to notify both the DOH and system consumers if either MCL violation occurs. A violation of bacteriological MCLs occurs during routine sampling when:

- Coliform is detected in more than one sample in a single month (nonacute MCL);
- Coliform is present in a set of repeat samples collected as a follow-up to a sample with fecal coliform or E. coli presence (acute MCL);
- Fecal coliform or E. coli is present in a repeat sample after coliform was detected in the routine sample (acute MCL).

Monitoring Requirements and Analysis

The City monitors for bacteriological contaminants in accordance with its Water Quality Monitoring Plan. The number of required monthly samples is provided annually from DOH on the Water Quality Monitoring Report. The City is required to collect one sample per month.

According to City records and the DOH Sentry database, the City has had only one positive coliform hit since 1998. The test was from 2001 and found total coliform with no E. coli present. The follow-up sample was negative for coliform. Under DOH rules, if follow-up samples show no coliform, the City is in compliance and no additional action is required. The City continues to maintain a detectable chlorine residual in its distribution and has had taken no positive coliform samples since 2001.

Residual Disinfectant

According to WAC 246-290-300, systems providing disinfection treatment shall measure residual disinfectant concentration within the distribution system when taking routine or

repeat coliform samples. The City complies with this requirement and records chlorine residuals along with coliform sampling results. The City's chlorination goal is to maintain a detectable residual chlorine concentration within the distribution system. Chlorine residual concentrations are monitored during bacteriological sampling and if no chlorine is detected, City staff flushes the local distribution mains.

The City is not required by DOH to provide a CT of 6 per an email from Jozef Bezovics, Regional Engineer, Southwestern Region DOH dated November 10, 2011. The City voluntarily disinfects its water system with chlorine gas.

Inorganic Physical and Chemical Characteristics

Introduction

This category includes several inorganic elements and compounds. Many of the inorganic chemicals include elemental metals such as mercury, arsenic, and iron. Some non-metallic constituents such a chloride, fluoride, and sulfate are also included. Physical properties that affect water quality in this category include turbidity, specific conductivity, total dissolved solids, and color.

WAC 246-290-310 specifies primary and secondary MCLs for inorganic physical and chemical characteristics. Primary MCLs are based on health effects, and secondary MCLs are based on non-health factors, such as aesthetics. Three chemicals, lead, copper, and sodium do not have primary or secondary MCLs, but are required to be monitored along with other IOCs. Lead and copper are regulated under the Lead and Copper Rule, described in detail later in this chapter. Primary and secondary MCLs for inorganic chemical and physical characteristics are summarized in Tables 3-2 and 3-3, respectively.

Monitoring Requirements and Analysis

Groundwater sources must be sampled for inorganics once every 8 years, unless a monitoring waiver is granted by DOH. The City's last IOC analysis on Well 1 was taken in 2007 and because they do not have a waiver, the next round of sampling must be taken by December 2015. Nitrate samples are required annually and nitrite samples are required once every 3 years. Because nitrates and nitrites are included in Inorganic Chemical (IOC) sampling, additional individual samples are not required in years when an IOC is taken from the source.

The 2007 inorganic water quality analysis for the City's one active source is summarized in Table 3-4; a complete list of results is located in Appendix D.

TABLE 3-2

Primary Water Quality Standards – Inorganic Chemical Characteristics

Chemical	Primary MCL
Antimony (Sb)	0.006 mg/L
Arsenic (As)	0.01 mg/L
Asbestos	7 million fibers/liter (length > 10 microns)
Barium (Ba)	2.0 mg/L
Beryllium (Be)	0.004 mg/L
Cadmium (Cd)	0.005 mg/L
Chromium (Cr)	0.1 mg/L
Copper (Cu)	1.3 mg/L (Action Level)
Cyanide (HCN)	0.2 mg/L
Fluoride (F)	4.0 mg/L
Lead (Pb)	0.015 mg/L (Action Level)
Mercury (Hg)	0.002 mg/L
Nickel (Ni)	0.1 mg/L
Nitrate (as N)	10.0 mg/L
Nitrite (as N)	1.0 mg/L
Selenium (Se)	0.05 mg/L
Sodium (Na)	20 mg/L (EPA recommendation)
Thallium (Tl)	0.002 mg/L

Source: WAC 246-290-310.

TABLE 3-3

Secondary Water Quality Standards – Inorganic Chemical and Physical Characteristics

Chemical/Characteristic	Secondary MCL
Chloride (Cl)	250.0 mg/L
Fluoride (F)	2.0 mg/L
Iron (Fe)	0.3 mg/L
Manganese (Mn)	0.05 mg/L
Silver (Ag)	0.1 mg/L
Sulfate (SO4)	250.0 mg/L
Zinc (Zn)	5.0 mg/L
Color	15 Color Units
Hardness	None Established
Specific Conductivity	700 umhos/cm
Total Dissolved Solids (TDS)	500 mg/L

Source: WAC 246-290-310.

TABLE 3-4

City of North Bonneville 2007 IOC Sample Results [(1)]

Primary Regulated		**Well #1 - S01**	
Parameter	**MCL**	**Result**	**State Reporting Limit**
Arsenic	0.01 mg/L	0.003	0.003
Barium	2.0 mg/L	0.0059	0.40
Fluoride	4.0 mg/L	0.5	0.5
Nitrate - N	10.0 mg/L	0.20	0.20
Secondary Regulated			
Parameter	**MCL**		
Iron	0.3 mg/L	0.20	0.10
Manganese	0.05 mg/L	**0.16**	0.01
Chloride	250 mg/L	1.9	20.0
Sulfate	250 mg/L	13.0	50.0
Zinc	5.0 mg/L	0.20	0.20
State Regulated			
Parameter	**MCL**		
Sodium	20 mg/L[(2)]	15	5.0
Hardness	None Established	55	10
Conductivity	700 umhos/cm	160	70
Turbidity	1 NTU	0.10	0.10
TDS	500 mg/L	120	100
State Unregulated			
Parameter	**Action Level**		
Lead	0.015 mg/L	0.001	0.001
Copper	1.3 mg/L	0.02	0.02

(1) A complete list of samples parameters is located in Appendix D.
(2) EPA has established a recommended limit of 20 mg/l for consumers with dietary restrictions related to sodium intake.

Arsenic

Introduction

Arsenic is an inorganic chemical that has received significant attention due to recent rule revisions. Long-term exposure to low concentrations of arsenic in drinking water can lead to skin, bladder, lung, or prostate cancer. Non-cancer effects of ingesting arsenic at low levels include cardiovascular disease, diabetes, and anemia, as well as reproductive, developmental, immunological, and neurological effects.

After several proposals and revisions by EPA, a new arsenic MCL of 0.01 mg/L became effective in February 2002. Compliance with the new MCL standard of 0.01 mg/L was required for all systems on January 23, 2006.

Monitoring Requirements and Analysis

The Arsenic Rule makes monitoring requirements consistent with monitoring for other IOCs. Groundwater sampling for arsenic is required once every 3 years. Any system that has a sampling point monitoring result exceed the MCL must increase the frequency of monitoring at that sampling point to quarterly sampling. Compliance with the MCL would be based on the running annual average of the samples. Systems triggered into increased monitoring would not be considered in violation of the MCL until they have completed 1 year of quarterly sampling. However, if any sample result will cause the running annual average to exceed the MCL at any sampling point, the system is out of compliance with the MCL immediately.

Inorganic testing shows no positive tests for arsenic, with levels well below the MCL. The next round of arsenic testing is due by December 2013.

Iron and Manganese

As shown in Table 3-4, iron and manganese has been detected in the City's source. However, the last time these parameters exceeded secondary water quality standards was in 2001 when the Well had iron measured at 1.0 mg/L and manganese at 0.3 mg/L. There have been no exceedances of the iron and manganese secondary MCLs since treatment was installed at the well house in 2001.

As Table 3-4 indicates, iron is well below the MCL. The manganese sample from 2007 shows an exceedance of the MCL with a level of 0.16 mg/L. The manganese sample from 2004 was below the MCL at 0.045 mg/L. Manganese is a secondary contaminant for which action is not necessarily required for existing sources. The MCL of 0.050 mg/L is set for esthetic purposes and not health purposes. DOH has only required treatment for manganese in a few circumstances when the community overwhelmingly requests treatment and is willing to pay for the improvements.

Taste and Odor

The City rarely gets taste or odor complaints from customers. DOH has no records of taste and odor complaints for the City of North Bonneville water system and will not require action unless persistent and significant taste and odor reports occur.

Lead and Copper

Introduction

In 1991, the EPA promulgated the Federal Lead and Copper Rule. The State of Washington adopted this rule in 1995, with minimal changes. The Lead and Copper Rule is intended to reduce the tap water concentrations of lead and copper that can occur when corrosive source water causes lead and copper to leach from water meters and other plumbing fixtures. Possible treatment techniques to reduce lead and copper leaching include pH adjustment by addition of caustic soda or soda ash to the source water prior to distribution.

Monitoring Requirements and Analysis

Based on the requirements of the EPA Lead and Copper Rule (40 CFR 141), lead and copper monitoring must be completed for two consecutive 6-month monitoring periods. If lead and copper action levels are not exceeded, then the number of samples may be reduced to one-half the original number for three consecutive annual periods. Assuming compliance with the action level is maintained, reduced sampling may continue once every 3 years thereafter.

Ninety percent of the distribution system lead samples collected according to the procedures outlined in WAC 246-290 must have concentrations below the "Action Level" of 0.015 mg/L. Similarly, 90 percent of the copper samples must have concentrations less than 1.3 mg/L. Systems exceeding the action levels are required to provide public notification and implement a program for reducing lead and copper levels.

The City last collected lead and copper samples in August 2009. Distribution system samples were taken at 10 locations. The results of the lead and copper testing conducted in 2009 are located in Appendix D. The lead and copper sample results indicate concentrations below the action levels. The City uses sodium silicate for treatment at their well. Sodium silicate is an inhibitor for lead and copper. The next round of lead and copper testing is required by December 2012.

Volatile Organic Compounds and Synthetic Organic Compounds

Introduction

Volatile organic chemicals (VOCs) are manufactured, carbon-based chemicals that vaporize quickly at normal temperatures and pressures. VOCs include many hydrocarbons associated with fuels, paint thinners, and solvents. This group does not include organic pesticides, which are regulated separately as synthetic organic chemicals (SOCs). VOCs are divided into the two following groups:

1. Regulated VOCs that have been determined to post a significant risk to human health.

2. Unregulated VOCs for which the level of risk to human health has not been established.

There are currently 21 regulated volatile organic Chemicals (VOCs) and 33 regulated Synthetic Organic Chemicals (SOCs). A list of these compounds and their MCLs is included in Tables 3-5 and 3-6.

Monitoring Requirements and Analysis

Per DOH requirements, SOCs and VOCs must be sampled once every 3 years, unless a waiver is in place. Most recent sampling of SOCs and VOCs was in August 2010 and no compounds were detected. The next round of testing is required by December 2013.

TABLE 3-5

Regulated Synthetic Organic Chemicals (SOC)

Synthetic Organic Chemical	Federal Regulation	Primary MCL (mg/L)[1]
Arochlor	Phase II	0.002
Aldicarb	Phase II[2]	0.003
Aldicarb sulfone	Phase II[2]	0.003
Aldicarb sulfoxide	Phase II[2]	0.004
Atrazine	Phase II	0.003
Carbofuran	Phase II	0.04
Chlordane	Phase II	0.002
Dibromochloro-propane	Phase II	0.0002
2,4-D	Phase II	0.07
Ethylene dibromide	Phase II	0.00005
Heptachlor	Phase II	0.0004
Heptachlor epoxide	Phase II	0.0002
Lindane	Phase II	0.0002
Methoxychlor	Phase II	0.04
Polychlorinated biphenyls (PCBs)	Phase II	0.0005
Pentachlorophenol	Phase II	0.001
Toxaphene	Phase II	0.003
2,4,5-TP	Phase II	0.05
Benzo(a)pyrene	Phase V	0.0002
Dalapon	Phase V	0.2
Di(2-ethylhexyl) adipate	Phase V	0.4
Di(2-ethylhexyl) phthalate	Phase V	0.006
Dinoseb	Phase V	0.007

TABLE 3-5 – (continued)

Regulated Synthetic Organic Chemicals (SOC)

Synthetic Organic Chemical	Federal Regulation	Primary MCL (mg/L)[1]
Diquat	Phase V	0.02
Endothall	Phase V	0.1
Endrin	Phase V	0.002
Glyphosate	Phase V	0.7
Hexachlorobenzene	Phase V	0.001
Hexachloro Cyclopentadiene	Phase V	0.05
Oxamyl (vydate)	Phase V	0.2
Picloram	Phase V	0.5
Simazine	Phase V	0.004
2,3,7,8-TCDD (dioxin)	Phase V	3x10-8

(1) 40 CFR 141.61(a) & (c); adopted by State Board of Health.
(2) Delayed; reproposal of MCLs for aldicarb compounds expected in the future.

TABLE 3-6

Regulated Volatile Organic Chemicals (VOC)

Volatile Organic Chemical	Federal Regulation	Primary MCL (mg/L)[1]
Vinyl Chloride	Phase I	0.002
Benzene	Phase I	0.005
Carbon Tetrachloride	Phase I	0.005
1,2-Dichloroethane	Phase I	0.005
Trichloroethylene	Phase I	0.005
para-Dichlorobenzene	Phase I	0.075
1,1-Dichloroethylene	Phase I	0.007
1,1,1-Trichloroethane	Phase I	0.2
cis-1,2-Dichloroethylene	Phase II	0.07
1,2-Dichloropropane	Phase II	0.005
Ethylbenzene	Phase II	0.7
Monochlorobenzene	Phase II	0.1
Ortho-Dichlorobenzene	Phase II	0.6
Styrene	Phase II	0.1
Tetrachloroethylene	Phase II	0.005
Toluene	Phase II	1
Trans-1,2-Dichloroethylene	Phase II	0.1
Xylenes (total)	Phase II	10
Dichloromethane	Phase V	0.005
1,2,4-Trichloro-benzene	Phase V	0.07
1,1,2-Thrichloro-ethane	Phase V	0.005

(1) 40 CFR 141.61(a) and (c); adopted by State Board of Health.

Asbestos

Introduction

Asbestos is the name for a group of naturally occurring, hydrated silicate minerals with fibrous morphology. Included in this group are chrysotile, corcidolite, amosite, and the fibrous varieties of anthophyllite, tremolit, and actinolite. Most commercially mined asbestos is chrysotile. Asbestos' flexibility, strength, and chemical and heat resistance properties that have adapted it to many uses including building insulation, brake linings, and water pipe.

In recent years, there has been much concern with the health risks associated with asbestos. Several studies and case histories have documented the hazards to internal organs as a result of inhalation of asbestos fibers. Data is limited on the effects of ingestion of asbestos fibers or on the effects of inhalation exposure from drinking water. Ingestion studies have not caused cancer in laboratory animals, although studies of asbestos workers have shown increased rates of gastrointestinal cancer.

Monitoring Requirements and Analysis

Asbestos is listed as primary inorganic contaminant; however, it is not routinely included in IOC samples for public water systems. Asbestos monitoring is to be conducted every 9 years unless a waiver is applied for and granted by DOH.

The City has been granted a waiver on asbestos sampling through December 2019.

Radionuclides and Radon

Introduction

Radionuclides include radioactive substances occurring naturally in subsurface waters. Regulated substances include radium-226, radium-228, uranium, and gross alpha and beta particles. Table 3-7 summarizes radionuclide MCLs as defined by EPA's Radionuclide Rule, WAC 246-290-310(7), and 40 CFR 141.66.

TABLE 3-7

Radionuclide MCLs

Radionuclide	MCL
Combined Radium -226 and -228	5 pCi/L
Uranium	30 μg/L
Gross Alpha (excluding uranium and radon)	15 pCi/L
Gross Beta	4 millirem/year

Monitoring Requirements and Analysis

WAC 246-290-300(10) and 40 CFR 141.26 require radionuclide samples once every 4 years. A gross alpha particle activity measurement may be substituted for the required radium-226 and radium-228 analysis provided that the measured gross alpha particle activity does not exceed 5 pCi/L at a confidence level of 95 percent.

The City collected radionuclide samples for radium in August and October 2007, April 2009, and April and August 2010. In all samples the result was below the detection level. The next round of radionuclide testing is required by December 2014.

GWI DETERMINATION

The Department of Health requires groundwater sources to be investigated for potential influence by surface water. This influence can be seen in temperature, conductivity and pH changes. The primary risk from ground water under the influence of surface water (GWI) is microbial contamination. WAC 246-290-640 designates the rules for determination of surface water influence of ground water sources. This rule requires monitoring of the source until a determination has been made. This determination decides the level of disinfection that is necessary to ensure safe drinking water.

When the DOH determines a potential GWI source the Owner of that source is required to provide the DOH with the data necessary to determine the GWI status of the source. This includes water quality data, documentation of source construction characteristics, hydrogeology data, distance to surface water and water quality results from nearby surface waters. This is used by the DOH to determine if the source is hydraulically connected to surface water. If it is hydraulically connected the purveyor must secure the services of a professional engineer to direct further evaluations and actions regarding the source. In addition disinfection in accordance with WAC 246-290-451 is required. To further investigate the nature of the source microscopic particle analysis (MPA) according to a DOH approved schedule will be carried out.

There are two designations used by the Washington State Department of Health for ground water influenced by surface water: ground water under the direct influence of surface water and ground water hydraulically connected to surface water. The latter designation is used only by the State of Washington. GWI water sources must be treated to the same level as a surface water source. Hydraulically connected sources must be disinfected to a CT of 6.

The City's source is not a designated GWI source and a CT of 6 is not required. This was confirmed by Jozef Bezovics, Regional Engineer, Southwest Region DOH, via email on November 10, 2011.

Disinfectants and Disinfection Byproducts Rule

Introduction

WAC 246-290-300(7) requires purveyors of public water systems that provide water treated with chemical disinfectants to monitor for disinfectants and disinfection byproducts. The Disinfection/Disinfectants Byproduct Rule (D/DBP Rule) establishes residual disinfectant concentrations and maximum contaminant levels for disinfection byproducts.

Trihalomethanes (THMs) and five haloacetic acids (HAA5) are a group of organic compounds that can be formed as a result of drinking water disinfection by chlorine and are; therefore, often referred to as disinfection byproducts. Total trihalomethanes (TTHMs) include the sum of the concentrations of four disinfection byproducts: chloroform, bromoform, bromodichloromethane, and dibromochloromethane.

Monitoring Requirements and Analysis

Stage 1 of the D/DBP Rule was published in November 1998 and became effective in 2000. Under Stage 1 of the D/DBP Rule, the MCLs for TTHM and HAA5 is 80 micrograms per liter (µg/L) and 60 µg/L, respectively, and are based on the running average of two annual samples. Systems are required to prepare and implement a disinfection byproducts monitoring plan. The Stage 1 D/DBP Rule will remain in effect for compliance until October 1, 2013.

Stage 2 of the D/DBP Rule was published in January 2006 and compliance with the new regulations begins on October 1, 2013. Under Stage 2 of the D/DBP Rule, the MCLs for TTHM and HAA5 remain 80 µg/L and 60 µg/L, respectively; however, compliance with the MCL is based on the running annual average of each individual sample instead of the running annual average of all samples combined. The number of samples taken is dependant on the population served. Systems serving between 500 and 9,999 people must collect two samples per year and systems serving between 10,000 and 99,999 people must collect four samples per quarter. The City of North Bonneville falls within the first category (500 to 9,999 population served).

Sampling locations are to be determined based on an Initial Distribution System Evaluation (IDSE), unless the City is eligible for a 40/30 certification. This certification is granted to systems for which all Stage 1 D/DBP sample results are below 40 µg/L for TTHM and 30 µg/L for HAA5 and has no monitoring violations. The City applied for and was granted 40/30 certification since the TTHM and HAA5 levels described above are well below the 40 µg/L and 30 µg/L limits, respectively. The City performed TTHM and HAA5 testing at one location in August 2011 with levels under the detection limits, and the next round of testing is required by August 2014.

DESIGN STANDARDS

Performance and design criteria typically address the sizing and reliability requirements for source, storage, distribution, and fire flow. WAC 246-290 contains general criteria and standards that must be followed in development of public water systems. In addition, Washington State Department of Health (DOH) has published its 2001 *Water System Design Manual* that provides more specific guidance for water system design. The design standards for the following subjects are discussed in the order shown below:

General Facility Standards

1. Average and Peak Day Demand
2. Peak Hour Demand
3. Storage Requirements
4. Fire Flow Rate and Duration
5. Minimum System Pressure
6. Minimum Pipe Sizes
7. Backup Power Requirements
8. Valve and Hydrant Spacing Recommended Standard
9. Other System Policies

DOH relies on various publications, agencies and the utility itself to establish design criteria. The following gives a brief description of two of the most widely recognized performance and design standards.

- **WAC 246-290, Group A Public Water Supplies, Washington State Board of Health (January 2010).**

  This is the primary drinking water regulation utilized by the Washington State Department of Health (DOH) to assess capacity, water quality, and overall compliance with drinking water standards.

- **Water System Design Manual (WSDM), Washington State Department of Health (DOH) (August 2001).**

  Significant revisions to the former DOH Sizing Guidelines have been adopted. These standards will serve as guidance for the preparation of plans and specifications for Group A public water systems in compliance with WAC 246-290.

Table 3-8 lists the DOH Water System Design Manual guidance and the City of North Bonneville's policies with regards to each standard for general facility requirements.

TABLE 3-8

City of North Bonneville Water System General Facility Requirements

Standard	DOH Water System Design Manual (August 2001)	City of North Bonneville Standard
Average Day and Maximum Day Demand	Average Day Demand (ADD) should be determined from previous metered water use data. Maximum Day Demand (MDD) is estimated at approximately 2.0 times the average day demand if metered data is not available.	ADD = Metered Production Data MDD = Metered Production Data * *for this Plan only 1 year of MDD is available, so a peaking factor of 3.34 X ADD was used to project future MDD
Peak Hour Demand	Peak hour demand is determined using the following equation: PHD = (MDD/1440)[(C)(N) + F] + 18 C = Coefficient from DOH Table 5-1 N = Number of connections, ERUs F = Factor of range from Table 5-1	System wide peak hour demand was calculated using the formula: PHD = MDD x 2.19
Source	Capacity must be sufficient to meet MDD and replenish fire suppression storage in 72 hours.	Same as DOH Water System Design Manual, Chapter 7.
Storage	The sum of: Operational Storage Volume sufficient to prevent pump recycling. Equalizing Storage $V_{ES} = (Q_{PH} - Q_S) * 150$ Standby Storage $V_{SB} = (2 * ADD * N) - t_m * (Q_S - Q_L)$ Fire Suppression Storage $V_{FSS} = NFF * T$ ADD = average day demand, gpd/ERU N = number of ERU's Q_{PH} = peak hour demand, gpm Q_S = capacity of all sources, excluding emergency sources, gpm Q_L = capacity of largest source, gpm t_m = daily pump source run time, min (1440) NFF = needed fire flow, gpm T = fire flow duration, min	Same as DOH Water System Design Manual, using the formulas provided in the manual, Chapter 9.
Minimum System Pressure	The system should be designed to maintain a minimum of 30 psi in the distribution system under peak hour demand and 20 psi under fire flow conditions during MDD.	Same as DOH Water System Design Manual, Chapter 8.
Fire Flow Standard	The minimum fire flow shall be determined by the local fire authority or WAC 246-293 for systems within a critical water supply service area (CWSSA).	North Bonneville is not in a CWSSA. City standards have been developed by local fire authority.

TABLE 3-8 – (continued)

City of North Bonneville Water System General Facility Requirements

Standard	DOH Water System Design Manual (August 2001)	City of North Bonneville Standard
Minimum Pipe Sizes	The diameter of a transmission line shall be determined by hydraulic analysis. The minimum size distribution system line shall not be less than 6-inches in diameter.	Same as DOH Water System Design Manual.
Reliability Recommendations	• Back-up power equipment for pump stations unless there are two independent public power sources • Provision of multiple storage tanks • Standby storage equivalent to ADD x 2, with a minimum of 200 gpd/ERU • Low and high level storage alarms • Looping of distribution mains when feasible • Pipeline velocities not > 8fps at PHD • Flushing velocities of 2.5 fps for all pipelines	Same as DOH Water System Design Manual, Chapter 5.
Valve and Hydrant Spacing	Sufficient valving should be placed to keep a minimum of customers out of service when water is turned off for maintenance or repair. As a general rule, valves on distribution mains of 12-inches and smaller should be located every 1,000 feet. Fire hydrants on lateral should be provided with their own auxiliary gate valve.	Same as DOH Water System Design Manual.

CONSTRUCTION STANDARDS

Construction standards set forth the actual materials and construction standards that Contractors, Developers, and the City must follow when constructing water system facility improvements. The City follows AWWA and WSDOT Standards for Water System Construction Specifications and Design Standards. The City currently has no Construction Standards for its water system.

SYSTEM COMPONENT ANALYSIS

The following section evaluates the existing water system facilities. They are analyzed based on their capacity, physical conditions, and performance capabilities relative to existing and projected growth conditions.

SOURCE OF SUPPLY ANALYSIS

A description of the City's source of supply was presented in Chapter 1. According to Department of Health Design Standards, source production capacity must be sufficient to

supply the maximum day demand (MDD). Projections for MDD as well as average day demand (ADD) must also comply with the maximum instantaneous and maximum annual withdrawal limitations of associated water rights.

Water Rights Analysis

All appropriations of water for public use within Washington State must be made in accordance with existing water rights and the established procedures that govern their implementation and use. The City's water rights are discussed in Chapter 1 and shown in Table 1-1. A water rights self assessment is included in Appendix B.

Table 3-9 compares the maximum pumping rate from the City's well to the maximum instantaneous withdrawal allowed under the City's existing water right. The City keeps pump run time records and the volume of water pumped during that time, but instantaneous pumping records are not available. City staff have indicated that the pump is set to operate at a maximum of 625 gpm. The well is not operated to exceed the maximum instantaneous withdrawal limitations. However, the well pump is capable of pumping 1, 000 gpm at 100 feet of head per the pump curve.

In Table 3-10, the annual production for the City's wells over the last 5 years of use is compared to the allowed average annual withdrawal designated by existing water rights. As shown in Table 3-11, the annual production for the well is within the maximum annual withdrawal water right.

TABLE 3-9

Historical Instantaneous Production Water Rights Analysis
City of North Bonneville

Source	Maximum Recorded Pumping Capacity (gpm)	Maximum Instantaneous Withdrawal Allowed Under Existing Water Rights (gpm)	Surplus/ (Deficit) (gpm)
Well 1	625	1,000	375

TABLE 3-10

Historical Annual Production Water Rights Analysis
City of North Bonneville

Year	Total Annual Production (ac-ft/yr)	Total Annual Surplus (ac-ft/yr)
2007	213	123
2008	206	130
2009	208	128
2010	176	160
2011	208	128

Table 3-11 compares the projected average annual withdrawal requirement (projected production) with existing water rights. The production values do not take into account any reduction of distribution system leakage that may occur. Based on projected annual withdrawal requirements, the City will have adequate annual withdrawal water rights through the year 2022. With DSL remaining at its current level, additional annual water rights will be required by 2023 if growth occurs as projected. The need for additional water rights can be pushed beyond 2023 by reducing DSL, or obtaining additional annual water rights. As shown in Chapter 4, Water Use Efficiency, by reducing DSL to 10 percent, additional annual water rights will not be required until 2032.

TABLE 3-11

Projected Average Annual Withdrawal Water Rights Analysis
City of North Bonneville

Year	Projected Annual Withdrawal[(1)] (acre-ft/year)	Maximum Annual Withdrawal Rate (acre-ft/year)	Water Rights Surplus/(Deficit) (acre-ft/year)
2012	217	336	119
2013	226	336	110
2014	236	336	100
2015	246	336	90
2016	257	336	79
2017	**268**	**336**	**68**
2018	280	336	56
2019	292	336	44
2020	305	336	31
2021	318	336	18

TABLE 3-11 – (continued)

Projected Average Annual Withdrawal Water Rights Analysis
City of North Bonneville

Year	Projected Annual Withdrawal[(1)] (acre-ft/year)	Maximum Annual Withdrawal Rate (acre-ft/year)	Water Rights Surplus/(Deficit) (acre-ft/year)
2022	332	336	4
2023	346	336	(10)
2024	361	336	(25)
2025	377	336	(41)
2026	393	336	(570
2027	411	336	(75)
2028	428	336	(92)
2029	447	336	(111)
2030	466	336	(130)
2031	487	336	(151)
2032	**508**	**336**	**(172)**

(1) Production values include DSL of 37 percent.

Source Production Capacity Analysis

Table 3-12 shows the range of flow and run times for the well, and the corresponding maximum day production for the year 2011. This table assumes the well operates an average of 24 hours per day and that the well is maintained to produce up to the instantaneous demand allowed by their water right. The maximum pumping capacity into the distribution system is limited by the finished water pump, which pumps from the clearwell at a maximum rate of 600 gpm. This value is used for the following analysis.

Using Table 3-12 as a basis for pumping capacity, Table 3-13 compares the maximum day production capacity to the projected maximum day production requirements through the year 2032.

As shown in Table 3-13, the City has adequate source capacity to serve the projected maximum day demands of the system through 2019. Additional source capacity is required to meet maximum day demands in 2020 if distribution leakage is not reduced and growth occurs as projected.

TABLE 3-12

City of North Bonneville Maximum Source Production

Source	Historical Pumping Capacity (gpm)	Pump Run Time (hours)	Maximum Day Production (gpd)
Well 1	600	4 – 24	864,000

TABLE 3-13

City of North Bonneville Source Production Capacity Analysis
No Reduction in Distribution System Leakage

Year	Maximum Day Production Capacity[(1)] (gal/day)	Projected Maximum Day Production[(2)] (gal/day)	Production Surplus/(Deficit) (gal/day)
2012	864,000	640,278	223,722
2013	864,000	668,073	195,927
2014	864,000	697,192	166,808
2015	864,000	727,303	136,697
2016	864,000	758,738	105,262
2017	**864,000**	**792,158**	**71,842**
2018	864,000	826,571	37,429
2019	864,000	862,307	1,693
2020	864,000	900,360	(36,360)
2021	864,000	939,406	(75,406)
2022	864,000	980,105	(116,105)
2023	864,000	1,022,791	(158,791)
2024	864,000	1,067,130	(203,130)
2025	864,000	1,113,455	(249,455)
2026	864,000	1,162,097	(298,097)
2027	864,000	1,212,723	(348,723)
2028	864,000	1,265,666	(401,666)
2029	864,000	1,320,264	(456,264)
2030	864,000	1,377,839	(513,839)
2031	864,000	1,437,400	(573,400)
2032	**864,000**	**1,500,269**	(636,269)

(1) Maximum day production values from Table 3-12.
(2) From Table 2-14 – assumes no reduction in distribution system leakage.

The projected maximum day production shown in Table 3-13 is based on no reductions in distribution system leakage. The Water Use Efficiency requirements recently instituted by DOH will require the City to meet a DSL standard of 10 percent. Assuming the City meets this standard, the maximum day production requirement will decrease, and the City would not experience a projected deficit until 2028. If the City does not reduce DSL, additional source capacity is required by 2020 in order to meet maximum day demands.

STORAGE ANALYSIS

Introduction

The nominal volume of a water reservoir is generally taken as the amount of water the reservoir could hold if filled all the way to the top of the reservoir wall. However, practically speaking a reservoir cannot be filled to the top of the wall, and a reservoir also cannot, under normal operational conditions, be drained completely. Therefore, there is a need to determine how much of a reservoir volume is effective storage and how much effective storage a water system needs. The DOH Water System Design Manual identifies the following components of reservoir storage volume:

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

A reservoir's effective storage volume is the nominal volume less operational storage and dead storage. This volume must be large enough to accommodate the requirements for equalizing storage, standby storage and fire suppression storage.

Operational Storage (Vos)

Operational storage is the volume of water that flows in and out of a reservoir during normal system control cycling. Reservoirs typically operate with a maximum water level at which all source pumps are turned off, and a minimum level at which all source pumps are turned on. The amount of water that flows into and out of the reservoir between these two levels depends on the particulars of the operations control levels and the dimensions of the system reservoirs.

The City operates its wells using its SCADA system. The well is controlled by the SCADA system and turns on and off based the levels in the Old and New Reservoirs. The finished water pump turns on when the reservoirs reach 27.54 feet and the pump turns off at 29.78 feet. A high level alarm sounds at 31.28 feet and a low level alarm sounds at 24.50 feet. For the purpose of this analysis, operational storage is based the off

level to the on level, a differential depth of 2.24 feet of (29.78 – 27.54 feet) in each of the two reservoirs, which is equivalent to 71,172 gallons, or 35,586 gallons in each reservoir.

Equalizing Storage (Ves)

Equalizing storage is the amount of water needed to meet peak system demand for a period of time that the system demand exceeds the system source capacity. The DOH Water System Design Manual recommends that this volume be estimated as PHD minus source capacity for 150 minutes, but not less than zero.

Equalizing storage is calculated using the following equation:

V_{ES} = $(Q_{PH} – Q_S)$150 minutes
V_{ES} = Equalizing storage component (gallons)
Q_{PH} = Peak hourly demand (gpm)
Q_S = Total source of supply capacity, excluding emergency sources (gpm)

Standby Storage (Vsb)

Standby storage is water held in reserve for emergency situations, such as temporary loss of a water source. The DOH Water System Design Manual recommends that this volume be estimated as two days of average day demand for the water system, less the amount of water that can be produced by the water system in one day with the largest source of supply out of service, but not less than 200 gallons per ERU.

Standby storage is calculated using the following equation:

SB_{TMS} = $(2 \text{ days})(ADD)(N) – t_m(Q_s – Q_L)$
SB_{TMS} = Total standby storage component for a multiple source system (gallons)
ADD = Average day demand for the system (gpd/ERU)
N = Number of ERUs
Q_s = Sum of all installed and continuously available source of supply capacities, except emergency sources (gpm)
Q_L = Capacity of the largest single source serving the system (gpm)
t_m = Maximum time remaining sources will be allowed to pump per day

Standby storage requirements will vary according to the number of connections and is a function of source capacity and reliability. The assumed total source capacity, 600 gpm.

Fire Suppression Storage (Vff)

Fire suppression storage is provided to ensure that the volume of water required for fighting fires is available when necessary. Fire suppression storage also reduces the impact of fire fighting on distribution system water pressure. The amount of water

required for fire fighting purposes is specified in terms of rate of flow in gallons per minute (gpm) and an associated duration. Fire flows must be provided at a residual water system pressure of at least 20 pounds per square inch (psi).

Fire suppression storage is calculated using the following equation:

$FSS = (FF)(t_m)$
FSS = Required fire suppression storage component (gallons)
NFF = Required fire flow rate, as specified by fire protection authority (gpm)
t_m = Duration of FF rate, as specified by fire protection authority (minutes)

The standby storage component or the fire suppression storage component, whichever volume is smaller, can be excluded from a water system's total storage requirement provided that such practice is not prohibited by: (1) a locally developed and adopted Coordinated Water System Plan; (2) local ordinance; or (3) the local fire protection authority or County Fire Marshal (reference WAC 246-290-235(4)). The City's current policy is to allow nesting of these components.

This analysis assumes the City will provide the water storage capacity necessary to provide a fire flow of 1,000 gpm for 60 minutes.

Table 3-14 compares the existing capacity of the City's reservoirs with projected storage volume requirements. Without nesting of standby and fire flow storage the City requires a storage volume of 416,700 gallons in 2012 using the two reservoirs together.

Minimum System Pressure and Dead Storage

WAC 246-290-230(5) requires water systems to provide the peak hour flow at a pressure of 30 psi or higher when all equalizing storage is depleted. Based on the operational set points of the reservoirs, 27.54 feet is the bottom of the Operational Storage Level. Since the base elevation is at 210.83 feet, the bottom of the operational storage level is 238.37 feet.

Equalizing storage in year 2032 is 221,000 gallons, which comes from both reservoirs. This volume equates to 7.0 feet of water in each reservoir. Accordingly, the bottom of Equalizing Storage is 231.37 feet. Since 30 psi is equivalent to 69 feet of hydraulic head, there should be no connections above an elevation of 162.37 feet. The City's highest service connection is the Bonneville Hot Springs at an elevation of 150 feet.

WAC 246-290-230(6) requires water systems to provide the maximum day demand flow at a pressure of 20 psi system pressure (46 feet of hydraulic head) when Fire Suppression Storage and Equalizing Storage is depleted. Per the DOH Water Design Manual, Standby Storage is included in the depleted storage volume that establishes the 20 psi gradeline. If nesting is allowed, the bottom of the Standby Storage Level in year 2032 is 213.47 feet and the 20 psi gradeline is 167.47 feet.

Table 3-14 assumes 2 feet of dead storage exists in the City's reservoirs. Per discussions with City staff, there have been no complaints of low pressures in the water system. Table 3-14 indicates that the City has a storage surplus through the 20 year planning period.

TABLE 3-14

City of North Bonneville Storage Analysis Summary

Year	Vos[(1)] (gal)	Ves[(2)] (gal)	Vsb[(3)] (gal)	Vff[(4)] (gal)	Total (gal)	Available Storage (gal)	Storage Surplus/(Deficit) (gal)
2012	71,200	42,800	242,700	60,000	416,700	953,200	536,500
2013	71,200	48,500	253,200	60,000	432,900	953,200	520,300
2014	71,200	54,600	264,200	60,000	450,000	953,200	503,200
2015	71,200	60,800	275,700	60,000	467,700	953,200	485,500
2016	71,200	67,300	287,700	60,000	486,200	953,200	467,000
2017	**71,200**	**74,300**	**300,200**	**60,000**	**505,700**	**953,200**	**447,500**
2018	71,200	81,400	313,300	60,000	525,900	953,200	427,300
2019	71,200	88,800	326,900	60,000	546,900	953,200	406,300
2020	71,200	96,700	341,200	60,000	569,100	953,200	384,100
2021	71,200	104,800	356,000	60,000	592,000	953,200	361,200
2022	71,200	113,200	371,500	60,000	615,900	953,200	337,300
2023	71,200	122,100	387,600	60,000	640,900	953,200	312,300
2024	71,200	131,300	404,500	60,000	667,000	953,200	286,200
2025	71,200	140,900	422,100	60,000	694,200	953,200	259,000
2026	71,200	150,900	440,400	60,000	722,500	953,200	230,700
2027	71,200	161,400	459,600	60,000	752,200	953,200	201,000
2028	71,200	172,400	479,600	60,000	783,200	953,200	170,000
2029	71,200	183,700	500,400	60,000	815,300	953,200	137,900
2030	71,200	195,700	522,200	60,000	849,100	953,200	104,100
2031	71,200	208,000	544,900	60,000	884,100	953,200	69,100
2032	**71,200**	**221,000**	**568,600**	**60,000**	**920,800**	**953,200**	**32,400**

(1) Vos = Volume of operational storage
(2) Ves = Volume of equalizing storage
(3) Vsb = Volume of standby storage
(4) Vff = Volume of fire suppression storage

TREATMENT

The City of North Bonneville treats its source with a gas chlorination system located at the well. This system has previously been cited by DOH as possibly being non-compliant with safety requirements pertaining to the storage and use of chlorine gas. The City also treats with sodium silicate for iron and manganese.

On July 1, 2004, the State of Washington adopted the International Fire Code and International Building Code. The IBC adoption is codified under WAC 51-50-03 and the

IFC adoption is codified under WAC 51-54-03. Under the IBC and IFC, requirements for use and storage of hazardous chemicals are based on hazard class and threshold quantities. When a chemical is present in amounts greater than its threshold amount, the following requirements become necessary:

- Fire protection (sprinklers)
- Leak detection and containment
- Setbacks from other buildings and public use areas
- Ventilation
- Alarms (for chemical leaks and fires)
- Emergency power

Under the IFC/IBC, the threshold quantity of chlorine gas for exemption from IFC/IBC requirements is 10 pounds. The City currently keeps a minimum of two 150 lb chlorine cylinders as part of its chlorination system, which exceeds the exempt quantity. To continue use of the chlorine gas system and comply with IFC/IBC requirements would require that the City evaluate setback requirements, install ventilation systems, provide alarms and containment for accidental release and provide a permanent emergency power system at the chlorination facilities.

The City has expressed a desire to convert to bulk sodium hypochlorite for its disinfection process. The IFC/IBC threshold quantity for sodium hypochlorite with a concentration greater than 5 percent is 500 gallons.

Since the publication of this Plan, the City has installed a sodium hypochlorite system for disinfection.

DISTRIBUTION SYSTEM HYDRAULIC ANALYSIS

The development of a computer hydraulic model, which can accurately and realistically simulate the performance of a water system in response to a variety of conditions and scenarios, has become an increasingly important element in the planning, design, and analysis of municipal water systems. The Washington State Department of Health's WAC 246-290 requires hydraulic modeling as a component of water system plans.

Hydraulic Modeling Software

The City's water system was analyzed using MWHSoft's H2OMap hydraulic modeling software, which operates in a GIS computer-aided design and drafting environment. The H2OMap model was created from the City's water system base map.

The H2OMap model is configured with a graphical user interface. Each water system element, including pipes, valves, pumps, and reservoirs, is assigned a unique graphical representation within the model. Each element is assigned a number of attributes specific

to its function in the actual water system. Typical element attributes include spatial coordinates, elevation, water demand, pipe lengths and diameters, and critical water levels for reservoirs. With attributes of each system element as the model input, the H2OMap software produces the model output in the form of flows and pressures throughout the simulated water system.

Model Assumptions

Prior to the calibration of the hydraulic model, the basic layout of the water system is recreated within the model. The lengths, diameters, and connection points of system piping are assigned using an updated base map of the water system. The locations of water mains and normally closed valves are found on water system base maps, while the critical elevations of the City's reservoirs are obtained from City officials. The assumptions regarding the modeling of the City's water sources, and the system demands are included in the following sections.

System Demands

A key element in the hydraulic modeling process is the distribution of demands throughout the water system. Total demand on the system is based on the existing and projected demands from Chapter 2. Existing demands were distributed uniformly throughout the water system.

Five demand sets were used in the hydraulic analysis.

- 2011 Average Daily Demands: These demands were used while calibrating the model.
- 2017 Peak Hour Demands: These demands were used to verify the system is able to meet the DOH standards to supply domestic water at a minimum system wide pressure of 30 psi within the 6-year planning period.
- 2017 Maximum Day Demands: These demands were used to evaluate the system's ability to meet the maximum day demands plus required fire flows at DOH's requirement of 20 psi within the 6-year planning period.
- 2032 Peak Hour Demands: These demands were used to verify the system is able to meet the DOH standards to supply domestic water at a minimum system wide pressure of 30 psi within the 20-year planning period.
- 2032 Maximum Day Demands: These demands were used to evaluate the system's ability to meet the maximum day demands plus required fire flows at DOH's requirement of 20 psi within the 20-year planning period.

Model Calibration

The calibration of a hydraulic model provides a measure of assurance that the model is an accurate and realistic representation of the actual system. The hydraulic model of the City's water system was calibrated using data obtained from fire hydrant tests at various locations throughout the water system. Two fire hydrant tests were taken, with the assistance of City personnel, on December 16, 2011. During these tests, static and residual pressures were recorded as City staff opened hydrants and recorded the flow rate. Field results were used to calibrate the hydraulic model through verification and adjustment of pipe type, sizes, roughness coefficients, and elevations. Additionally, the City provided a fire flow testing report from late 2001 that was also used for calibration.

A description of each testing location is presented in Table 3-15.

TABLE 3-15

City of North Bonneville Fire Hydrant Testing Locations

Test Number	Node Number	Testing Location
1	J-11 (Flow)	Sun Tillikum – due east of pressure location
	J-43 (Pressure)	Sun Tillikum – end of cul-de-sac
2	J-32 (Flow)	396 Evergreen Drive
	J-31 (Pressure)	396 Evergreen Drive
City	J-xx (Flow)	Evergreen Drive at Hamilton Rd
	J-xx (Pressure)	Evergreen Drive

The system conditions at the time of each test were recorded. At the time of testing, the reservoirs were at an elevation of 28.65 feet and no pumps were running. The system conditions at the time of testing were replicated in the hydraulic model during the calibration process.

Using the system conditions for each hydrant test, the hydraulic model was used to generate static pressure and residual pressure at the measured hydrant flow rate. The total system demand at the time of the hydrant tests was assumed to be the average day demand for 2011. Model output was generated at points in the model equivalent to the locations of the hydrant tests.

Model output for static pressure was generated by running the model at 2011 average day demands. Model output for residual pressure was generated at each hydrant test location by placing an added demand equal to the measured hydrant flow rate and recording the resulting pressure.

The system pressures and pipe flow rates determined in the hydraulic analysis are highly dependent on the friction loss characteristics established for each pipe. The friction

losses occurring in lengths of pipe and various valves are accounted for in the hydraulic model. The friction factors for the pipes in the modeled system are adjusted throughout the calibration process until the model output best approximates the measured values. Hazen-Williams C-factors between 110 and 160 are used throughout the system. These friction factors are typical values for most pipe and are generally conservative. The friction factors for the pipe also compensates for system losses through valves and pipe fittings.

The model output was produced for two data comparisons, static pressure and residual pressure. The values measured in the hydrant flow tests are compared to the model output values in Table 3-16.

TABLE 3-16

City of North Bonneville Water System Modeling Calibration Results

Test No.	Flow (gpm)	Static Pressure (psi)			Residual Pressure (psi)		
		Field	Model	Difference	Field	Model	Difference
1	1,198	79	80	1	72	70	2
2	1,210	79	80	1	70	71	1
City	1,035	80	80	0	72	70	2

Hydraulic models are required to be within 5 psi of measured pressure readings for long range planning, according to the DOH Design Manual, Table 8-1. Calibration of the hydraulic model produced results that are within 3 psi of actual field test data for static pressure. Modeled residual pressures are within 5 psi of measured field data.

Model Input

Model input assumptions have significant impacts on peak hour and fire flow results. Table 3-17 shows the levels of each reservoir during the three model scenarios.

TABLE 3-17

City of North Bonneville Reservoir Levels During Model Scenarios

Year	Old Reservoir			New Reservoir		
	2011	2017	2032	2011	2017	2032
Reservoir Height [feet]	32	32	32	32	32	32
Peak Hour Scenario Height [feet]	27.75	27.15	22.75	27.75	27.15	22.75
Fire Flow Scenario Height [feet]	25.86	25.26	20.86	25.86	25.26	20.86

Peak Hour Demand Modeling Results

According to WAC 246-290, a water system must maintain a minimum pressure of 30 psi in the distribution system under peak hour demand conditions. The City's existing distribution system has been modeled under 2011, 2018, and 2032 peak hour demand conditions. The pressures of these scenarios are presented in Appendix E. Under 2028 peak hour demand conditions, the system is capable of meeting the minimum pressure requirements. Figure 3-1 shows system pressures during peak hour demand in 2017.

The system is capable of meeting projected peak hourly demands, shown in Table 2-13, using Well 1 and equalizing storage from the Reservoirs. The 2032 peak hour demand of 2,073gpm is met with 600 gpm from Well 1 and 1,473 gpm from the Reservoirs. This equates to approximately 88,400 gallons that the reservoirs will supply the system during a typical peak hour in 2032. As shown in Table 3-14, there is 221,000 gallons of equalizing storage dedicated to meeting peak hour demands in 2032.

Fire Flow Modeling Results

The DOH Water System Design Manual states that a water system should be designed to provide adequate fire flow under maximum day demand conditions, while maintaining a minimum pressure of 20 psi. All of the demand nodes in the hydraulic model are capable of providing 1,000 gpm of fire flow. Figure 3-2 shows available fire flows in 2017.

Complete fire flow results are located in Appendix E.

CITY OF NORTH BONNEVILLE SYSTEM DEFICIENCIES

Existing and future system deficiencies are discussed below and summarized in Table 3-18.

WATER RIGHTS AND SOURCE OF SUPPLY

The City has adequate water rights from its own sources to meet average annual demands through 2022. This assumes no reduction of DSL from the current rate of 37 percent. If DSL is reduced to 10 percent by 2021, as projected in Chapter 4, average annual demands will be met by the existing water rights through 2031. The City has adequate instantaneous water rights from its own source for current and projected maximum day demands through 2031 if distribution system leakage remains at its current level of 37 percent. Additional instantaneous source capacity is required in 2032 to meet projected maximum day demands.

Although the City has adequate water rights to meet annual demands through 2022 and instantaneous demands through 2031, the system cannot physically deliver this volume of

N

0 1,600 3,200
Feet

WELL #1

OLD RESERVOIR

NEW RESERVOIR

HAMILTON CREEK

GREENLEAF CREEK

TULE LAKE

BURLINGTON NORTHERN RR

BASS LAKE

2nd
POWERHOUSE

SR-14

CASCADE
ISLAND

COLUMBIA RIVER

GREENLEAF LAKE

CASCADE DR.

EVERGREEN DR.

BONNEVILLE DAM
AND SPILLWAY

BRADFORD ISLAND

1st POWERHOUSE

PIERCE WILDLIFE REFUGE

WASTEWATER
TREATMENT
FACILITY

LEGEND:

PHD System Pressures
- 70-80 psi
- 81-90 psi
- City Limits
- Water Service Area
- Streams
- Reservoir
- Well
- Hydrant
- Water Lines

CITY OF NORTH BONNEVILLE

WATER SYSTEM PLAN
FIGURE 3-1
2017 PHD SYSTEM PRESSURES

Gray & Osborne, Inc.
CONSULTING ENGINEERS

ORTHO SOURCE: THE NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) 2009

M:\North Bonneville\11241 - WSP\GIS\FIG1-2 WATER_FACILITIES.mxd

N

0 1,600 3,200
Feet

WELL #1

NEW RESERVOIR

OLD RESERVOIR

BURLINGTON NORTHERN RR

BASS LAKE

2nd POWERHOUSE

SR-14

CASCADE ISLAND

COLUMBIA RIVER

BONNEVILLE DAM AND SPILLWAY

BRADFORD ISLAND

1st POWERHOUSE

GREENLEAF CREEK

TULE LAKE

HAMILTON CREEK

GREENLEAF LAKE

CASCADE DR.

EVERGREEN DR.

SR-14

COLUMBIA RIVER

PIERCE WILDLIFE REFUGE

HAMILTON CREEK

WASTEWATER TREATMENT FACILITY

LEGEND:

Fire Flow Availability

- 1000-1250 gpm
- 1251-1500 gpm
- 1501-2000 gpm
- 2001-2500 gpm
- 2501-3000 gpm
- >3000 gpm
- City Limits
- Water Service Area
- Streams
- Reservoir
- Well
- Hydrant
- Water Lines

CITY OF NORTH BONNEVILLE

WATER SYSTEM PLAN
FIGURE 3-2
2017 FIRE FLOW AVAILABILITY

Gray & Osborne, Inc.
CONSULTING ENGINEERS

ORTHO SOURCE: THE NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) 2009

M:\North Bonneville\11241 - WSP\GIS\FIG1-2 WATER_FACILITIES.mxd

water because it is limited by the finished water pump from the clearwell at the well house. This pump is only capable of supplying 600 gpm into the distribution system. If the distribution system leakage standard is not met and the City relies completely on its own sources of supply, the maximum day demand is projected to exceed the source capacity by 2020. The City shall develop a hydro geologic report on the existing well to determine if the existing well could be expanded to supply the full water right of 1,000 gpm.

The City has a single well, and for reliability purposes, would like to develop an additional well. The hydro geologic study will indicate if the existing well can be expanded to utilize the full water right to meet maximum day demands, and determine if an additional well can be developed at a different site to provide redundancy and meet maximum day demands. Another option to increase redundancy and meet maximum day demands is to develop an intertie with Bonneville Dam or the Golf Course.

The existing well is equipped with emergency power capability. The City's operating staff would also like to have additional telemetering capabilities to include flow rate, totalized flows and water level.

STORAGE

The City will have adequate storage capacity during the planning period. The age and condition of both reservoirs are adequate and do not require any upgrades at this time. Reservoir painting for the old welded steel reservoir, has a lifespan of 20 to 25 years. Repainting is included in the 20-year planning period.

TREATMENT

To eliminate safety concerns and avoid significant regulatory requirements associated with continued use of chlorine gas, the City will replace its gas chlorination system with a bulk sodium hypochlorite system. The sodium hypochlorite system will consist of a sodium hypochlorite drum (55 gallons) and metering pump. To mitigate safety and health issues associated with potential off gassing of chlorine from the sodium hypochlorite, it is also recommended that a small louver and fan be provided.

The City should also consider connecting its chlorine analyzer to the SCADA system to ensure that an adequate dose is maintained for a detectable chlorine residual.

DISTRIBUTION SYSTEM

There is piping in the system that will reach the end of its design life in the planning period and will be due for replacement. Pipe replacement will also aid in the reduction of distribution system leakage. The 5,250 foot 14-inch transite line from the reservoirs should be replaced or a parallel line should be installed. These measures are also expected to help reduce DSL in the distribution system.

Other items to aid in the reduction of DSL include a leak detection study, source meter evaluation, and meter replacement program.

DEFICIENCY SUMMARY AND TIMELINE FOR CORRECTIONS

Table 3-18 summarizes the deficiencies of the water system with respect to source of supply, water rights, storage, and booster station facilities and gives a timeline of when those deficiencies will occur.

TABLE 3-18

Timeline of Correcting Deficiencies City of North Bonneville Water System

Year	Improvement
2012	• Conduct leak detection survey
2012	• Source meter evaluation
2012	• Meter Replacement Program
2012	• Replace Chlorine Gas Disinfection System with Bulk Sodium Hypochlorite
2013	• Pursue Intertie with Bonneville Dam and Golf Course
2013	• Water rights application for additional point of withdrawal
2013	• Hydro geologic Investigation
2017	• Design and construct new well source for reliability
2018	• Well No. 1 Capacity Upgrade
2018	• Construct parallel 14-inch line to the replace the transite line to the reservoirs.
2019	• Telemetry Upgrades for existing well
2026	• Repaint Old Reservoir

Table 3-19 summarizes the capacity of the water system components using equations found in Chapter 6 of the DOH Water System Design Manual. Two sets of capacities are shown. The first assumes the 2011 DSL rate of 37 percent. The second set assumes DSL has been reduced to 10 percent in the ERU.

TABLE 3-19

Water System Component Capacities, City of North Bonneville Water System

Water System Component	Capacity (ERU)	Year Capacity is Exceeded
10 Percent Distribution System Leakage[(1)]		
Annual Water Rights (336 ac-ft/yr)	1,807	Beyond 2032
Instantaneous Water Rights (1,000 gpm)	2,628	Beyond 2032
24-hour Pumping Capacity (600 gpm)	1,577	Beyond 2032
Capacity-Related Storage	3,235	Beyond 2032
37 Percent Distribution System Leakage – Unchanged[(2)]		
Annual Water Rights (336 ac-ft/yr)	1,255	Beyond 2032
Instantaneous Water Rights (1,000 gpm)	1,820	Beyond 2032
24-hour Pumping Capacity (600 gpm)	1,092	2030
Capacity-Related Storage	2,198	Beyond 2032

(1) Average Day ERU = 166 gpd/ERU; Maximum Day ERU = 548 gpd/ERU.
(2) Average Day ERU = 239 gpd/ERU; Maximum Day ERU = 791 gpd/ERU.

CHAPTER 4

WATER USE EFFICIENCY PROGRAM

OBJECTIVE

The objectives of this chapter are to identify water use efficiency requirements pertaining to the City of North Bonneville, evaluate past water conservation efforts, and describe the City's water use efficiency plan for the next 6 years.

WATER USE EFFICIENCY PLANNING REQUIREMENTS

The Washington Legislature passed the Water Use Efficiency Act of 1989 (43.20.230 RCW), which directs DOH to develop procedures and guidelines relating to water use efficiency. In response to this mandate, Ecology, the Washington Water Utilities Council, and DOH jointly published a document titled *Conservation Planning Requirements* (1994). This document provides guidelines and requirements regarding the development and implementation of conservation programs for public water systems. Conservation programs developed in compliance with this document are required by DOH and by Ecology as part of a public water system water right application. Conservation must be evaluated and implemented as an alternate source of supply before state agencies approve applications for new or expanded water rights.

The *Conservation Planning Requirements* establish varying implementation requirements based on the number of connections served by the water system. A small system is defined as serving less than 1,000 service connections and a medium system serves between 1,000 and 25,000 service connections. In 2011, the City's water system served a total of 344 connections, and therefore qualifies as a "small" public water system. Water conservation measures include water use data collection, water demand forecasts, public education, technical assistance, water metering, conservation incentives, and a water conservation plan.

In 2003, the Municipal Water Supply – Efficiency Requirements Act (Municipal Water Law) was passed and amended RCW 90.46 to require additional conservation measures. The Municipal Water Law, among other things, directed DOH to develop the Water Use Efficiency (WUE) requirements, which was adopted in October 2006.

The WUE requirements are an extension to the *Conservation Planning Requirements* and sets more stringent requirements for public water purveyors. The WUE requirements are comprised of four sections:

1. Planning requirements.
2. Distribution leakage standard.
3. Metering requirements.

4. Goal setting and performance reporting requirements.

The WUE requirements were recently codified in WAC 246-290-800. DOH published a Water Use Efficiency Guidebook in January 2011. Table 4-1 is taken from the DOH Water Use Efficiency Guidebook and lists new elements under the Water Use Efficiency requirements required for municipal water suppliers serving fewer than 1,000 connections.

TABLE 4-1

Water Use Efficiency Requirements Fewer than 1,000 Connections

Requirement	Deadline
Begin Collecting Production and Consumption Data	January 1, 2008
Include WUE Program in Planning Documents	January 22, 2008
Set WUE Goals	January 2, 2009
Submit Service Meter Installation Schedule	July 1, 2009
Submit First Annual Performance Report	July 1, 2009
Meet Distribution Leakage Standard (based on 3-year rolling average)	July 1, 2011
Complete Installation of All Service Meters	January 22, 2017

This chapter of the Plan discusses how each of the requirements listed in Table 4-1 is currently met or will be met through the implementation of the City's WUE program.

COLLECTION OF PRODUCTION AND CONSUMPTION DATA

Water production is measured at the well and recorded on a daily basis on a year round basis, including on holidays.

All service meters are read every other month.

The City collects all water production, purchase and consumption information for its water system and has met this requirement.

WATER USE EFFICIENCY PROGRAM IN PLANNING DOCUMENTS

This chapter of the City's Water System Plan incorporates the City's WUE Program into the City's Water System Plan. When this Plan is adopted by the City and approved by DOH, this goal will be met.

WUE planning elements that must be addressed in the Water System Plan are listed below along with where the element is addressed is in parentheses.

- Evaluate Historical Data (Chapter 2 of this Plan).
- Forecast Demand (Chapter 2 of this Plan).

- Evaluate WUE Measures (Chapter 4 of this Plan).
- Calculate Distribution System Leakage (Chapter 2 and 4 of this Plan).
- Implement a WUE Program (Chapter 4 of this Plan).

Evaluating WUE measures is integral to the goal setting process. The following lists mandatory WUE measures and whether the City has implemented these measures:

- Install production (source) meters – completed.
- Install consumption (service) meters – completed.
- Perform meter calibration – underway.
- Implement a water loss control action plan – underway.
- Educate consumers about WUE practices – underway.

The following WUE measures must be evaluated:

- Evaluate rates that encourage water demand efficiency – completed.
- For systems with more than 1,000 connections, evaluate reclaimed water opportunities – not required for the City of North Bonneville.

The following measures count as a WUE measure:

- Conservation Rate Structures.
- Reclaimed Water Evaluation.
- Customer Leak Prevention Education.
- Educating Customers on Importance of WUE.

Each WUE measure implemented by customer class counts as one measure implemented.

The number of WUE measures that must be implemented varies by total number of service connections. Systems with fewer than 500 connections must only evaluate one WUE measure. The City currently has 344 service connections and, therefore, only needs to evaluate one WUE measure. The City has evaluated and implemented conservation rate structures for both its residential and non-residential customer classes, which counts as two measures. Additionally, the City notifies customers when they suspect a leak and hands out conservation pamphlets. Therefore, the City has met this requirement.

WATER USE EFFICIENCY GOALS

The goal setting element of the WUE program includes the following:

- Establish measurable goals that maintain or reduce water use.
- Set goals through a public forum.

The City intends to establish its goals through this Plan and will meet the public forum requirement prior to adopting this Plan. This will be accomplished by listing the WUE Program of this Plan as a separate agenda item on the regularly scheduled council meeting notice. Goals are established based on an evaluation of historic and projected water production and demands; evaluation of past water conservation measures; and mandated standards such as distribution system leakage. A list of the City's goals and WUE measures to meet those goals are identified and discussed at the end of this chapter.

SERVICE METER INSTALLATION

The City currently meters all services. The City requires all new water customers to install a service meter. This requirement has been met.

ANNUAL PERFORMANCE REPORT

After setting its water use efficiency goals the City must report progress annually. The annual report must include:

- Total source production.
- Distribution system leakage in percentage and volume.
- Goal description, schedule, and progress toward meeting goals.

Goals must include a measurable outcome, address water supply or demand characteristics, and include an implementation schedule. The goal setting process must be held through a public forum and be reevaluated every 6 years. Annual reports must be available to the public and submitted to customers and DOH. Annual reports were due July 1, 2009, and each year thereafter.

The City has been submitting annual performance reports since 2009; this requirement has been met and will continue to be met.

DISTRIBUTION SYSTEM LEAKAGE STANDARD

The *Conservation Planning Requirements* set the maximum allowable rate of lost and unaccounted for water at 20 percent of total source production. The WUE requirements redefine all lost and unaccounted for water as distribution system leakage (DSL) and establish a DSL standard of 10 percent. Distribution system leakage is defined as all unaccounted for water that entered the distribution system, including reservoirs. Known or credibly estimated losses can be excluded from the leakage calculation and may include uses such as construction, firefighting, and flushing.

Distribution system leakage for the City equals the lost and unaccounted for water volume less the amount used for distribution system flushing. The City performs fire hydrant and distribution system flushing and has not metered this activity in the past.

Water used for flushing will be estimated for future distribution system leakage calculations.

Historically, the lost and unaccounted for rate has ranged from 39 to 46 percent (see Table 2-8). The WUE requirements set a standard of 10 percent DSL. Table 4-3 compares forecasted water demand from Table 2-13 with a plan to meet the 10 percent DSL standard.

WATER USE EFFICIENCY PROGRAM DEVELOPMENT AND LEVEL OF IMPLEMENTATION

The following sections describe the City's water use efficiency goals, a description of the conservation measures, and the resulting water use projections.

WATER USE EFFICIENCY GOALS

The City plans to reduce its total water use in two ways.

First, the City will reduce the amount of lost and unaccounted for water, which is now classified by the term distribution system leakage. Reduction will be accomplished with leak detection, source meter calibration, and irrigation education. This approach is effective in reducing the overall source production requirement without affecting the customers' water usage patterns. Second, the City will promote water conservation to reduce water consumption by its customers.

Work on this Water System Plan prompted the City to investigate the high volume of DSL. City employees installed a new meter on the discharge line from the well house to determine the accuracy of the source meter in late 2011. Over a period of 15 minutes, readings were compared from the source meter in the well house, to the new test meter. The source meter read 9,200 gallons, while the test meter read 8,752 gallons. This is a difference of 448 gallons in 15 minutes, or 30 gpm. Thus, the existing source meter appears to be over reading the production of the well by 4.86 percent. Note that the new meter used for comparison was not calibrated. Table 4-2 shows DSL values with the corrected production volume.

TABLE 4-2

DSL with Corrected Production Volume

Year	Production (gallons)	Consumption (gallons)	DSL (gallons)	Percent DSL
2007	66,028,587	37,918,010	28,110,577	42.6%
2008	63,916,384	37,778,169	26,138,215	40.9%
2009	64,392,940	38,439,290	25,953,650	40.3%
2010	54,419,129	34,813,819	19,605,309	36.0%
2011	64,391,418	42,434,074	21,957,344	34.1%

Although DSL values are still well above 10 percent, this discrepancy reduced 2011 DSL by 3 percent.

Goal No. 1 of the water use efficiency program is to reduce lost and unaccounted for water (now termed distribution system leakage) to less than 10 percent of total source production by 2021. In 2011 City could not account for or lost nearly 37 percent of the water it produced. The City will continue on going efforts to accurately track all water used including estimating the amount of water used for fire hydrant and distribution system flushing. Table 4-2 summarizes Goal No. 1. Table 4-3 reflects a mandated standard for reducing DSL.

Goal No. 2 of the water use efficiency program is to reduce the customer consumption by 10 percent over the 20-year planning period. The success of this goal will be measured in terms of the average consumption rate per ERU. Chapter 2 defined the ERU value as 231 gallons per day (gpd) based on the average water consumption of the single-family residential customer class from 2007 to 2011. It should be noted that the ERU defines the *average* water consumption and water usage varies significantly between customers. The City will promote water conservation by its customers by rate increases every year according to the Consumer Price Index. In January 2013, the base rate increased from $17.64 to $20.89. Additionally, the City provides reminders in the newsletter and utility bills. The January 2013 newsletter is included in Appendix C and shows conservation reminders. This is a voluntary Goal.

TABLE 4-3

Projected Average Day Production through the Year 2032
Meeting Distribution System Leakage of 10 Percent (No Conservation)

Year	Consumption (No Conservation) (gpd)	Projected Production No Change in DSL (DSL=37%) (gpd)	Projected Production DSL = 10% by 2021 (gpd)	Average Annual DSL Target (percent)
2011	112,300	179,100	178,300	37
2012	117,200	186,900	180,300	35
2013	122,300	195,100	174,700	30
2014	127,600	203,500	170,100	25
2015	133,200	212,400	166,500	20
2016	138,900	221,500	169,400	18
2017	145,000	231,300	172,600	16
2018	151,300	241,300	175,900	14
2019	157,900	251,800	179,400	12
2020	164,700	262,700	185,100	11
2021	171,900	274,200	191,000	10
2022	179,400	286,100	199,300	10
2023	187,200	298,600	208,000	10
2024	195,300	311,500	217,000	10
2025	203,800	325,000	226,400	10
2026	212,700	339,200	236,300	10
2027	222,000	354,100	246,700	10
2028	231,600	369,400	257,300	10
2029	241,700	385,500	268,600	10
2030	252,200	402,200	280,200	10
2031	263,200	419,800	292,400	10
2032	274,600	438,000	305,100	10

Regional Conservation Programs

There are currently no regional conservation programs in place.

EVALUATION AND SELECTION OF WATER USE EFFICIENCY MEASURES

The *Conservation Planning Requirements* identifies several conservation measures for water systems. The following sections describe the water use efficiency measures evaluated and indicate which have been or will be implemented by the City.

Source and Service Metering

As stated previously, the City currently meters all customers and sources. However, the source meters at the well are believed to be unreliable. The City will have the well source meter and the finished water meter calibrated to determine their accuracy. The City plans to meter all new customers and sources.

Leak Detection

As the rate of lost and unaccounted for water is better defined, the City plans to implement a leak detection program. A leak detection company will complete a survey of the City's entire water system. This will take approximately 2 days to accomplish. The data received from the leak detection survey will indicate areas within the distribution system that require replacement. The program will be focused on areas suspected of leaks and in areas of aging infrastructure.

Irrigation Education

On the consumption side of water use, irrigation efficiency is a method to decrease water usage. Per the Handbook of Water Use and Conservation by Amy Vickers, published by WaterPlow Press in 2001, there are landscaping planning techniques that useful in reducing water use. The fundamentals of water-wise landscaping, according to the Handbook of Water Use and Conservation include: grouping plants according to their water needs, using native and low water use plants, limit turf areas, use efficient irrigation systems, schedule irrigation, ensure healthy soil, remember to mulch, and provide regular maintenance. Site preparation for landscaping in new developments can increase soil water retention and allow plants to grow with less water. The City may consider implementing irrigation and landscaping requirements to reduce water consumption.

Program Promotion

The City promotes its water use efficiency program by providing inserts into its utility bills. The inserts inform the customer of ways they can reduce their water demands and also educate customer of the ways the City is working to improve system efficiency. Additional information is provided in the *Annual Drinking Water Quality Report.* The City will continue to distribute water use efficiency information to its customers.

Conservation Pricing

The City has adopted a rate structure to promote conservation by its customers. The City charges a base rate of $17 per month for all connections. Multi-family units are charged $17 per month, multiplied by the number of units in the building. In addition to the base rate, the City charges $1.66 per 100 cubic feet of water for all customers in 2011. On

January 1 every year, the rate shall increase according to the Consumer Price Index for All Urban Consumers as of August of the previous year, rounded to the nearest penny.

This rate structure gives incentive for all customers to conserve water use.

IMPACTS ON CAPITAL IMPROVEMENTS

Reducing DSL to 10 percent by 2021 will have an impact on the capital improvement plan. Additional source capacity is required by 2020 if the City's DSL remains at the current rate of 37 percent. If the DSL reduction goal of 10 percent by 2021 is met, then additional source capacity is not required until 2028.

PERFORMANCE MEASURES FOR THE 6-YEAR PLANNING PERIOD

The City will take several steps to reduce DSL in the 6-year planning period. As shown in the Capital Improvement Plan (CIP) in Chapter 7, the City plans to perform a leak detection survey and source meter evaluation in 2013. The leak detection survey will indicate areas in the distribution system that that require repair and the City will take immediate action to repair these leaks. The City will continue to monitor DSL on a monthly basis as distribution improvements are made to track the effectiveness of these improvement measures. They will continue to submit annual DSL reports to DOH.

If the leak detection and repairs do not yield a reduction in DSL, or the source meter study indicates problems with the existing installation, then the City will seriously consider installing a new source meter.

Additional measures to be implemented in the 6-year planning period include meter replacement, general distribution system improvements, and conservation pricing.

If these improvement measures do not reduce the City's DSL to 18 percent by 2016 (as shown in Table 4-3), then the City will begin funding applications and design for the reservoir transmission main replacement.

CHAPTER 5

SOURCE WATER PROTECTION

INTRODUCTION

This chapter presents the City of North Bonneville's Wellhead Protection Plan.

This program was developed to help protect the City's source of supply by identifying possible pollutant sources within the zones of contribution of the City's well that may affect source water quality. Protection of the City's source can be accomplished through monitoring, to the best extent possible, all potential contaminant sources and limiting future development within the wellhead protection area that could adversely affect the City's source of supply. Specific criteria against which the adequacy of source water protection is measured are presented in WAC 246-290-135.

WELLHEAD PROTECTION PROGRAM

The City of North Bonneville intends to reduce the potential risk for contamination of groundwater within the identified wellhead protection area by implementing a wellhead protection program. The program identifies potential contaminant sources, describes procedures for notifying the potential contaminant sources of their location within the wellhead protection area, identifies actions to protect the groundwater supply, and defines local spill response procedures for spill incidents within the wellhead protection area.

PROGRAM DEVELOPMENT AND IMPLEMENTATION

The purpose of a wellhead protection program is to provide local utilities with a program for preventing groundwater contamination. A successful wellhead protection program consists of a number of components that must be developed before the plan can be fully implemented. The major components of the plan are described below and form the basis of the chapter that follows:

- A Susceptibility Assessment determining the susceptibility to contamination.
- A Delineated Wellhead Protection Area based on all reasonably available hydrogeologic information, including an assessment of susceptibility to contamination.
- An Inventory of all known and identifiable potential contamination sources within each wellhead protection area.

- A Spill Response Plan for each wellhead protection area containing documentation for coordination with local first responders (police, fire, HAZMAT team, etc.).

- Contingency Plans for providing alternative sources of drinking water in the event of contamination.

- A Wellhead Protection Area Management Plan to reduce the likelihood that potential contaminant sources will pollute the drinking water supply.

SUSCEPTIBILITY ASSESSMENT

Completion of a susceptibility assessment is an important initial step in selecting appropriate delineation methods to define wellhead protection area boundaries. Completion of the susceptibility assessment and submittal to the Department of Health (DOH) allows for a susceptibility ranking. Sources that receive low susceptibility ratings receive susceptibility waivers from DOH to reduce or waive the amount of required monitoring for volatile organic compounds (VOCs) and synthetic organic compounds (SOCs). Depending on factors such as well construction, casing, and location in a geologic setting, drinking water supplies vary in their susceptibility to contaminants discharged at the surface. Wells that have been poorly constructed or have been improperly cased have an increased susceptibility. Additionally, wells located in a geologic setting where no confining layer (aquitard/layer of low permeability) exists between the aquifer and surface have a much higher susceptibility than those drawing water from deep below the surface, with impermeable layers overlying the aquifer.

The City of North Bonneville has completed a susceptibility assessment survey form for its well. The form is included in Appendix F.

WELLHEAD PROTECTION AREA

The purpose of delineating a wellhead protection area is to estimate the area capable of contributing contaminants to a pumping well. These areas are referred to as zones of contribution and provide a basis for focusing a community's groundwater protection efforts. Multiple methods are used to delineate zones of contributions. A groundwater model simplifies the characteristics of an aquifer in order to provide mathematical estimates of actual conditions. As the groundwater model is increasingly simplified, the model becomes easier to use, but the results become less accurate. The most commonly accepted groundwater models for delineating a Wellhead Protection Area (WHPA), or zone of contribution, are the Calculated Fixed Radius (CFR), Analytical, and Numeric models.

The simplest groundwater model is based on the CFR method. In the CFR method, the delineations are concentric areas around each well that are calculated based on pumping data and known or assumed aquifer characteristics.

An Analytical model requires basic hydrogeologic information including the direction of groundwater flow, gradient, and certain physical characteristics of the aquifer. These physical characteristics include the aquifer thickness, the rate at which the aquifer will transmit water (transmissivity), and whether the aquifer is confined or unconfined.

A Numeric model requires significantly more data than other methods. In Numeric modeling, a grid is superimposed over the study area. Each square in the grid, called a cell, is characterized by physical parameters that are estimated from data collected from a variety of sources. The sources may include well logs, geologic and hydrogeologic maps, geophysical data, groundwater elevation data, stream flow discharge, and meteorological data. The parameters used to define the hydrogeological characteristics of each cell in the study area include identification of the vertical relationship of each aquifer and confining layer, the transmissivity of each aquifer, the thickness of the fine grained materials which separate the aquifers, the annual recharge, the connection between surface water and groundwater, the relationship between the model area and the surrounding areas (boundary conditions), and lastly, the location and pumping rate of wells. The Numeric method generates more accurate results than the CFR or Analytical methods. However, Numeric models are relatively costly to develop. Consequently, Numeric models are more commonly used by large utilities, with complex aquifers, which have the resources to collect the extensive model input data required.

A WHPA is defined as the surface and subsurface area surrounding a groundwater source through which contamination can potentially travel and reach the source. WHPAs are based on Zones of Contribution (ZOCs) that are derived from the estimated time of travel required for a contaminant to move from the point of introduction into the water bearing formation to the source. The DOH Wellhead Protection Program requires a WHPA to be subdivided into five zones, which include:

- A sanitary control zone of at least a 100-foot radius, unless engineering justification supports a smaller area (WAC 246-290-135). No source of contamination may be constructed, stored, disposed of, or applied within the sanitary control zone without the permission of DOH and the water purveyor.

- Four primary zones based on 6-month, 1-year, 5-year, and 10-year time of travel boundaries. These zones are referred to as the zones of contribution of the WHPA. Within this report, these zones will be abbreviated as $ZOC_{½}$ – 6-month zone of contribution, ZOC_1 – 1-year, ZOC_5 – 5-year, and ZOC_{10} – 10-year zone of contribution.

- One buffer zone (if necessary) extending from ZOC_{10} to a groundwater divide and highlighting areas where the aquifer may be particularly susceptible or vulnerable to contamination.

The ZOC_{10} defines the boundary of the WHPA and the area to be inventoried and managed to reduce the risk of contamination.

ANALYSIS

The CFR Method was used to analyze the wellhead protection area ZOCs for the City's well. This method is the minimum acceptable method of delineation for public water systems. The following equation is applicable:

$$r = \sqrt{\frac{Qt}{\pi nH}}$$

Where:

r	=	Radius of ZOCt
Q	=	Volume of water withdrawal (cubic feet per year)
t	=	travel time (1/2, 1, 5, and 10 years)
n	=	Porosity = 0.22 (default value)
H	=	well screen interval (ft) = 54 feet (from well log)

This equation was used to calculate zone of contribution radii for the 6-month (1/2 year), 1-year, 5-year, and 10-year time horizons for the City's well. The value to be used for Q, the groundwater withdrawal rate, reflects the maximum annual withdrawal anticipated for the well. The water right limitation is used as the maximum annual withdrawal anticipated for the well.

The pumping volume used in the CFR Method is the annual water right of 336 acre-feet per year, which equals 14,636,160 cubic-feet per year.

Radii values calculated for the various times of travel are presented in Table 5-1.

TABLE 5-1

City of North Bonneville Wellhead Protection Zones of Contribution (CFR Method)

Time of Travel	Dry Creek Well Zone of Contribution Radius (feet)[(1)]
6-month	440
1 year	625
5 years	1,400
10 years	1,980

(1) Radii are rounded to the nearest 5 feet.

Figure 5-1 shows the limits of the 6-month, 1-, 5-, and 10-year zones of contribution for the well.

N

0 1,600 3,200 Feet

WELL #1

OLD RESERVOIR

NEW RESERVOIR

BASS LAKE

BURLINGTON NORTHERN RR

2nd POWERHOUSE

CASCADE ISLAND

BONNEVILLE DAM AND SPILLWAY

1st POWERHOUSE

BRADFORD ISLAND

COLUMBIA RIVER

GREENLEAF CREEK

TULE LAKE

GREENLEAF LAKE

CASCADE DR.

EVERGREEN DR.

SR-14

HAMILTON CREEK

PIERCE WILDLIFE REFUGE

WASTEWATER TREATMENT FACILITY

LEGEND:

- 6 Month ZOC Radius = 442'
- 1 Year ZOC Radius = 626'
- 5 Year ZOC Radius = 1,400'
- 10 Year ZOC Radius = 1,980'
- City Limits
- Water Service Area
- Streams
- Reservoir
- Well
- Hydrant
- Water Lines

CITY OF NORTH BONNEVILLE

WATER SYSTEM PLAN
FIGURE 5-1
WELL NO. 1 ZONES OF CONTRIBUTION

Gray & Osborne, Inc.
CONSULTING ENGINEERS

ORTHO SOURCE: THE NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) 2009

M:\North Bonneville\11241 - WSP\GIS\FIG5-1 WELL_PROTECTION.mxd

CONTAMINANT SOURCE INVENTORY

An essential element of wellhead protection is an inventory of all potential sources of groundwater contamination in and around the delineated WHPA. The purpose of the inventory is to identify past, present, and proposed activities that may pose a threat to the well or surrounding area. For the inventory to be effective a full accounting of all known and potential sources of contamination within the zones must be conducted and the information accurately mapped. The inventory can also help to plan management strategies and establish a mailing list to notify businesses located within the WHPA as well as emergency response agencies.

POTENTIAL CONTAMINANT SOURCES

Within a WHPA, there are many diverse activities that may contaminate an aquifer thereby jeopardizing the water supply. It is important that these activities are properly inventoried and, if necessary, regulated to prevent degradation of the groundwater supply. Relevant activities include land use and zoning practices, landfill, commercial and industrial operations, underground storage tanks, clandestine drug lab sites, septic systems, dry wells and catch basins, as well as known sites of contamination. A discussion of these practices, their potential effects on groundwater and the regulatory requirements that may apply are included in the following sections.

Land Use and Zoning

A portion of the City of North Bonneville's WHPA is located within the City of North Bonneville service area and the remaining portion is located within unincorporated Skamania County. Areas within the service area are zoned residential, commercial and industrial and the area within Skamania County is zoned Rural Development District. Rural Development District is a mixed-use zoning district that allows a number of different land uses such as single-family residential, resource uses and limited commercial activity.

Landfills

A landfill is a disposal facility in which solid waste is permanently placed and is not a land treatment facility. Landfills are regulated by the Washington State Department of Ecology under WAC 173-304, Minimum Functional Standards for Solid Waste Handling. These regulations set siting and closure criteria, performance standards, and operating requirements for landfills. The regulations are highly restrictive in that a proposed landfill site must meet a series of "fatal flaw" tests. A wellhead protection area would qualify as a fatal flaw, thereby prohibiting the construction of a new landfill.

Past landfill practices were not so restrictive, however. Abandoned and improperly maintained landfills and dump sites are often a major source of groundwater

contamination. Leachate from landfills poses a threat to groundwater quality should it migrate to the water table. The Department of Ecology is responsible for mitigating dump site cleanup when potentially hazardous leachates are present.

There are no known active or closed landfills located within the City of North Bonneville's WHPA.

Commercial and Industrial Activity

Areas of commercial and industrial land use are located within most wellhead protection boundaries. Businesses that may contribute contaminants to the groundwater include dry cleaners, gas stations and other businesses with fuel storage tanks, auto repair shops, metal plating facilities, asphalt and concrete facilities, and machine shops. Wastes generated at these businesses include substances such as petroleum products, solvents, surfactants, heavy metals, and other organic materials. These wastes can potentially enter the groundwater system through inadequate disposal practices or accidental spills. Table 5-2 presents typical commercial and industrial activities and the potentially hazardous chemicals that may be associated with them.

Bonneville Power's main transfer substation is located within the City's 10 year ZOC.

TABLE 5-2

Chemicals Associated with Commercial and Industrial Activities

Commercial/Industrial Activity	Potential Contaminants
Automobile/Truck Service	waste oils, solvents, acids, paints, soaps
Boat Yard/Marinas	detergents, gasoline, diesel fuels, batteries, oil, seepage from boat waste disposal areas, wood preservative and treatment chemicals, paints, waxes, varnishes, automotive wastes
Dry Cleaners	solvents (perchloroethelyene, petroleum solvents, Freon) spotting chemicals, (trichloroethane, methylchloroform, ammonia, peroxides, hydrochloric acid, rust removers, amyl acetate)
Cemeteries	fertilizers, pesticides
Country Clubs/Golf Courses	fertilizers, herbicides, pesticides, swimming pool chemicals, automotive wastes
Electric/Electronic Equipment Manufacturers	nitric, hydrochloric and sulfuric acid, heavy metal sludges, ammonium persulfate, cutting oil and degreasing solvent, corrosive soldering flux, waste plating solution, cyanide, methylene chloride, perchloroethylene, trichloroethane, acetone methanol

TABLE 5-2 – (continued)

Chemicals Associated with Commercial and Industrial Activities

Commercial/Industrial Activity	Potential Contaminants
Furniture/Wood Manufacturing	paints, solvents, degreasing and solvent recovery sludge
Metal Plating Shops	sodium and hydrogen cyanide, metallic salts, alkaline solutions, acids, solvents, heavy metal contaminated wastewater/sludge
Lawns and Gardens	fertilizers, herbicides, pesticides
Printers, Publishers	solvents, inks, dyes, oils, miscellaneous organics, photographic chemicals
Sand and Gravel Mining	diesel fuel, motor oil, hydraulic fluids
Scrap, Salvage and Junkyards	used oil, gasoline, antifreeze, PCB contaminated oils, lead acid batteries

Underground Storage Tanks

Underground storage tanks (USTs) and leaking underground storage tanks (LUSTs) are a major threat to groundwater quality. Petroleum products which may contain impurities that are mobile in the groundwater system are the most commonly stored substances in USTs. The EPA estimates that 35 percent of all USTs could be leaking. The most common causes of leaks are structural failure, corrosion, improper fittings, and improper installation. Ecology regulates underground storage tanks in Washington State under WAC 173-360, Underground Storage Tank Regulations. The regulations require that owners and operators of underground storage tanks comply with the following sections of the regulations:

- Notification, reporting, and record keeping.
- Performance standards and operating closure requirements.
- Registration and licensing.
- Financial responsibility.

The WAC allows a number of exemptions including tanks whose capacity is 110 gallons or less, farm and residential tanks with less than 1,100 gallons, heating oil less than 1,100 gallons per premises, and septic tanks.

As of July 1, 1991, owners and operators of all existing nonexempt underground tanks must have a permit from Ecology. A valid permit is a requirement for delivery of regulated substances. The permit must be updated annually. As a condition of the permit, the owner must have completed the following requirements:

- An assessment of the tank condition by an Ecology licensed tank service provider.
- Replacement of leaking tanks and site cleanup.
- Installation of leak detection devices.
- Proof of insurance to compensate a third party in the event of bodily injury or property damage resulting from a leaking tank. One million dollars insurance is required for petroleum marketing facilities.

By 1998, all existing nonexempt underground storage tanks must have provided cathodic protection and spill and overflow containment, in addition to the above requirements.

Installation and replacement of underground storage tanks must meet the specifications and performance and design standards identified in the WAC. Ecology follows the federal UST guidelines, which at this time do not require double wall vessels.

Underground storage tank inspections are performed by Ecology primarily through the information developed in the permitting process. Although routine annual inspections are not performed, Ecology inspectors do prioritize sites considered potentially hazardous. Technical assistance visits are also conducted at the request of the owner/operator. This provides another avenue in which Ecology can monitor the status of USTs.
Ecology maintains a file on all permitted USTs in Washington State, as required by RCRA, Subtitle 1. The file provides the site name and address, tank identification number, date of installation, size, tank status, and the substance stored at the site.

There are three known operational USTs within the City of North Bonneville. The North Bonneville Food Mart and Gas Station has three USTs, but these are outside of the City's WHPA.

Clandestine Drug Labs

Clandestine drug labs have been becoming an increasing problem in many parts of the country. Labs that produce illicit drugs use a wide variety of solvents and toxic, caustic and acidic substances. Because their activities are strictly illegal, they rarely dispose of wastes in an environmentally friendly manner. Therefore, these sites are potentially sources of groundwater contamination.

DOH maintains a list of known sites in Washington contaminated by clandestine drug labs. No sites within the City of North Bonneville area are included on the DOH list. Unfortunately there is no way to know the location of sites that have not been discovered and closed.

Septic Systems

Contaminants associated with septic tank effluent include pathogenic organisms, toxic substances, and nitrogen compounds. Ammonia and nitrate nitrogen are highly soluble in water.

The City of North Bonneville is served by a sewer system, while outside of the City boundary individuals rely on septic tanks. County parcel records do not always indicate the sewage disposal method. However, it is assumed that all residences within the WHPA are connected to the City of North Bonneville sewer system and routed to the City's Wastewater Treatment Facility (WWTF) for treatment and ultimate disposal in the Columbia River. The City of North Bonneville WWTF is located outside of its WHPA.

Drywells, Catch Basins, and Improperly Sealed or Secured Wells

Stormwater serves as a source of groundwater recharge, but it can also be a source of groundwater contamination. Runoff from streets, parking lots and other impervious surfaces can contain heavy metals, hydrocarbons, petroleum products, pesticides, and animal wastes. Dry wells may be used for stormwater, septic waste, or other wastewater disposal at commercial, industrial, and multi-family residential sites. Dry wells and catch basins may be located along major transportation corridors. Contaminants generated along transportation routes, such as highways and railroad corridors, include petroleum products, lead, hazardous chemicals and other emission products. Dry wells and catch basins are potential sites of contamination because their intended use often discharges contaminants directly into the groundwater.

Accidental Spills

Accidental spills or releases of contaminants can potentially impact groundwater supplies. Potential sources of spills and leaks include underground storage tanks, accidental spills on the railroad or Highway 14 and poor disposal practices. The City of North Bonneville well is located in secure, residential area, with few potential sources of contamination nearby. For these reasons, it is unlikely there will be a hazardous spill that would affect the City's wells. The City should contact the agencies listed above for assistance if there is a spill, with the Department of Ecology's 24 Hour Spill Response being the first contact.

A notification letter should be sent out to the local emergency responders discussing the wellhead protection plan and the need for precautions during spill response in within the wellhead protection areas. A copy of Figure 5-1 which shows the well locations and the time of travel boundaries should be included with these letters. A sample notification letter has been included as Appendix G.

Confirmed and Suspected Contamination Sites

Under WAC 173-340, Model Toxics Control Act — Cleanup, 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 Ecology. Ecology conducts an initial site investigation within 90 days of learning of a potentially contaminated site. If this investigation shows that remediation action is required, the site will appear on the Confirmed and Suspected Contaminated Sites Report. The sites are also given a Washington Ranking Mode BIN number between 1 and 5. A ranking of 1 indicates the greatest assessed risk to human health and the environment. The contaminant type and the affected media, such as groundwater, are also noted. Once the remedial action has been completed, Ecology's Toxics Cleanup Program determines if the site can be removed from the list.

The siting and operation of facilities that use, treat, store, or dispose of hazardous waste are subject to the requirements of the Resource Conservation and Recovery Act (RCRA), Subtitle C. In Washington State, the Department of Ecology regulates facilities that generate more than 220 pounds of hazardous waste per month under WAC 173-303, Dangerous Waste Regulations. The regulations are significant in that they establish a number of requirements for these facilities including surveillance and monitoring, record keeping, performance and design criteria, and siting and closure procedures. Ecology divides the facilities into three levels of hazardous waste accumulation: Level 1 facilities generate 2,200 pounds of waste per month or more; level 2 facilities generate between 220 and 2,200 pounds per month; and level 3 facilities generate less then 220 pounds. Level 3 generators are exempt from the regulations. All level 1 and 2 facilities must initially file a report of their activities with Ecology and update those activities annually. From these reports, an identifier code is established for each facility. This code is required by a transporter to deliver or accept shipments. A summary of those activities are published annually by Ecology, thereby allowing water purveyors the opportunity to determine the types of activities present within their WHPA.

There are several sites in the Skamania County area listed in the Department of Ecology Toxics Cleanup Program Confirmed and Suspected Contaminated Sites List. All of these sites are located outside of the City's WHPA. The nearest is an AT&T Radio Relay site at Beacon Rock that has been cleaned up.

SUMMARY OF POTENTIAL CONTAMINANT SOURCES

Table 5-3 summarizes the potential sources of contamination found within the 6-month, 1-, 5- and 10-year zones of contribution for the City of North Bonneville wells.

TABLE 5-3

Potential Contaminant Sources within the City of North Bonneville Wellhead Protection Area

Potential Source	6-Month ZOC	1-Year ZOC	5-Year ZOC	10-Year ZOC
USTs	None Known	None Known	None Known	None Known
LUSTs	None Known	None Known	None Known	None Known
Hazardous Waste Generators	None Known	None Known	None Known	Bonneville Power Transfer Station
Known Sites Contaminated by Clandestine Drug Labs	None Known	None Known	None Known	None Known
State Cleanup Sites	None Known	None Known	None Known	None Known
Solid Waste Transfer Station	None Within City of North Bonneville			
Sewage Treatment Facility	None	None	None	None
Accidental Spills	SR 14 and Burlington Northern Railroad	None	None	None

INVENTORY DATA SOURCES

The inventory of potential contaminant sources was compiled using various data sources. Agencies such as Ecology and EPA maintain contaminant databases that list businesses that handle and store potential contaminants. The following databases were used to create the inventory for the City's WHPAs:

- **Underground Storage Tank Report, (February 2012)**
  The most recent version of the Underground Storage Tanks (UST) Report was obtained from Ecology's Toxics Cleanup Program. This list was used to locate the facilities that contain underground storage tanks and verify facilities located by field surveys of the wellhead protection areas. These facilities are summarized in the inventories and located on the maps.

- **Leaking Underground Storage Tank Report, (February 2012)**
  The most recent Leaking Underground Storage Tank (LUST) Report was also obtained from Ecology's Toxics Cleanup Program. This report was used to locate the leaking underground storage tanks on the wellhead protection area maps and note the status of remedial action at the site. The LUST report lists the site name, address, age, volume, and status of sites that contain leaking underground storage tanks.

- **Dangerous Waste and Materials Generators**
  This program, the EPA's RCRA program, has been taken over by Ecology within the State of Washington and is regulated under the Dangerous Waste Regulations (173-303 WAC).

- **Confirmed and Suspected Contaminated Sites Report, (February 2012)**
  Ecology maintains the Confirmed and Suspected Contamination Sites Report. The list is updated continuously as new information becomes available. Each site is given a site status code indicating the status of the cleanup process.

- **Clandestine Drug Lab List, (February 2012)**
  The Department of Health maintains a list of sites contaminated by clandestine drug labs. A current list of sites contaminated by drug labs was obtained from the DOH web site.

- **Zoning and Land Use**
  Zoning designations were obtained from the City.

Field surveys were conducted to verify, where practical, the potential contaminant sources indicated in the databases.

NOTIFICATION OF FINDINGS

The City of North Bonneville will notify State and local agencies of the wellhead protection program's findings, including the WHPA boundaries. The City will also notify residents and customers within the contribution radii with a letter discussing risks to the water system and actions to be taken in case of a spill or accidental contaminant application. Any residents with on-site sewage disposal systems will also be sent notification of precautions they can take to minimize impacts from on-site sewage disposal systems.

SPILL RESPONSE PLANNING

Spill response planning is an important aspect of both an emergency management plan and a wellhead protection program. The release of hazardous materials in a wellhead protection area can create further problems than the initial contamination of soil and surface water. When the release occurs in either the 1-, 5- or 10-year zones of travel, there is the possibility of the spill eventually contaminating the aquifers that supply the City's drinking water. Planning for spill response should reflect the needs and concerns of the City while maintaining the quality of the groundwater.

Specific response procedures for wellhead protection areas must be determined prior to the occurrence of a contamination incident. The information obtained as a result of the susceptibility assessment and the wellhead protection area inventory can be used to determine what types of spill response measures are necessary for the protection of drinking water sources. In order to be accepted by local emergency responders, spill response procedures for wellhead protection areas should be realistic and easily implemented.

In order for spill response procedures to be effectively executed, coordination, cooperation, and communication among the responding agencies, organizations, and individuals is imperative. There are many spill response organizations at the local, state, and federal levels. Depending on the magnitude and type of the release, any of the following organizations may be involved in a spill response for a wellhead protection area in Washington State.

- *Department of Ecology (DOE):* The Spill Response Team is responsible for determining the source and cause of the release, and responsible party. If the responsible party is unknown, DOE will investigate to determine who is responsible and ensure that containment, cleanup, and disposal proceedings begin. The DOE's 24 Hour Spill Response can be contacted at (360) 753-2353.

- *Department of Health (DOH):* The Department of Health is developing a set of standard operating procedures, in conjunction with organizations such as DOE's Spill Operations Section and the Association of Fire Chiefs, which first responders can use in wellhead protection areas, critical aquifer recharge areas, and other sensitive groundwater areas. DOH also provides assistance through laboratory support and services if necessary to the cleanup effort.

- *Department of Transportation (DOT):* The Washington State DOT can provide spill response assistance through traffic control, equipment, and personnel for non-hazardous cleanup activities on state and interstate highways.

- *State Patrol:* The state patrol is responsible for managing spills on interstate and state highways.

- *Local Fire Department:* Initial response to a hazardous spill will most likely be from the City of North Bonneville Fire Department. The Skamania County Fire District No. 5 should be notified of the wellhead protection area boundaries.

There are many spill response plans in existence in Washington State which address specific geographical areas such as wellhead protection areas and types of materials such

as oil discharges. Organizations involved in the storage and transport of hazardous substances have also been required to develop spill response plans. These plans are designed to be consistent and compatible to ensure that response efforts can be carried out effectively.

CONTINGENCY PLANNING

Contingency planning is an important component of a wellhead protection program. In the event that the City's well needs to be taken offline due to contamination, a contingency plan helps to provide mitigation. A properly prepared and updated contingency plan helps ensure the water system and local officials are prepared to respond to emergency situations. Contingency planning also includes provisions for alternate sources of drinking water. The following steps are necessary for the development of an effective contingency plan:

- Identify maximum capacities of the existing system as to source, distribution system, and water rights restrictions. Assume a loss of well and reevaluate.
- Evaluate the expansion options of the existing system's capacities relative to existing water rights.
- Identify existing or potential interties with other public water systems.
- Evaluate current procedures and make recommendations on contingency plans for emergency events.

INTERTIES

The City of North Bonneville has no existing interties. The Army Corps of Engineers is the nearest water supply to the City and may be able to provide significant source capacity to the City in the event of an emergency via a temporary above ground pipeline.

RECOMMENDATIONS

In addition, the following items are recommended contingency planning efforts the City of North Bonneville should consider implementing:

- Develop emergency procedures for implementing water conservation measures should the well become contaminated.
- Diversify future source locations. Ideally new sources could be located in areas with limited potential contaminant sources and in areas far from existing sources. This would minimize the chance of all of the sources being contaminated at one time.

- Investigate the possibility of obtaining data from nearby monitoring wells in order to track potential contaminants in the aquifer near the wells.

- Make general information available for the public at the City Center regarding the location of wellhead protection areas and appropriate handling of wastes.

- Provide public education materials regarding appropriate handling and disposal of potential groundwater contaminants.

CHAPTER 6

OPERATIONS AND MAINTENANCE PROGRAM

OBJECTIVE

The objective of this chapter is to present the City of North Bonneville's Operation and Maintenance (O&M) program to assure satisfactory management of the water system operations in accordance with WAC 246-290.

The O&M Program includes the following elements:

- Water System Management and Personnel.
- Operator Certification.
- System Operation and Control.
- Preventive Maintenance Program.
- Emergency Response Program.
- Cross-Connection Control Program.
- Record Keeping and Reporting.
- O&M Improvements.

WATER SYSTEM MANAGEMENT AND PERSONNEL

The water system is maintained by the City of North Bonneville.

OPERATOR CERTIFICATION

Department of Health (DOH) requires all Group A water systems to have at least one certified Water Distribution Manager (WDM) under WAC 246-292-050. The WDM must further be certified at a level equal to or higher than the water system's classification rating as described in Table 6-1 and in accordance with WAC 246-292-040.

TABLE 6-1

Water System Group Classification

Classification	Population Served
Group 1	Less than 1,500
Group 2	1,501 to 15,000
Group 3	15,001 to 50,000
Group 4	Greater than 50,000

The North Bonneville Water Department serves less than 1,500 people so it is required to have a WDM with Level 1 certification. Additionally, they are required to develop a Cross-Connection Control (CCC) Program and must ensure that a Cross-Connection Specialist (CCS) is employed on staff to ensure correct development of the program and proper protection to the potable water supply. A Backflow Assembly Tester (BAT) is responsible for the annual inspection and testing of backflow prevention assemblies in accordance with WAC 246-290-490. The City currently contracts out backflow assembly testing. Table 6-2 provides a list of the maintenance personnel, positions, and certifications.

TABLE 6-2

Operations and Maintenance Personnel City of North Bonneville(1)

Staff	Position	Certification
Bryan Henrichsen	Assistant Utilities Manager	WDM 1 CCC pending
Russell Watts	Utilities Operator (temporary)	WDM3

(1) The City is currently in the hiring process for a full-time utilities operator.

PROFESSIONAL GROWTH REQUIREMENTS

In order to promote and maintain expertise for the various grades of operator certification, Washington State requires that all certified operators complete not less than three Continuing Education Units (CEU) within each 3-year period. Programs sponsored by both Washington Environmental Training Resources Center (WETRC) and the American Waterworks Association (AWWA) Pacific Northwest Subsection are the most popular source of CEUs for certified operators in Washington State. A professional growth requirement may also be met by advancement by examination or certification in a different classification.

In addition to providing CEUs, operator training is an important component in maintaining a safe and reliable water system. At a minimum, all personnel performing water system related duties should be trained in the following areas.

- Confined space.
- Trenching and shoring.
- Traffic Flagging.
- Asbestos cement pipe safety.
- Cross Connection Control.
- Chemical Handling.
- First Aid and CPR.
- Self Contained Breathing Apparatus use.

It is the responsibility of the City of North Bonneville to assure that the Public Works staff receives the training required to remain certified.

SYSTEM OPERATION AND CONTROL

The City's staff is responsible for the daily operation of its well, storage facilities and distribution system. In addition to daily operation they also perform preventative maintenance on the system.

IDENTIFICATION OF MAJOR SYSTEM COMPONENTS

It is important for water utilities to have in place a program that ensures the proper operation of the water system and the continuous reliability of critical system components. This section details the City of North Bonneville's ability to operate, monitor and control its various water system facilities. These facilities include wellheads, reservoirs, disinfection systems, distribution systems, valves and master meters. The related operational activities performed by operations staff are identified, and the schedule under which these tasks are performed is presented. The normal operation of the water system was described in Chapter 1 and the locations of major water system components are shown in detail in Figure 1-2.

PREVENTIVE MAINTENANCE

The most cost effective method for maintaining a water system is to provide a planned preventative maintenance program. Through a planned preventive maintenance program, the optimal level of maintenance activities can be provided for the least total maintenance cost. Preventative maintenance programs involve defining the task to be performed, determining the frequency for each task, and then providing necessary staff to perform the task. A summary of the preventative maintenance performed at the North Bonneville Water Department is provided in Table 6-3. Examples of maintenance records for these facilities are provided in Appendix H.

Sources of Supply

The City supplies all of its water from a single well source. Water from this well is pumped to storage and the distribution system. The City's source is currently equipped with diesel backup power capability.

TABLE 6-3

Summary of Preventative Maintenance Activities

Facility	Type of Maintenance	Maintenance Schedule
Hydrants	• Flush • Exercise • Measure flow	Annually (By Fire Department) and Public Works staff
	• Paint	Every 5-years
Treatment	• Monitor Sodium Hypochlorite Level	Daily
	• Replace Sodium Hypochlorite Solution	As Needed
	• Cleaning of the lines	Weekly
	• Diaphragm replacement on pump	As Needed
Distribution System	• Monitor Residual Concentration	Daily
	• Calibrate source meters	Every 3-years
	• Water samples	See Chapter 3
	• Identify and repair leaking water mains	As Needed
	• Flush water lines	Once per year
Backflow Devices	• Inspect and test backflow prevention devices	Annually
Production Wells	• Read source meter	Daily
Reservoirs	• Empty for turnover	Every other year
Clearwell	• Clean	As Needed

Treatment

Treatment with sodium hypochlorite and sodium silicate occurs at the well house. The disinfectant is supplied from a chemical feed pump at a dosage rate of 0.230 gallons per hour. The system was installed in September 2012 by Whitney Equipment Company. The chemical feed pump manufacturer is Grund Foss. The chlorine system is used only to provide a disinfection residual in the distribution system and is not equipped to provide a contact time.

Daily operations at the chlorination system include recording the chlorine dosage, weather conditions, time and the chlorine residual results. The chlorine residual is maintained within a range of 0.2 to 0.3 mg/L.

Storage

Reservoirs can be vulnerable to contamination in public water systems. Contaminants can enter the reservoir through cracks or openings at the vent, overflow or drain screens. Deteriorating hatch covers and vandalism can also compromise reservoir water quality. Poorly designed and maintained reservoirs can hamper the emergency operation of a water system. If reservoir drains are not functioning properly, it may be difficult to purge a contaminant from the system. Written documentation of reservoir maintenance must be completed with each inspection and repair, and a copy of the report retained on file.

Steel reservoirs need to be painted every 20 to 25 years. The Old Reservoir was constructed in 1970 and refurbished in 2002. The interior and exterior of the Old Reservoir were repainted in 2003 and the structure was seismically retrofitted. Much of the Old Reservoir appears to be in good condition. The New Reservoir was constructed in 2002 with a factory finish on the interior and exterior that remains in excellent condition.

Distribution System

Maintaining records of water main conditions and repair work can play a significant role in preventing water main breaks and emergency shutdowns. By documenting leaks and maintenance work on each pipe section, trends and patterns can be established, and severe problems can often be averted. Currently the City does keep written records of reported leaks, breaks, main repairs, or water quality complaints.

Dead-end waterlines are susceptible to water quality problems and should be flushed to remove stagnant water and any sediment that may have been deposited. The City currently flushes dead end water mains as needed.

Valves are necessary for water system control during emergencies, scheduled repairs and maintenance, and water main extensions. Quite often, contractors and other maintenance personnel who operate distribution system valves during construction activities may inadvertently leave valves closed or partially open at the conclusion of their project. A routine valve exercise program, performed at least yearly, will ensure that normally open valves are fully open, thus providing full flow in the event of a fire or other large system demand. Exercising valves also aids in finding damaged or broken valves that could fail when they are operated for shutdowns. It is the responsibility of the City to know the location, type, and size of all valves within the system.

Fire hydrants are equally important water system components, and, like valves, require routine inspection and maintenance. Both valve and hydrant maintenance is sometimes overlooked, most often as a result of constraints on available staff. Currently, the City does inspect and flush its hydrants. This is done annually by the Fire Department and Public Works staff. It is recommended that this is done twice a year, usually in the early winter before it freezes, and consideration should be given to providing a similar type of

maintenance program for the valves in the system. Although the distribution system is relatively small, records should also be kept documenting valve and hydrant inspection and any work that has been done on them.

Meters

Accurate and well-maintained water meters are an essential tool in the efficient management of a water utility. In addition to their economic importance, water meters provide the utility a means to estimate lost and unaccounted water, measure the success of conservation programs, and determine compliance with water rights.

Existing Meter Reading System

The City's distribution system is fully metered. The source meter at the City's well is read daily. All meters are read every other month.

Manual Reading System

Manual meter reading involves visual reading of meters and utilizing meter read books in which the meter reader manually enters meter reads. The books are then delivered to the billing department where the meter reads are manually entered into a computerized billing program. The billing program notes any usage that is out of the ordinary and prompts meter re-reads, which means the reader goes back to the meter to verify the usage. This system is very labor intensive and prone to errors in reading, recording, and transcribing water use data.

INVENTORY OF MATERIALS

The City of North Bonneville maintains supplies required to make emergency repairs to their water system and to install new services. At a minimum, the supplies include the supplies necessary to repair leaks for every size and type of pipe in the distribution system. This includes PVC and DI piping, dresser couplings and valves for pipe sizes ranging from 3/4 inch to 14 inch.

EMERGENCY RESPONSE PROGRAM

Water utilities have the responsibility to provide an adequate quantity and quality of water in a reliable manner at all times. To do this, utilities must reduce or eliminate the effects of natural disasters, accidents and intentional acts. Most utilities routinely deal with small scale emergency situations. Large scale emergency situations occur far less frequently, but may manifest themselves in the same way as the routine emergencies. If a utility is well prepared to handle routine emergencies, then they will also be better prepared to handle more disastrous ones as well.

VULNERABILITY ANALYSIS AND EMERGENCY PROCEDURES

Although it is not possible to anticipate all potential disasters affecting the City's water system, formulating procedures to manage and remedy several common emergencies is appropriate. Common types of emergency situations include contamination of the water supply, power failure, a severe earthquake, and fire.

Contamination of the Water Supply

The most common problem for small water system is the detection of coliform bacteria. In many instances, bacteria contamination can be quickly resolved by chlorine disinfection. Instructions that the City should follow in the event that coliform bacteria are detected in the system are listed below in Table 6-4.

If contamination of the water supply does occur, there are procedures that must be followed in order to comply with Department of Health requirements. Procedures for various types of contamination are discussed in the following sections.

Bacteriological Presence Detection Procedure

Notification procedures for notifying system customers, the local health department, and DOH of water quality emergencies are an important component of an emergency response program. All public water systems will occasionally experience detection of bacteriological contaminants. Such detections are typically the result of sample tap contamination or improper bacteriological sample collection procedures. However, the persistent detection of coliform bacteria in the water supply, particularly E. Coli or fecal coliform, may require the issuance of a public boil water notice to ensure that the health and safety of water customers is not compromised. Emergencies such as floods, earthquakes, and other disasters can result in damage to the water system infrastructure, which may also warrant a boil water notice as a precautionary measure. A suggested boil water notice is provided in Appendix I. WAC 246-290-320 requires water utilities to follow specific procedures in the event coliform bacteria are detected in the water system. These procedures are outlined in Figure 6-1.

TABLE 6-4

Bacteriological Contamination Response Procedures

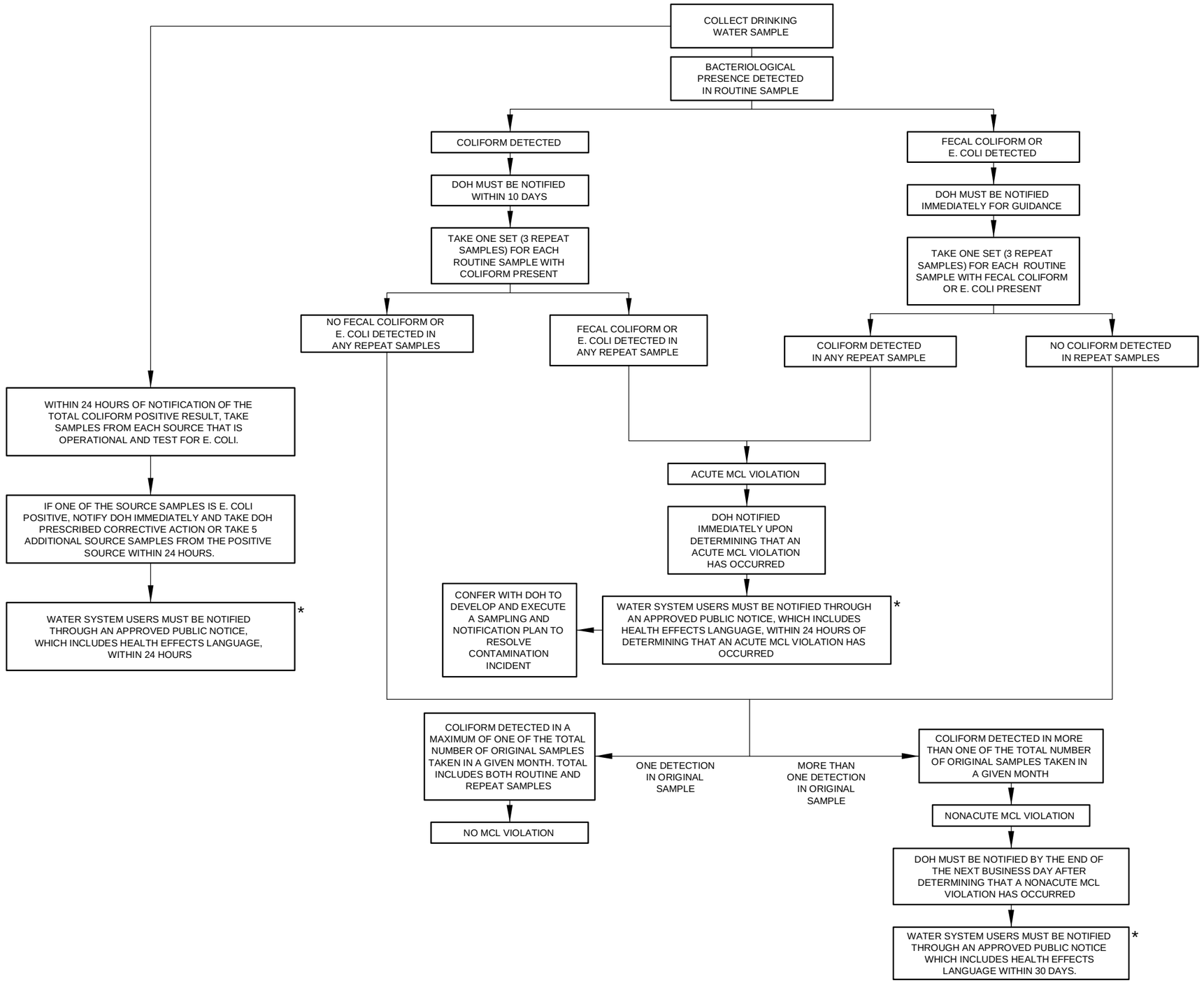
Contamination Site	Response Procedures
Reservoir	1. Collect repeat sample to confirm contamination. 2. Close valves to isolate reservoir from system and redirect wells to supply distribution system directly. 3. Inspect vents, screens, hatches, and piping to identify contamination source. 4. Drain, clean, and disinfect reservoir if water is unsuitable for consumption due to stagnation or contamination. 5. Disinfect reservoir with chlorine as required in AWWA Standards. Collect repeat samples and return reservoir to service when results are satisfactory.
Distribution System	1. Close valves where possible to isolate contamination source. 2. Flush lines to end of distribution system until chlorine residual is detected. 3. Allow 24 hours or chlorine contact time in distribution system. 4. Collect repeat samples and return system to service when results are satisfactory.

IOC, VOC, and SOC Detection Procedures

A procedure for an inorganic chemical detection is presented in Figure 6-2. A procedure to comply with DOH requirements in the event of a volatile organic chemical or synthetic organic chemical detection is presented in Figure 6-3. There is little that the City can do on a short-term basis to resolve a Volatile Organic Compound (VOC) or Synthetic Organic Compound (SOC) contamination event. Therefore Figure 6-3 presents a strategy for managing such a contamination event.

Power Failure

Various types of weather can cause loss of power, such as wind storms, lightning, and snow storms. Table 6-5 lists the facilities which may be affected by a lengthy power outage and actions that may be taken to reduce the impact on the water system.



* METHOD OF PUBLIC NOTIFICATION SHALL USE ONE OR MORE OF THE FOLLOWING:

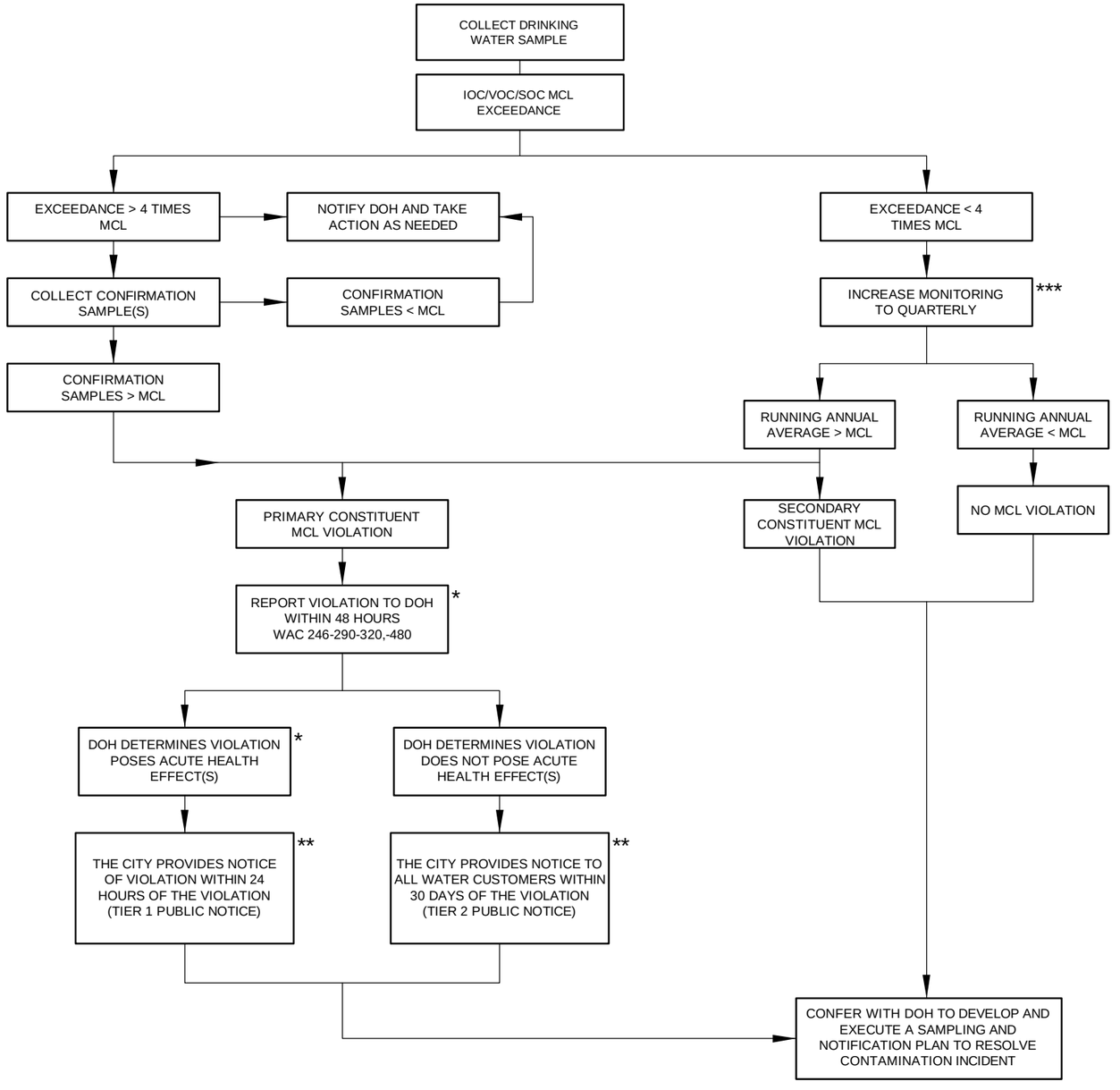
1. BROADCAST MEDIA (SUCH AS RADIO OR TV) BASED ON DOH GUIDANCE.
2. POST IN CONSPICUOUS LOCATIONS THROUGHOUT THE WATER SERVICE AREA
3. HAND DELIVERY TO WATER CUSTOMERS
4. OTHER METHODS APPROVED BY DOH.

CITY OF NORTH BONNEVILLE

FIGURE 6–1
BACTERIOLOGICAL PRESENCE DETECTION PROCEDURE

Gray & Osborne, Inc.
CONSULTING ENGINEERS

DOH: Washington State Department of Health



DOH: Washington State Department of Health
WAC: Washington Administration Code

* A VIOLATION OF THE 10.0 mg/L NITRATE MCL CONSTITUTES AN ACUTE HEALTH EFFECT CONCERN. DOH MUST BE NOTIFIED IMMEDIATELY UPON VIOLATION OF THE NITRATE MCL.

** METHOD OF PUBLIC NOTIFICATION SHALL USE ONE OR MORE OF THE FOLLOWING:

1. BROADCAST MEDIA (SUCH AS RADIO OR TV) BASED ON DOH GUIDANCE.
2. POST IN CONSPICUOUS LOCATIONS THROUGHOUT THE WATER SERVICE AREA
3. HAND DELIVERY TO WATER CUSTOMERS
4. OTHER METHODS APPROVED BY DOH

*** THE CITY TESTS QUARTERLY DURING REGULAR OPERATION.

CITY OF NORTH BONNEVILLE

FIGURE 6-2
INORGANIC CHEMICAL/VOC/SYNTHETIC ORGANIC CHEMICAL DETECTION PROCEDURE

Gray & Osborne, Inc.
CONSULTING ENGINEERS

TABLE 6-5

Power Outage Response Procedures

Facility Affected	Response Procedures
Well	1. Contact Skamania County PUD to determine the length of the power outage.
Reservoir	1. Check the reservoir level. 2. Notify customers to curtail water use if reservoir level continues to drop.
Distribution System	1. Continue to monitor reservoir 2. Request additional water use curtailment.
Chlorination Facility	1. Run booster pump using generator.

Severe Earthquake

Although severe earthquakes are rare, the City of North Bonneville may be vulnerable if facilities are damaged. Table 6-6 lists facilities that may be affected by a severe earthquake and the actions that may be taken to reduce the impact on the water system.

TABLE 6-6

Earthquake Response Procedures

Facility Affected	Response Procedures
Well	1. Check well and shut down pumps if necessary.
Reservoirs	1. Check reservoirs for structural damage. 2. Drain reservoirs if there is a danger of bursting, or seal cracks and leaks as required.
Distribution System	1. Isolate damaged sections and repair.

Fire

A large fire in the City will most likely result in a reduction in distribution system pressures and drawing down of the reservoirs. The well should be checked to ensure it is operating properly to provide additional water. The water level in the reservoirs should also be checked to see how much storage is available for system demands and firefighting.

EMERGENCY CONTACT INFORMATION

Appendix J provides a list of Emergency Contacts for the City's water utility that include regulatory officials, equipment and material vendors and contractors.

MITIGATION RECOMMENDATIONS

Water system reliability is an important responsibility of a water purveyor. WAC 246-290-400, Reliability, requires that water purveyors ensure adequate water service in the event of failure of a key system component.

The City of North Bonneville, like any other water system, is vulnerable to a number of situations which may disrupt service, as described in the previous section. Depending on the emergency, disruption to water service could last a few hours, or several days, as would be the case in a long term power outage.

CROSS-CONNECTION CONTROL PROGRAM

As required by WAC 246-290-490, Cross-Connection Control, utilities have the responsibility to protect customers from water contamination due to cross connections. A cross-connection control program is required to be included in the Water System Comprehensive Plan under WAC 246-290-100.

A cross-connection is any physical arrangement where the potable water supply is connected, directly or indirectly, to any liquid of unknown or unsafe quality that may contaminate the public water supply through backflow. The regulation also requires utilities to develop and implement a comprehensive program to control cross-connections within the system. An acceptable cross connection control program must address the following elements:

- Establishment of legal authority and program policies;
- Evaluation of premises for cross-connection hazards;
- Elimination and/or control of cross connections;
- Provision of qualified personnel;
- Inspection and testing of backflow prevention assemblies;
- Quality control of testing process;
- Response to backflow incidents;
- Public education for consumers;
- Record keeping for CCC program.

In addition, other CCC program requirements are:

- Coordination with the Local Administrative Authority (LAA), which is the county building or plumbing official regarding CCC activities;
- Prohibition of the return of used water into the public water system (PWS) distribution system; and
- Inclusion of a written CCC program into the North Bonneville Water System Plan (WSP).

The adopted Cross-Connection Control Program and Resolution for the City of North Bonneville is based on WAC 246-290-490. North Bonneville Municipal Code 13.04.230, Cross-Connection Prevention defines the cross connection program. A copy of the Cross-Connection Control Program and Resolution is included in Appendix K.

The City does not currently have a CCS on staff. The City contracts with Mr. Karl Wilkie of the Port of Skamania County ((509) 427-5484) for hazard assessments and testing. His cell phone is (509) 378-0928.

NEW AND EXISTING CROSS CONNECTION DEVICES

The City allows only DOH approved backflow prevention assemblies.

RECORD KEEPING AND REPORTING

Records of the various operational and maintenance parameters of the system are maintained by the City.

COLIFORM MONITORING PLAN

As required by the DOH the city has a regular coliform monitoring plan in place to check for bacterial contamination of the distribution system. Samples are taken monthly at one of four locations. The locations rotate throughout the year. A map of coliform sampling locations is provided in Appendix L.

CHAPTER 7

CAPITAL IMPROVEMENT PROGRAM

INTRODUCTION

This chapter presents the Capital Improvement Plan (CIP) for the 6- and 20-year planning periods. Recommended water system improvements and associated costs, along with scheduling information is presented in the following sections according to analyses, identified deficiencies, and recommendations identified in earlier chapters of this Plan. For the proposed projects identified in this chapter, preliminary cost estimates are provided in Appendix M. The costs associated with these projects include construction, administrative and engineering costs (25 percent), and a contingency factor (20 percent). The project costs are in 2012 dollars. The ENR Construction Cost Index at the time these estimates were prepared was 9267.57.

In the future, other projects may arise which are not identified as part of the City's CIP. Such projects may be deemed necessary for ensuring water quality, preserving emergency water supply, accommodating transportation improvements proposed by other agencies, or addressing unforeseen problems with the water system. Due to budgetary constraints, the completion of these projects may require that the proposed completion dates for projects in the CIP be rescheduled. The City of North Bonneville retains the flexibility to reschedule projects, as best determined by the City when new information becomes available for evaluation. Each capital improvement project should also be reevaluated to consider the most recent planning efforts, as the proposed completion date for the project approaches.

CAPITAL IMPROVEMENT PLAN

Table 7-1 summarizes the proposed capital improvement projects for the 6-year and 20-year planning period. All costs discussed in this Chapter are in 2012 dollars. Detailed cost estimates for the capital improvement projects are included in Appendix M. Rate impacts associated with capital project financing are discussed in Chapter 8.

STORAGE

ST-1: Repaint Old Reservoir – Welded Steel

Estimated Project Cost: $215,000

The old welded steel reservoir was constructed in 1976 and has never been repainted. Reservoirs of this type should be repainted every 20 years. The cost includes sandblasting, prepping and painting both the interior and exterior of the Old Reservoir. Repainting the Old Reservoir is scheduled in the 20-year planning period.

TREATMENT PLANT

TR-1: Sodium Hypochlorite Disinfection System

Estimated Project Cost: $15,000

The continued use of chlorine gas as a disinfectant will involve significant regulatory requirements due to health and safety risks associated with gaseous chlorine. The City will replace this system with a bulk liquid sodium hypochlorite system. The system will include a chemical metering pump, 55-gallon drum to hold the sodium hypochlorite liquid, and additional ventilation in the existing chlorine room at the existing well facility. This improvement will be completed within the 6-year planning period.

TRANSMISSION AND DISTRIBUTION SYSTEM

Chapter 3 evaluated the distribution system's capacity and ability to provide adequate system pressures and fire flows. The following projects will address improvements in the distribution system.

D-1: Leak Detection Survey

Estimated Project Cost: $5,000

The City has significant distribution system leakage. A leak detection survey will be conducted as soon as possible to determine if there are any major leaks within the system that are contributing to lost water. This improvement is placed in the 6-year planning period.

D-2: Distribution System Improvements

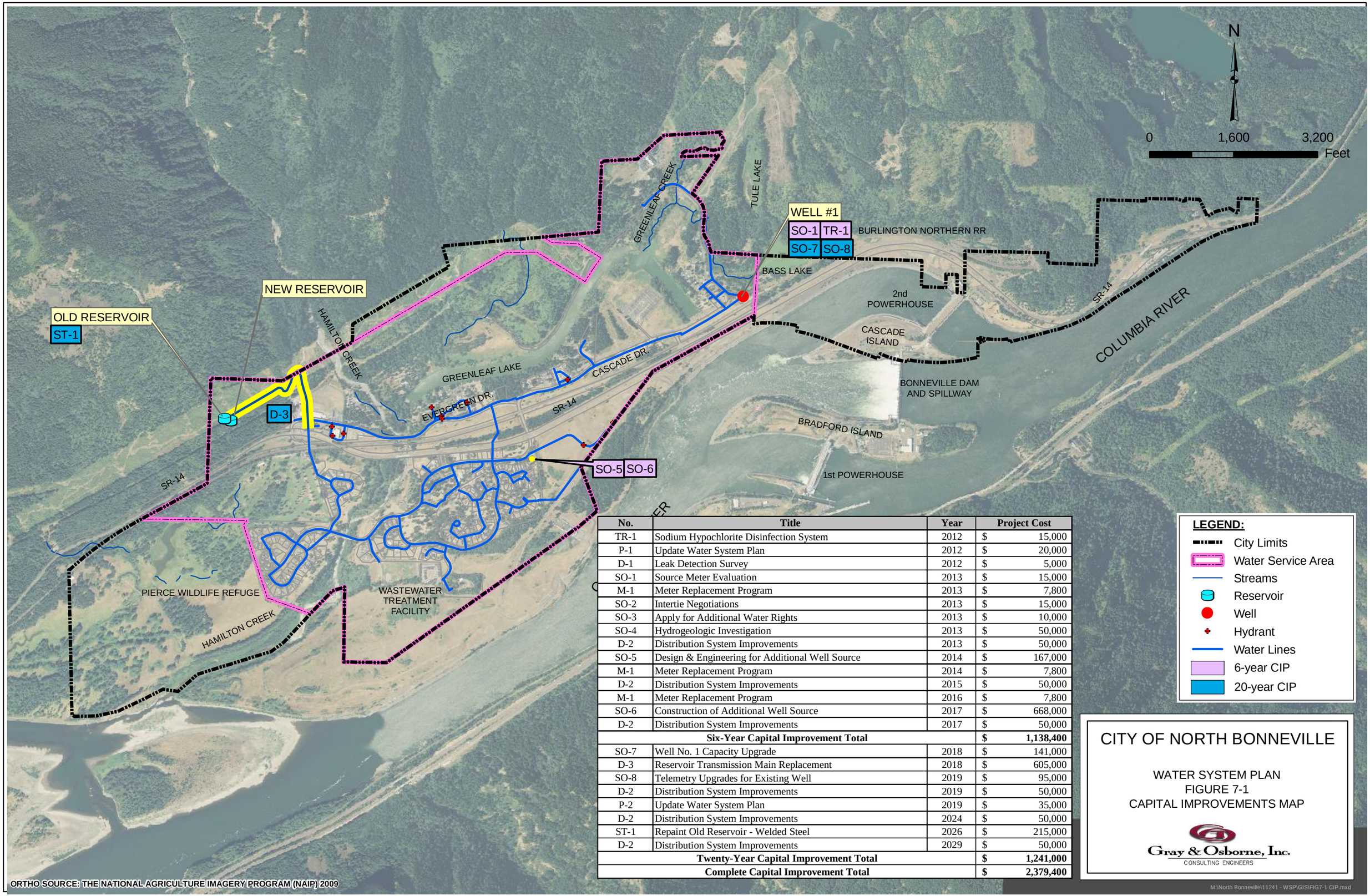
Estimated Project Cost: $300,000 ($50,000/year for 6 years)

This project is to repair leaks found during the leak detection survey, and any other distribution system improvements that may occur within the 6- and 20-year planning horizons. This is a budgetary figure that will be reviewed and revised as necessary after the leak detection survey. This project has been included six times in the CIP so the City can be financially prepared to make distribution system improvements to reduce their DSL.

D-3: Reservoir Transmission Main Replacement

Estimated Project Cost: $605,000

2,700 lineal feet of 14-inch transite main currently provide transmission to and from the reservoirs. This line has reached the end of its useful life and is suspected to be leaking.



No.	Title	Year	Project Cost
TR-1	Sodium Hypochlorite Disinfection System	2012	$ 15,000
P-1	Update Water System Plan	2012	$ 20,000
D-1	Leak Detection Survey	2012	$ 5,000
SO-1	Source Meter Evaluation	2013	$ 15,000
M-1	Meter Replacement Program	2013	$ 7,800
SO-2	Intertie Negotiations	2013	$ 15,000
SO-3	Apply for Additional Water Rights	2013	$ 10,000
SO-4	Hydrogeologic Investigation	2013	$ 50,000
D-2	Distribution System Improvements	2013	$ 50,000
SO-5	Design & Engineering for Additional Well Source	2014	$ 167,000
M-1	Meter Replacement Program	2014	$ 7,800
D-2	Distribution System Improvements	2015	$ 50,000
M-1	Meter Replacement Program	2016	$ 7,800
SO-6	Construction of Additional Well Source	2017	$ 668,000
D-2	Distribution System Improvements	2017	$ 50,000
Six-Year Capital Improvement Total			**$ 1,138,400**
SO-7	Well No. 1 Capacity Upgrade	2018	$ 141,000
D-3	Reservoir Transmission Main Replacement	2018	$ 605,000
SO-8	Telemetry Upgrades for Existing Well	2019	$ 95,000
D-2	Distribution System Improvements	2019	$ 50,000
P-2	Update Water System Plan	2019	$ 35,000
D-2	Distribution System Improvements	2024	$ 50,000
ST-1	Repaint Old Reservoir - Welded Steel	2026	$ 215,000
D-2	Distribution System Improvements	2029	$ 50,000
Twenty-Year Capital Improvement Total			**$ 1,241,000**
Complete Capital Improvement Total			**$ 2,379,400**

LEGEND:

- City Limits
- Water Service Area
- Streams
- Reservoir
- Well
- Hydrant
- Water Lines
- 6-year CIP
- 20-year CIP

CITY OF NORTH BONNEVILLE

WATER SYSTEM PLAN
FIGURE 7-1
CAPITAL IMPROVEMENTS MAP

Gray & Osborne, Inc.
CONSULTING ENGINEERS

M:\North Bonneville\11241 - WSP\GIS\FIG7-1 CIP.mxd

This project will construct a parallel 14-inch PVC transmission main to replace the old transite line. The cost assumes that construction will take place outside of the paved roadway. Repaving is not included in the cost. The estimated project cost includes engineering and construction. This project is scheduled in the 20-year planning period.

METERS

M-1: Meter Replacement Program

Estimated Project Cost: $23,400 ($7,800/year for 3 years)

The City replaces meters on an ongoing basis when they reach the end of their useful life. The replacement of meters may also lead to more accurate consumption readings and reduce distribution system leakage. This project assumes that half of the City's residential meters will be replaced over six years. The total cost is distributed biennially over the 6-year planning period.

SOURCE

SO-1: Source Meter Evaluation

Estimated Project Cost: $15,000

The City believes that the source meter at the wellhouse provides inaccurate readings and therefore contributes to high DSL. This project will evaluate the existing source meter, and calibrate the meter to determine its accuracy. The project cost does not include a replacement meter. This project is placed in the 6-year planning period to pinpoint a source of distribution system leakage.

SO-2: Intertie Feasibility Analysis

Estimated Project Cost: $15,000

The City requires additional source capacity within the 6-year planning period if leakage is not reduced and a backup water supply in case of an emergency. This project includes approaching the local Golf Course and Bonneville Dam for the development of an intertie. The cost includes attorney fees for negotiating and a general engineering feasibility report. The report will look at potential right-of-way issues, permitting requirements, and potential alignments. The report will not provide surveying or engineering design. The preliminary construction cost will be determined during negotiations. This item is placed in the 6-year planning period.

SO-3: Apply for Additional Water Rights

Estimated Project Cost: $10,000

This project includes an application to the Department of Ecology for an additional point of withdrawal under their existing water rights to develop another well to serve the City. The City requires additional capacity to meet maximum day demands in 2019 if distribution system leakage is not reduced. Additionally, the City has no redundancy in its system should the well become inoperable. This project is placed in the 6-year planning period.

SO-4: Hydrogeologic Investigation

Estimated Project Cost: $50,000

The City will have a hydrogeologic investigation performed to determine if the aquifer used at the existing well can supply the full water right of 1,000 gpm. The study will also evaluate other locations within the City where an additional well may be developed. The additional well will be considered an 'additional point of withdrawal' under the City's existing water rights. The investigation will be performed by a licensed hydrogeologist and will include a pump test of the existing well, monitoring levels of adjacent wells, and a report of the findings with additional locations for well development. This project will allow the City to determine how to provide redundancy within the system, and provide additional capacity. These two requirements will be met by a combination of these projects: SO-2, SO-5 and SO-7. Because source capacity will be required in 2020 if DSL is not reduced, this project is scheduled in the 6-year planning period.

SO-5 and SO-6: Design and Construction of Additional Well Source

Estimated Project Cost: $835,000 (SO-5: $167,000 Design and Engineering, SO-6: $668,000 Construction)

Based on the findings of the hydrogeologic investigation, this project will develop an additional well source for reliability and to meet projected maximum day demands. This item is dependent on obtaining an additional point of withdrawal (SO-3) and the findings of the hydrogeologic study (SO-4). This project includes engineering design, well drilling, and construction of the wellhouse, pumping and treatment equipment. Treatment will include chlorination for maintaining a distribution system residual and corrosion control with sodium silicate. This improvement is placed in the 6-year planning period.

SO-7: Well No. 1 Capacity Upgrade

Estimated Project Cost: $141,000

This project will upgrade the capacity of the finished water pump that pumps chlorinated water from the clearwell below the pump building, from 600 gpm to 1,000 gpm. The well pump is capable of supplying the full water right of 1,000 gpm, but the finished water pump out of the clearwell limits the capacity to 600 gpm. This project will allow the City to meet maximum day demands through 2031, assuming DSL remains at the current level of 37 percent. This project is dependent on the findings of the hydrogeologic investigation because the City will need to demonstrate that the well can consistently withdraw 1,000 gpm from the aquifer. Because source capacity is required in 2020 if DSL is not reduced, this project is scheduled for the beginning of the 20-year planning period.

SO-8: Telemetry Upgrades at Existing Well

Estimated Project Cost: $95,000

Water level pressure transducers will be placed in the well to allow the City to monitor the water level at all times. The existing telemetry system will be upgraded to include pump operating status, water levels, flow rates, and totalized flows at the well. This improvement is placed in the 20-year planning period.

PLANNING DOCUMENTS

P-1: Water System Plan Update

Estimated Project Cost: $20,000

The City is currently budgeting for this update to their Water System Plan. This improvement is placed in the 6-year planning period.

P-2: Water System Plan Update

Estimated Project Cost: $35,000

The City will be required to update this Water System Plan 6 years after it is approved by DOH. This improvement is placed in the 20-year planning period.

CAPITAL IMPROVEMENT SUMMARY AND SCHEDULE

Table 7-1 provides a summary and proposed schedule of the identified projects. Costs shown in Table 7-1 are in year 2012 dollars.

TABLE 7-1

City of North Bonneville Summary of Capital Improvement Projects

No.	Title	Year	Project Cost
Capital Improvements 2012 - 2017			
TR-1	Sodium Hypochlorite Disinfection System	2012	$15,000
P-1	Update Water System Plan	2012	$20,000
D-1	Leak Detection Survey	2012	$5,000
SO-1	Source Meter Evaluation	2013	$15,000
M-1	Meter Replacement Program	2013	$7,800
SO-2	Intertie Negotiations	2013	$15,000
SO-3	Apply for Additional Water Rights	2013	$10,000
SO-4	Hydrogeologic Investigation	2013	$50,000
D-2	Distribution System Improvements	2013	$50,000
SO-5	Design and Engineering for Additional Well Source	2014	$167,000
M-1	Meter Replacement Program	2014	$7,800
D-2	Distribution System Improvements	2015	$50,000
M-1	Meter Replacement Program	2016	$7,800
SO-6	Construction of Additional Well Source	2017	$668,000
D-2	Distribution System Improvements	2017	$50,000
6-Year Capital Improvement Total			**$1,138,400**
Capital Improvements 2018 - 2032			
SO-7	Well No. 1 Capacity Upgrade	2018	$141,000
D-3	Reservoir Transmission Main Replacement	2018	$605,000
SO-8	Telemetry Upgrades for Existing Well	2019	$95,000
D-2	Distribution System Improvements	2019	$50,000
P-2	Update Water System Plan	2019	$35,000
D-2	Distribution System Improvements	2024	$50,000
ST-1	Repaint Old Reservoir - Welded Steel	2026	$215,000
D-2	Distribution System Improvements	2029	$50,000
20-Year Capital Improvement Total			**$1,241,000**
Complete Capital Improvement Total			**$2,379,400**

(1) Costs are in 2012 dollars.

CHAPTER 8

FINANCIAL ANALYSIS

INTRODUCTION

This chapter contains analysis of the City's ability to meet future operating expenses and fund water improvements outlined in the previous chapters.

FINANCIAL STATUS OF EXISTING WATER UTILITY

CURRENT WATER RATES

The City's water rates are defined in North Bonneville Municipal Code (NBMC) 13.04.060, Water Rate Schedule.

Charges accrue monthly, but customers are billed every other month. Meters are also read every other month. There are no separate classifications among customers.

The monthly water rate structure was revised via ordinance 982 in 2011 to be based on usage regardless of class. The current rate structure, effective January 1, 2013, is provided in Table 8-1. The Base Rate is a fixed monthly amount intended to pay for the maintenance of the water system. The Usage Rate is based on consumption and is intended to pay for the variable costs of the system.

TABLE 8-1

Monthly Billing Rates

Rate Component	Monthly Charge
Base Rate	$20.89
Usage Rate per 100 CF	$1.72

Per North Bonneville Municipal Code 13.04.060, on January 1st of each year these rates shall increase according to the Consumer Price Index for All Urban Consumers (CPI-U) as of August of the previous year, rounded to the nearest penny.

SYSTEM HOOKUP CHARGES

New customers are required to pay fees to offset the costs of extending service to the new customer. Hookup charges are based on meter size and are detailed in Table 8-2.

TABLE 8-2

New Customer Hookup Fees

Meter Size	Fees
Up to and including 1"	$4,000
1.25" and 1.5"	$5,000
2"	$6,500
3"	$7,500
4"	$9,000
6"	$11,000
8"	$13,000
10"	$15,000

HISTORIC FINANCIAL OPERATIONS

Water utility cash balances, revenues and expenses for the years 2008 to 2012 are summarized in Table 8-3. Figures include the 2012 projections as provided by the City. Water sales were not sufficient to meet expenses prior to the 2011 rate increases, thus necessitating interfund loans. Along with the 2011 rate increases, staff restructured the water department expenses and believes the rates are now sufficient to support expenses, including retirement of the interfund loans over time.

TABLE 8-3

Historic Operating Revenue and Expenditures Summary

Operating Expenditures	2008	2009	2010	2011	2012
Beginning Capital Res. Cash Balance	$178,629	$176,038	$214,189	$211,837	$96,962
Beginning Operating Cash Balance	$9,864	$10,890	$12,878	($18,415)	$8,280
Total Beginning Cash Balance	**$188,493**	**$186,928**	**$227,067**	**$193,422**	$105,242
Charges for Services	$185,087	$128,596	$117,654	$141,533	$161,752
Connection Charges	$4,000	$40,000	-	-	-
Interfund Loan Repayments	-	-	-	$173,302	$18,200
Interfund Loans	-	$100,000	$40,000	$20,000	-
Total Revenues	**$189,087**	**$268,596**	**$157,654**	**$334,835**	$179,952
Total Capital Res. Expenditures	$6,591	$1,849	$2,352	$288,177*	$40,815
Total Operating Expenditures	$184,061	$226,608	$188,947	$134,838	$162,397
Total Expenditures	**$190,652**	**$228,457**	**$191,299**	**$423,015**	$203,212
Ending Capital Res. Cash Balance	$176,038	$214,189	$211,837	$96,962	$74,347
Ending Operating Cash Balance	$10,890	$12,878	($18,415)**	$8,280	$7,635
Total Ending Cash Balance	**$186,928**	**$227,067**	**$193,422**	**$105,242**	$81,892
Net Revenue	**($1,565)**	**$40,139**	**($33,645)**	**($88,180)**	($23,260)

* 2011 Expenditures included $251,684 in interfund loans.
** The 2009/2010 audit discovered significant accounting errors requiring cash balance adjustments, resulting in negative ending fund balances.

PROJECTED OPERATING REVENUES AND EXPENSES

Table 8-3 shows the historic data upon which the following predictions were based. Table 8-4 provides forecast factors used to determine projections. The ERU growth rate was taken as equal to the City's population growth rate, which is detailed in Chapter 2.

TABLE 8-4

Forecast Factors

Forecast Factors	Value
Water ERU Growth Rate	4.35%
Annual Rate Increase	2.5%
Annual O&M Increase	3.5%
General Inflation Rate	2.5%
Project Cost Inflation Rate	5.0%

FUTURE REVENUES

Table 8-5 is the 6-year operating budget for the City's water utility and summarizes projected water utility revenues for the years 2012 through 2017. Future revenues have been projected based on a review of the historical water revenues provided by the city and by using the forecast factors described in Table 8-5. The City's water rates are set to increase according to CPI, which has historically averaged about 2.5 percent annually.

Projected O&M cost increases are greater than projected rate increases. However, additional revenues from new ERUs (customers) should more than make up for this difference.

Major capital investments are anticipated to be met in part through connection fees and in part through external funding sources (loans or grants). Without such external funding sources, major upgrades such as an additional well and the replacement of the 14-inch transite main will not be within the utility's financial capacity. Table 8-5 assumes the City will be able to issue bonds at 5 percent interest. The City anticipates being able to support projected bond payments under its current rate structure (with anticipated annual increases and revenue from new customers).

FUTURE EXPENDITURES

Table 8-5 summarizes projected water utility expenses for the years 2012 through 2017. Future expenses have been projected based on a review of the historic financial data provided by the City and the use of the forecast factors described in Table 8-4. Operations and maintenance costs are projected to increase with the cost of living adjustment rate and the general inflation rate. Interfund loan repayments included in the schedule are based on repayment schedules.

TABLE 8-5

Projected Revenue and Expenditures Summary

Water Growth	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
ERUs[1]	421	439	458	478	499	521
Residential Base Rate[3]	$17.64	$18.08	$18.53	$19.00	$19.47	$19.96
Water Revenues	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Water Sales[2][3]	$141,857	$157,117	$168,015	$179,736	$192,323	$205,822
Connection Fees	-	$72,000	$76,000	$80,000	$84,000	$88,000
Interfund Loan Repayments	$18,200	$22,750	$21,297	$16,894	-	-
Grant/Loan Funding	-		$100,000	-	-	$500,000
Total Revenue	**$165,200**	**$251,867**	**$365,312**	**$276,630**	**$276,323**	**$893,822**
Expenditures	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
O&M Total[4]	$104,857	$108,527	$112,325	$116,257	$120,326	$124,537
Capital Improvements[6][8]	$40,000	$155,190	$192,717	$57,881	$9,481	$916,370
External Loans (Principal + Interest)	$12,508	$12,508	$12,508	$16,492	$16,492	$16,492
Interfund Loans (Principal + Interest)	$30,000	$40,000	$45,000	$35,461	-	-
Expenditures Total	**$187,365**	**$316,225**	**$362,550**	**$226,091**	**$146,298**	**$1,057,399**
Operating Cash Flows	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Beginning Cash Balance[7]	$105,242	$83,077	$18,719	$21,481	$72,020	$202,045
Total Revenues	$165,200	$251,867	$365,312	$276,630	$276,323	$893,822
Total Expenditures	$187,365	$316,225	$362,550	$226,091	$146,298	$1,057,399
Ending Cash Balance[7]	$83,077	$18,719	$21,481	$72,020	$202,045	$38,468

(1) From Chapter 2 Table 2-11.
(2) Adjusted using water ERU growth rate described in Table 8-4.
(3) Adjusted using annual rate increase described in Table 8-4.
(4) Adjusted using annual O&M increase described in Table 8-4.
(5) Adjusted using general inflation rate described in Table 8-4.
(6) Adjusted using project cost inflation rate described in Table 8-4.
(7) Combined from O&M, Water Construction and Water Equipment Funds.
(8) Yearly total capital improvement costs from Table 7-1.

APPENDIX A

WFI

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

WATER FACILITIES INVENTORY (WFI) FORM

ONE FORM PER SYSTEM

Quarter: 2
Updated: 04/08/2010
Printed: 7/19/2011
WFI Printed For: On-Demand
Submission Reason: Other

RETURN TO: Southwest Regional Office, PO Box 47823, Olympia, WA, 98504

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
60150 L	NORTH BONNEVILLE, CITY OF	SKAMANIA	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS	7. OWNER NAME & MAILING ADDRESS	8. Owner Number 004084
RAY HAYS [UTILITIES MANAGER] PO BOX 7 NORTH BONNEVILLE, WA 98639	NORTH BONNEVILLE, CITY OF RAY HAYS PO BOX 7 NORTH BONNEVILLE, WA 98639	TITLE: OWNER CONTACT
STREET ADDRESS IF DIFFERENT FROM ABOVE	**STREET ADDRESS IF DIFFERENT FROM**	
ATTN ADDRESS 214 CBD MALL CITY NORTH BONNEVILLE STATE WA ZIP 98639	ATTN ADDRESS 214 CBD MALL CITY NORTH BONNEVILLE STATE WA ZIP 98639	

9. 24 HOUR PRIMARY CONTACT INFORMATION	10. OWNER CONTACT INFORMATION
Primary Contact Daytime Phone: (509) 427-8182	Owner Daytime Phone: (509) 427-8182
Primary Contact Mobile/Cell Phone:	Owner Mobile/Cell Phone:
Primary Contact Evening Phone: (xxx) xxx-xxxx	Owner Evening Phone: (xxx) xxx-xxxx
Fax: | E-mail:	Owner Fax Phone: | E-mail:

WAC 246-290-420(9) requires that water systems provide 24-hour contact information for emergencies.

11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)

- [X] Not applicable (Skip to #12)
- [ ] Owned and Managed — SMA NAME: _____ SMA Number
- [ ] Managed Only
- [ ] Owned Only

12. WATER SYSTEM CHARACTERISTICS (mark all that apply)

[ ] Agricultural	[ ] Hospital/Clinic	[X] Residential
[X] Commercial / Business	[X] Industrial	[ ] School
[ ] Day Care	[ ] Licensed Residential Facility	[ ] Temporary Farm Worker
[ ] Food Service/Food Permit	[X] Lodging	[ ] Other (church, fire station, etc.):
[ ] 1,000 or more person event for 2 or more days per year	[ ] Recreational / RV Park	

13. WATER SYSTEM OWNERSHIP (mark only one)

[ ] Association	[ ] County	[ ] Investor	[ ] Special District
[X] City / Town	[ ] Federal	[ ] Private	[ ] State

14. STORAGE CAPACITY (gallons)

1,000,000

15	16	17	18 SOURCE CATEGORY									19 USE			20	21 TREATMENT					22	23	24 SOURCE LOCATION			
SOURCE NUMBER	SOURCE NAME LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER Example: WELL #1 XYZ456 IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE	INTERTIE INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL	SPRING	SPRING FIELD	SPRING IN A SPRING	SEAWATER	SURFACE WATER	RUNNEY/INF.	OTHER	PERMANENT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	DEPTH TO FIRST OPEN INTERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	WELL #1 AFP641		X									X			Y		X				X	110	625	NE NW	21	02N	07E

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
60150 L	NORTH BONNEVILLE, CITY OF	SKAMANIA	A	Comm

	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY! APPROVED CONNECTIONS
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)	0	341	458
A. Full Time Single Family Residences (Occupied 180 days or more per year)	246		
B. Part Time Single Family Residences (Occupied less than 180 days per year)	0		
26. MULTI-FAMILY RESIDENTIAL BUILDINGS (How many of the following do you have?)			
A. Apartment Buildings, condos, duplexes, barracks, dorms	20		
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied more than 180 days/year	95		
C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied less than 180 days/year	0		
27. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)			
A. Recreational Services and/or Transient Accommodations (Campsites, RV sites, hotel/motel/overnight units)	0	0	0
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	26	26	3
28. TOTAL SERVICE CONNECTIONS		367	461

29. FULL-TIME RESIDENTIAL POPULATION

A. How many residents are served by this system 180 or more days per year? 882

30. PART-TIME RESIDENTIAL POPULATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?												
B. How many days per month are they present?												

31. TEMPORARY & TRANSIENT USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many total visitors, attendees, travelers, campers, patients or customers have access to the water system each month?												
How many days per month is water accessible to the public?												

32. REGULAR NON-RESIDENTIAL USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. If you have schools, daycares, or businesses connected to your water system, how many students daycare children and/or employees are present each month?												
B. How many days per month are they present?												

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	1	1	1	1	1	1	1	1	1	1	1	1

35. Reason for Submitting WFI:

☐ Update - Change ☐ Update - No Change ☐ Inactivate ☐ Re-Activate ☐ Name Change ☐ New System ☐ Other _____

36. I certify that the information stated on this WFI form is correct to the best of my knowledge.

SIGNATURE: _____

DATE: _____

PRINT NAME: _____

TITLE: _____

APPENDIX B

WATER RIGHT DOCUMENTATION AND SELF ASSESSMENT

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

Table 2

WATER SYSTEM PLAN
WATER RIGHTS SELF ASSESSMENT – 6 YEAR FORECAST

PERMIT CERTIFICATE OR CLAIM #	NAME ON DOCUMENT	PRIORITY DATE (List oldest first)	SOURCE NAME/ NUMBER	ANY PORTION SUPPLEMENTAL? (If yes, explain in footnote)	EXISTING WATER RIGHTS		FORECASTED WATER USE FROM SOURCES (6-year Demand)		FORECASTED WATER RIGHT STATUS (Excess/Deficiency)	
					Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
Permits/ Certificates 1. G2-24064	U.S. Army Corps of Engineers for the Town of North Bonneville	02/11/1976	Well	No	1000 gpm	336 acre-ft	625 gpm	268 acre-ft	375 gpm	68 acre-ft
2.										
3.										
4.										
Claims 1.										
TOTAL	**********	*********	*********	**********	1000 gpm	336 acre-ft	625 gpm	268 acre-ft	375 gpm	68 acre-ft

INTERTIE NAME/ IDENTIFIER	NAME OF PURVEYOR PROVIDING WATER	EXISTING LIMITS ON INTERTIE USE		FORECASTED CONSUMPTION THROUGH INTERTIE		FORECASTED INTERTIE SUPPLY STATUS (Excess/Deficiency)	
		Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
1.							
2.							
3.							
TOTAL	**********						

PENDING WATER RIGHT APPLICATION (New/Change)	NAME ON APPLICATION	DATE SUBMITTED	ANY PORTION SUPPLEMENTAL? (If yes, explain in footnote)	PENDING WATER RIGHTS	
				Maximum Instantaneous Flow Rate (Qi) Requested	Maximum Annual Volume (Qa) Requested
1. Change to G2-24064	Not yet submitted	N/A	YES(1)	1000 gpm	336 acre-ft
2.					
3.					
1.					

(1) The City will apply for permission to develop an additional point of withdrawal under their existing water right in the 6 year planning period. The City will not be requesting additional water rights, but will be requesting on developing an alternate source for reliability. The City will not exceed 1,000 gpm or 336 acre-ft per year between the two sources.

To return form, please see reverse side.

Please return completed form to the Office of Drinking Water regional office checked below.

☐ NWRO Drinking Water
Department of Health
20435 72nd Ave. S, Ste 200
Kent, WA 98032-2358
Fax: (253) 395-6750

☒ SWRO Drinking Water
Department of Health
PO Box 47823
Olympia, WA 98504-7823
Fax: (360) 664-8058

☐ ERO Drinking Water
Department of Health
1500 W. Fourth Ave, Suite 305
Spokane, WA 99201
Fax: (509) 456-3115

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

Table 3

WATER SYSTEM PLAN
WATER RIGHTS SELF ASSESSMENT – 20 YEAR FORECAST

PERMIT CERTIFICATE OR CLAIM #	NAME ON DOCUMENT	PRIORITY DATE (List oldest first)	SOURCE NAME/ NUMBER	ANY PORTION SUPPLEMENTAL? (If yes, explain in footnote)	EXISTING WATER RIGHTS		FORECASTED WATER USE FROM SOURCES (20-year Demand)		FORECASTED WATER RIGHT STATUS (Excess/Deficiency)	
					Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
Permits/ Certificates 1. G2-24064	U.S. Army Corps of Engineers for the Town of North Bonneville	02/11/1976	Well	No	1000 gpm	336 acre-ft	1000 gpm	508 acre-ft	0 gpm	-172 acre-ft
2.										
3.										
4.										
Claims 1.										
TOTAL	**********	*********	*********	**********	1000 gpm	336 acre-ft	1000 gpm	508 acre-ft	0 gpm	-172 acre-ft

INTERTIE NAME/ IDENTIFIER	NAME OF PURVEYOR PROVIDING WATER	EXISTING LIMITS ON INTERTIE USE		FORECASTED CONSUMPTION THROUGH INTERTIE		FORECASTED INTERTIE SUPPLY STATUS (Excess/Deficiency)	
		Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
1.							
2.							
3.							
TOTAL	**********						

PENDING WATER RIGHT APPLICATION (New/Change)	NAME ON APPLICATION	DATE SUBMITTED	ANY PORTION SUPPLEMENTAL? (If yes, explain in footnote)	PENDING WATER RIGHTS	
				Maximum Instantaneous Flow Rate (Qi) Requested	Maximum Annual Volume (Qa) Requested
1. Change to G2-24064	Not yet submitted	N/A	YES(1)	1000 gpm	336 acre-ft
2.					
3.					
1.					

(1) The City will apply for permission to develop an additional point of withdrawal under their existing water right in the 6 year planning period. The City will not be requesting additional water rights, but will be requesting on developing an alternate source for reliability. The City will not exceed 1,000 gpm or 336 acre-ft per year between the two sources.

The Department of Health is an equal opportunity agency. For persons with disabilities, this document is available on request in other formats. To submit a request, please call 1-800-525-0127 (TTY 1-800-833-6388). For additional copies of this form, call 1-800-521-0323. This and other forms are available at http://www.doh.wa.gov/ehp/dw

To return form, please see reverse side.

Please return completed form to the Office of Drinking Water regional office checked below.

☐ NWRO Drinking Water
Department of Health
20435 72nd Ave. S, Ste 200
Kent, WA 98032-2358
Fax: (253) 395-6750

☒ SWRO Drinking Water
Department of Health
PO Box 47823
Olympia, WA 98504-7823
Fax: (360) 664-8058

☐ ERO Drinking Water
Department of Health
1500 W. Fourth Ave, Suite 305
Spokane, WA 99201
Fax: (509) 456-3115

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

Table 1

WATER SYSTEM PLAN
WATER RIGHTS SELF ASSESSMENT – EXISTING STATUS

PERMIT CERTIFICATE OR CLAIM #	NAME ON DOCUMENT	PRIORITY DATE (List oldest first)	SOURCE NAME/ NUMBER	ANY PORTION SUPPLEMENTAL? (If yes, explain in footnote)	EXISTING WATER RIGHTS		EXISTING CONSUMPTION		CURRENT WATER RIGHT STATUS (Excess/Deficiency)	
					Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
Permits/ Certificates 1. G2-24064	U.S. Army Corps of Engineers for the Town of North Bonneville	02/11/1976	Well	No	1000 gpm	336 acre-ft	625 gpm	208 acre-ft	375 gpm	128 acre-ft
2.										
3.										
4.										
Claims 1.										
TOTAL	**********	*********	*********	**********	1000 gpm	336 acre-ft	625 gpm	208 acre-ft	375 gpm	128 acre-ft

INTERTIE NAME/ IDENTIFIER	NAME OF PURVEYOR PROVIDING WATER	EXISTING LIMITS ON INTERTIE USE		EXISTING CONSUMPTION THROUGH INTERTIE		CURRENT INTERTIE SUPPLY STATUS (Excess/Deficiency)	
		Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
1.							
2.							
3.							
TOTAL	**********						

PENDING WATER RIGHT APPLICATION (New/Change)	NAME ON APPLICATION	DATE SUBMITTED	ANY PORTION SUPPLEMENTAL? (If yes, explain in footnote)	PENDING WATER RIGHTS	
				Maximum Instantaneous Flow Rate (Qi) Requested	Maximum Annual Volume (Qa) Requested
1.					
2.					
3.					
1.					

To return form, please see reverse side.

Please return completed form to the Office of Drinking Water regional office checked below.

☐ NWRO Drinking Water
Department of Health
20435 72nd Ave. S, Ste 200
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☐ ERO Drinking Water
Department of Health
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Spokane, WA 99201
Fax: (509) 456-3115

APPENDIX C

CONSUMER CONFIDENCE REPORT

CITY OF NORTH BONNEVILLE
Annual Drinking Water Quality Report
For the Year 2010

We are pleased to present to you this year's Annual Water Quality Report. This report is designed to inform you about the water quality and services we deliver to you every day. Our constant goal is to provide you with a safe and dependable supply of drinking water. We want you to understand the efforts we make to continually improve the water treatment process and protect our water resources. We are committed to ensuring the quality of your water.

This report shows our water quality and what it means to you. If you have any questions about this report or our water utility, please contact Ray Hays, Utility Manager, at City Hall (509)427-8182. We want our valued customers to be informed about their water quality. If you want to learn more or have your questions addressed in person, we request you attend any of our regularly scheduled City Council meetings. They are held on the second and fourth Tuesday of each month beginning at 6:30 pm at City Hall.

The Source

Our water source is called the BSA Aquifer, which extends under the Columbia River to the Oregon side and flows towards the Pacific Ocean. Our water system currently consists of one well, two reservoirs and approximately 43,200 feet of pipeline running throughout the city. As of December 2010 we served approximately 390 connections.

The Report

The City of North Bonneville routinely monitors for constituents in your drinking water according to Federal and State laws. These test results are from water samples taken during 2010 at our well site. The state does not require us to monitor for every possible contaminant every year because the concentrations of these contaminants are not expected to vary significantly from year to year. Some of the data, though representative of the water quality, is more than one year old, and is indicated as such.

All drinking water, including bottled drinking water, may be reasonably expected to contain at least small amounts of some constituents. It is important to remember that the presence of these constituents does not necessarily pose a health risk.

The Results

On the element table you will find many terms and abbreviations you may not be familiar with. To help you better understand these terms we have provided the following definitions:

Nephelometric Turbidity Unit **(NTU)** – a measure of the clarity of water. Turbidity in excess of 5 NTU is barely noticeable to the average person.
Action Level **(AL)** – the contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
State Reporting Level **(SRL)** – indicates the minimum reporting level required by WA State Dept. of Health.
Maximum Contaminant Level Goal **(MCLG)** – the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Maximum Contaminant Level **(MCL)** – the "maximum allowed" is 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.

MCLs are set at very stringent levels. To understand the possible health effects described for many regulated constituents, a person would have to drink 2 liters of water every day at the MCL level for a lifetime to have a one-in-a-million chance of having the described health effect.

No Detection **(ND)** – indicates that no traces of this element were found.

Corrosion Control

The city uses Sodium Silicate to control corrosion throughout the water distribution system. Sodium Silicate is a proven corrosion control inhibitor, effective on a variety of metals, including Lead, Zinc and Copper. Since 1921 the English have used Sodium Silicate to control corrosion in their drinking water. Sodium Silicate reacts with metal surfaces to form a protective barrier against corrosion. It also increases PH, another important corrosion control mechanism. The reason we chose Sodium Silicate over other types of corrosion control chemicals was due to the fact that it is safe, time tested, easy to handle, store, and apply. It is also environmentally safe and a natural way to inhibit corrosion.

The City tested for lead and copper at 10 different sites throughout the City. Our corrosion control program is working well.

By Federal and State law we are required to use a corrosion control inhibitor due to the PH of our water.

Environmental Protection Agency's Safe Drinking Water Hotline

All 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 the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791.

Especially Vulnerable Persons

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

General Information

The city does not add fluoride to the water.

Our water naturally contains high levels of iron and manganese. When exposed to the air, these minerals form a brown or black stain. The Sodium Silicate that is used for the corrosion control helps eliminate this condition. There are also many over-the-counter products available that will remove these stains.

The city's drinking water is disinfected by adding a small amount of chlorine at the city well. This is standard practice to ensure safe drinking water and there is no risk to the consumer.

The City is required to test the drinking water monthly for microbiological contaminants. All of the tests results were good 2010.

We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards. On November 5, 2008, April 14, 2010 and again on August 2, 2010 we tested for Nitrates as required, and the test results showed the city's compliance with the State's MCL. The city also tested for TTHM's and HAA5's, which are byproducts of Chlorine. This was also found to be well below the State's limits.

The next round of testing will be in 2011. That test will be for herbicides, general pesticides, nitrates and lead/copper. The city has also tested for Radio nuclides such as Gross Alpha and Radium 228. These test results also were well under the State's limits.

In May of 2008, the Department of Health performed a Water System Sanitary Survey. That survey did not show any problems with our water system or testing. This survey is conducted every three years the next is due this year.

System Improvements

The city takes pride in the ability to provide your family with clean, quality drinking water. In order to maintain a safe and dependable water supply we sometimes need to make improvements on that system that will benefit all of our customers. We are currently planning to drill a secondary well to add additional capacity and redundancy to the system.

Water Conservation Tips

Check for drips and leaks.
Slow drips and running toilets can waste approximately 20 gallons a day.

Leaky toilet:

(1)Remove tank lid (water is clean until it enters the bowl); (2) Add food coloring or dye, replace lid, don't flush; (3) After an hour, check the bowl to see if the water is colored. If it is, even slightly, then you have a leak that needs fixing.

Leaky faucet:

A leaking or dripping faucet is frequently the result of a bad rubber washer. The washer on a sink is typically located under the handle, and is relatively easy to replace. Check the local hardware store or home centers for parts and instructions. You may also find instructions on the internet.

Unusually high usage:

Do you actually have a leak or are you just using more water than you realize? Many customers are surprised as to just how much water they are actually using. By using the following steps you can discover if you have a mysterious leak. (1) Locate your water meter. Most meters are about 14 feet back from the street curb (at the end of the city's right-of-way). (2) Turn off all faucets inside and outside of your home. (3) Check the meter. If no water is being used the meter will not be moving. If the meter is moving and all faucets are turned off you have a leak.

If you do find that you have a leak or broken line, you are responsible for fixing it or hiring someone to fix it for you. The City is responsible for the water line from the street up to the meter. The property owner is responsible for the water line from the meter up to and throughout the residence.

APPENDIX D

WATER QUALITY RECORDS

60150 L

Water Quality Monitoring Report for the Year 2011

System: NORTH BONNEVILLE, CITY OF PWSID: 60150 L Report Date: 03/02/2011

Contact: RAY HAYS Group: A - Comm County: SKAMANIA Region: SOUTHWEST

Part 1: List of Active Sources with Water Quality Monitoring Requirements

DOH Source#	Name	Type	Use	Susceptibility Rating
S01	WELL #1 AFP641	Well	Permanent	Moderate

Part 2: Sampling Schedule for the Year 2011

Coliform Sampling (Routine)	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
	1	1	1	1	1	1	1	1	1	1	1	1

* Indicates the requirement is an exception from WAC 246-290.

- If the coliform (bacteriological) sampling schedule listed at the bottom of the current Water Facilities Inventory (WFI) form for your system is different from the schedule listed above, follow the schedule on the current WFI.
- Samples must be collected from representative points throughout the distribution system.
- Repeat samples are required following an unsatisfactory sample. In addition, collect a sample from each operating groundwater source.
- A minimum of 5 routine samples are required the month following one or more unsatisfactory samples in accordance with your system's Coliform Monitoring Plan.

Lead and Copper Distribution Sampling

- Lead and copper samples must be collected from indoor faucets within the distribution system after the water has sat unused in the pipes for at least 6 hours but no more than 12 hours.
- Sample faucets should be flushed with cold water the evening prior to collecting the sample.
- Part 2 indicates the month in which samples should be collected. Part 4 indicates the total number of sample required.
- If you are required to sample annually or once every 3 years, samples must be collected between June and September.

Chlorine Residual Sampling

- Systems that use continuous chlorination must take chlorine residual measurements daily (or at a reduced frequency approved by the department), and at the same time and location as routine and repeat coliform samples.

Disinfection Byproducts Sampling

- Systems that use continuous chlorination treatment must collect samples for total trihalomethanes (TTHM) and for haloacetic acids (HAA5) for each chlorination treatment facility identified in your individual disinfection byproducts (DBP) monitoring plan. Collect the samples from the distribution system at the frequency and locations identified in your DBP monitoring plan.

Chemical Sampling Requirements

- Source water chemical samples must be taken from a location as near to the source as possible, but after all treatment, and before entering the distribution system.
- Nitrate, nitrite and arsenic are included as part of a complete IOC.

Month	Source	Monitoring Requirement	Test Panel
January		*No source chemical sampling required this month*	

Water Quality Monitoring Report for the Year 2011

art 5: Regional Water Quality Monitoring Contact

Southwest Regional Office

or Further information call the Southwest Regional Office Sophia Petro Phone: (360) 236-3046

or questions regarding Disinfection ByProducts (DBP) monitoring, contact: Regina Grimm, p.e. (360) 236-3035

pecial Note

or Group A Community Systems Only: Your Consumer Confidence Report, summarizing the results of your 2010 ater quality monitoring requirements is due before July 1, 2011. For further information visit ww.doh.wa.gov/ehp/dw/Our_Main_Pages/consumer.htm or contact the CCR Coordinator at your Regional Office.

RAY HAYS
NORTH BONNEVILLE, CITY OF
PO BOX 7
NORTH BONNEVILLE WA 98639

Health
Division of Environmental Health
Office of Drinking Water

60150 L

Water Quality Monitoring Report for the Year 2011

Month	Source	Monitoring Requirement	Test Panel
ebruary		*No source chemical sampling required this month*	
arch		*No source chemical sampling required this month*	
pril		*No source chemical sampling required this month*	
ay		*No source chemical sampling required this month*	
ne		*No source chemical sampling required this month*	
ly		*No source chemical sampling required this month*	
ugust		HALO-ACETIC ACIDS	HAA5
ugust		TRIHALOMETHANES	THM
ugust	S01	NITRATE	NITRATE
eptember		*No source chemical sampling required this month*	
ctober		*No source chemical sampling required this month*	
ovember		*No source chemical sampling required this month*	
ecember		*No source chemical sampling required this month*	

art .. State Waivers

- Automatically granted to all sources based on DOH assessment of conditions within the state.
- No waiver application, or fee required.
- State waivers granted for the 2011 - 2013 compliance period are listed in Part 4.

art 4: Water Quality Monitoring Frequency

- Although waivers may be granted for your system, there may be some monitoring required as a condition of the waiver your system was granted.

Monitoring Group	Test Panel	Sample Location	Schedule/Status
Asbestos	ASB	Distribution	State Waiver Thru Dec 2019
Bacteriological	Coli	Distribution	See routine sample schedule in part 2
Dioxin	Dioxin	All sources	State Waiver Thru Dec 2013
Endothall	Endo	All sources	State Waiver Thru Dec 2013
EDB and other soil fumigants	Fumigant	S01	State Waiver Thru Dec 2013
Glyphosphate	Glyphs	All sources	State Waiver Thru Dec 2013
Halo-Acetic Acids	HAA5	Distribution	1 sample per treatment plant every 3 years
Herbicides	Herbs	S01	1 sample between Jan 2011 - Dec 2013
Insecticides	Insect	S01	1 sample between Jan 2011 - Dec 2013
Ino. .ic Contaminants	IOC	S01	1 sample between Jan 2011 - Dec 2013
Lead/Copper *	LCR	Distribution	LCR 1 Set of 10 samples between Jan 2010 - Dec 2012

Water Quality Monitoring Report for the Year 2011

Monitoring Group	Test Panel	Sample Location	Schedule/Status
trate *	NIT	S01	Collect 1 sample(s) every 1 year
General Pesticides	Pest1	S01	1 sample between Jan 2011 - Dec 2013
Diquat	Diquat	All sources	State Waiver Thru Dec 2013
Total Trihalomethane	THM	Distribution	1 sample per treatment plant every 3 years
Volatile Organic Contaminants	VOC	S01	1 sample between Jan 2011 - Dec 2013

** These contaminant monitoring groups do not have waiver options under the SDWA.*

Washington State Department of Health

Division of Environmental Health
Office of Drinking Water

Help

Individual System View

Compliance Actions | Operating Permits | Operators | Reports | Water Use Efficiency

General Information | Source Information | Samples | Exceedances

Type	Source	DOE Source	Collect Date5	Analyte	Result Quantity	Units	Test Panel	Analyte Group	Sample Number	Lab Number
MCL2	01	28G449	8/24/1981	MANGANESE	0.132	mg/L	ICHEM	IOC	04712	051
MCL2	01	28G449	5/21/1984	IRON	0.380	mg/L	ICHEM	IOC	07144	051
MCL2	01	28G449	5/21/1984	MANGANESE	0.325	mg/L	ICHEM	IOC	07144	051
MCL2	01	28G449	2/23/1987	MANGANESE	0.066	mg/L	ICHEM	IOC	09526	051
MCL2	01	28G449	12/27/1989	IRON	0.710	mg/L	ICHEM	IOC	12178	051
MCL2	01	28G449	12/27/1989	MANGANESE	0.261	mg/L	ICHEM	IOC	12178	051
MCL2	01	28G449	3/6/1995	MANGANESE	0.078	mg/L	IOC	IOC	00671	088
MCL2	01	28G449	2/15/2001	IRON	1.00	mg/L	IOC	IOC	10246	088
MCL2	01	28G449	2/15/2001	MANGANESE	0.300	mg/L	IOC	IOC	10246	088
P	Distribution		12/10/2001	TOTAL COLIFORM	Present	/100ml	COLI_AP	MICRO	05265	144

Records 1 - 10 of 10

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Department of Health, Office of Drinking Water

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243 Israel Road S.E. 2nd floor
Tumwater, WA 98501

Mail:
PO BOX 47822
Olympia, WA 98504-7822

Phone: (360) 236-3100

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APPENDIX E

HYDRAULIC MODELING RESULTS

2011 Calibration Results

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J-2	1.45	52	239.24	81.13
J-3	1.45	56	239.24	79.4
J-4	1.45	56	239.24	79.4
J-5	1.45	51	239.24	81.57
J-6	1.45	56	239.24	79.4
J-7	1.45	52	239.24	81.13
J-8	1.45	36	239.25	88.07
J-9	1.45	46	239.24	83.73
J-10	1.45	48	239.24	82.87
J-11	1.45	55	239.25	79.83
J-12	1.45	55	239.25	79.83
J-13	1.45	46	239.25	83.74
J-14	1.45	46	239.26	83.74
J-15	1.45	36	239.29	88.09
J-16	0	56	239.33	79.44
J-17	1.45	56	239.34	79.44
J-18	1.45	56	239.34	79.44
J-21	1.45	56	239.33	79.44
J-22	1.45	56	239.33	79.44
J-23	1.45	56	239.33	79.44
J-24	1.45	54	239.31	80.3
J-25	1.45	38	239.3	87.23
J-26	1.45	37	239.3	87.66
J-27	1.45	36	239.28	88.08
J-28	1.45	21	239.27	94.58
J-29	1.45	46	239.27	83.74
J-30	1.45	27	239.26	91.97
J-31	1.45	34	239.26	88.94
J-32	1.45	35	239.26	88.5
J-33	1.45	35	239.26	88.5
J-34	1.45	34	239.26	88.94
J-35	1.45	32	239.26	89.8
J-36	1.45	32	239.26	89.8
J-37	1.45	31	239.26	90.24
J-38	1.45	36	239.26	88.07
J-39	1.45	34	239.26	88.94
J-40	1.45	36	239.26	88.07
J-41	1.45	37	239.26	87.64
J-42	1.45	36	239.26	88.07
J-43	1.45	36	239.26	88.07
J-44	1.45	36	239.26	88.07
J-45	1.45	34	239.25	88.94
J-46	1.45	34	239.25	88.94
J-47	1.45	36	239.25	88.07

2011 Calibration Results

J-48	1.45	34	239.25	88.94
J-49	1.45	42	239.25	85.47
J-50	1.45	42	239.25	85.47
J-51	1.45	40	239.25	86.34
J-52	1.45	38	239.25	87.2
J-53	1.45	36	239.25	88.07
J-54	1.45	38	239.25	87.2
J-55	1.45	41	239.25	85.9
J-56	1.45	40	239.25	86.34
J-57	1.45	40	239.25	86.34
J-58	1.45	42	239.25	85.47
J-59	1.45	42	239.25	85.47
J-60	1.45	42	239.25	85.47
J-61	1.45	42	239.25	85.47
J-62	1.45	38	239.26	87.2
J-63	1.45	42	239.26	85.47
J-64	1.45	38	239.26	87.2
J-65	1.45	38	239.26	87.2
J-66	1.45	44	239.26	84.6
J-67	1.45	34	239.28	88.95
J-68	1.45	29	239.28	91.12
J-69	1.45	22	239.28	94.15
J-70	1.45	32	239.28	89.82
J-71	1.45	31	239.28	90.25
J-79	1.45	56	239.31	79.43
J-80	1.45	57	239.31	79
J-81	1.45	56	239.31	79.43
J-82	1.45	55	239.31	79.86
J-83	1.45	44	239.27	84.61
J-84	1.45	45	239.27	84.18
J-85	1.45	45	239.27	84.18
J-86	1.45	45	239.27	84.18
J-87	1.45	45	239.27	84.18
J-88	1.45	46	239.26	83.74
J-89	1.45	59	239.25	78.1
J-90	1.45	57	239.25	78.97
J-91	1.45	58	239.25	78.54
J-92	1.45	58	239.25	78.54
J-93	1.45	58	239.25	78.53
J-94	1.45	52	239.25	81.13
J-95	1.45	50	239.25	82
J-96	1.45	38	239.25	87.2
J-97	1.45	50	239.25	82
J-98	1.45	53	239.25	80.7
J-99	1.45	52	239.25	81.14

2017 Fire Flow Results

ID	Static Demand (gpm)	Static Pressure (psi)	Static Head (ft)	Fire-Flow Demand (gpm)	Residual Pressure (psi)	Available Flow at Hydrant	Available Flow Pressure
J-10	6.45	73.93	218.62	1,000.00	28.54	1,116.99	20
J-11	6.45	70.93	218.69	1,000.00	51.66	1,952.66	20
J-12	6.45	70.93	218.69	1,000.00	36.37	1,278.71	20
J-13	6.45	74.88	218.81	1,000.00	59.52	2,484.34	20
J-14	6.45	74.9	218.86	1,000.00	60.86	2,701.20	20
J-15	6.45	79.39	219.23	1,000.00	66.59	3,068.61	20
J-16	6.45	71.27	220.48	1,000.00	61.48	3,534.28	20
J-17	6.45	71.33	220.63	1,000.00	61.64	3,561.17	20
J-18	6.45	71.33	220.63	1,000.00	55.29	2,149.69	20
J-2	6.45	72.2	218.63	1,000.00	45.63	1,558.16	20
J-21	6.45	71.27	220.47	1,000.00	61.42	3,513.49	20
J-22	6.45	71.27	220.47	1,000.00	55.66	2,201.47	20
J-23	6.45	71.26	220.47	1,000.00	61.38	3,500.09	20
J-24	6.45	71.7	219.48	1,000.00	59.9	3,007.19	20
J-25	6.45	78.81	219.88	1,000.00	66.68	3,198.82	20
J-26	6.45	79.2	219.77	1,000.00	66.78	3,145.89	20
J-27	6.45	79.48	219.44	1,000.00	66.35	3,001.62	20
J-28	6.45	85.87	219.18	1,000.00	72.2	3,107.70	20
J-29	6.45	75.04	219.18	1,000.00	61.37	2,756.35	20
J-3	6.45	70.47	218.63	1,000.00	44.91	1,568.15	20
J-30	6.45	83.17	218.95	1,000.00	69.11	2,959.16	20
J-31	6.45	80.13	218.93	1,000.00	65.8	2,812.04	20
J-32	6.45	79.69	218.91	1,000.00	65	2,732.22	20
J-33	6.45	79.69	218.9	1,000.00	65.31	2,789.15	20
J-34	6.45	80.12	218.9	1,000.00	65.62	2,777.60	20
J-35	6.45	80.98	218.88	1,000.00	66.38	2,784.67	20
J-36	6.45	80.98	218.88	1,000.00	60.78	2,077.30	20
J-37	6.45	81.41	218.88	1,000.00	66.95	2,827.52	20
J-38	6.45	79.24	218.88	1,000.00	64.34	2,673.90	20
J-39	6.45	80.1	218.87	1,000.00	64.85	2,650.86	20
J-4	6.45	70.47	218.63	1,000.00	44.51	1,550.68	20
J-40	6.45	79.24	218.87	1,000.00	63.87	2,606.20	20
J-41	6.45	78.8	218.87	1,000.00	52.62	1,676.42	20
J-42	6.45	79.23	218.86	1,000.00	60.23	2,153.60	20
J-43	6.45	79.23	218.86	1,000.00	60.08	2,138.84	20
J-44	6.45	79.23	218.86	1,000.00	58.35	1,994.07	20
J-45	6.45	80.09	218.85	1,000.00	64.47	2,588.98	20
J-46	6.45	80.09	218.83	1,000.00	61.44	2,209.88	20
J-47	6.45	79.22	218.83	1,000.00	57.91	1,963.62	20
J-48	6.45	80.08	218.82	1,000.00	59.11	2,008.52	20
J-49	6.45	76.62	218.82	1,000.00	56.33	1,986.91	20
J-5	6.45	72.63	218.63	1,000.00	46.14	1,569.20	20
J-50	6.45	76.61	218.81	1,000.00	21.43	1,021.71	20

2017 Fire Flow Results

J-51	6.45	77.49	218.83	1,000.00	62.04	2,544.61	20
J-52	6.45	78.35	218.82	1,000.00	60.43	2,242.00	20
J-53	6.45	79.21	218.82	1,000.00	37.33	1,238.32	20
J-54	6.45	78.35	218.82	1,000.00	57.93	2,011.23	20
J-55	6.45	77.05	218.83	1,000.00	61.79	2,561.90	20
J-56	6.45	77.48	218.82	1,000.00	59.25	2,191.10	20
J-57	6.45	77.48	218.81	1,000.00	25.84	1,072.08	20
J-58	6.45	76.62	218.83	1,000.00	61.64	2,594.12	20
J-59	6.45	76.62	218.82	1,000.00	53.83	1,815.30	20
J-6	6.45	70.47	218.63	1,000.00	44.41	1,546.74	20
J-60	6.45	76.61	218.82	1,000.00	47.95	1,541.39	20
J-61	6.45	76.61	218.81	1,000.00	24.55	1,057.47	20
J-62	6.45	78.36	218.85	1,000.00	64.11	2,781.98	20
J-63	6.45	76.63	218.84	1,000.00	61.66	2,595.42	20
J-64	6.45	78.36	218.85	1,000.00	64.03	2,762.07	20
J-65	6.45	78.36	218.85	1,000.00	56.43	1,896.94	20
J-66	6.45	75.76	218.85	1,000.00	61.56	2,703.11	20
J-67	6.45	80.35	219.43	1,000.00	65.36	2,644.57	20
J-68	6.45	82.52	219.43	1,000.00	68.88	2,981.61	20
J-69	6.45	85.55	219.43	1,000.00	67.06	2,314.45	20
J-7	6.45	72.2	218.63	1,000.00	44.41	1,509.20	20
J-70	6.45	81.22	219.43	1,000.00	67.25	2,868.67	20
J-71	6.45	81.65	219.43	1,000.00	66.67	2,685.14	20
J-79	6.45	70.85	219.52	1,000.00	59.32	3,043.77	20
J-8	6.45	79.14	218.65	1,000.00	55.86	1,856.13	20
J-80	6.45	70.42	219.51	1,000.00	58.64	2,953.02	20
J-81	6.45	70.84	219.5	1,000.00	58.78	2,891.04	20
J-82	6.45	71.27	219.48	1,000.00	59.52	3,009.04	20
J-83	6.45	75.83	219	1,000.00	62.24	2,800.44	20
J-84	6.45	75.39	218.99	1,000.00	61.58	2,739.88	20
J-85	6.45	75.39	218.99	1,000.00	60.17	2,484.00	20
J-86	6.45	75.38	218.98	1,000.00	61.22	2,667.87	20
J-87	6.45	75.37	218.94	1,000.00	61.07	2,644.51	20
J-88	6.45	74.93	218.93	1,000.00	61.12	2,734.53	20
J-89	6.45	69.21	218.73	1,000.00	51.7	2,064.13	20
J-9	6.45	74.8	218.62	1,000.00	40.95	1,359.74	20
J-90	6.45	70.07	218.71	1,000.00	52.12	2,046.36	20
J-91	6.45	69.64	218.71	1,000.00	51.31	1,999.30	20
J-92	6.45	69.64	218.71	1,000.00	51.18	1,987.08	20
J-93	6.45	69.63	218.7	1,000.00	37.23	1,313.32	20
J-94	6.45	72.23	218.69	1,000.00	35.16	1,242.23	20
J-95	6.45	73.09	218.69	1,000.00	20.43	1,011.35	20
J-96	6.45	78.35	218.82	1,000.00	60.4	2,240.04	20
J-97	6.45	73.15	218.83	1,000.00	56.61	2,265.03	20
J-98	6.45	71.85	218.83	1,000.00	54.89	2,179.52	20
J-99	6.45	72.29	218.83	1,000.00	55.1	2,165.41	20

2017 Peak Hour Demand Results

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J-2	12.83	52	224.56	74.77
J-3	12.83	56	224.58	73.04
J-4	12.83	56	224.57	73.04
J-5	12.83	51	224.57	75.21
J-6	12.83	56	224.57	73.04
J-7	12.83	52	224.56	74.77
J-8	12.83	36	224.65	81.74
J-9	12.83	46	224.54	77.36
J-10	12.83	48	224.53	76.49
J-11	12.83	55	224.8	73.57
J-12	12.83	55	224.79	73.57
J-13	12.83	46	225.2	77.65
J-14	12.83	46	225.38	77.73
J-15	12.83	36	227.2	82.85
J-16	12.83	56	229.7	75.26
J-17	12.83	56	229.77	75.3
J-18	12.83	56	229.77	75.29
J-21	12.83	56	229.67	75.25
J-22	12.83	56	229.66	75.25
J-23	12.83	56	229.65	75.24
J-24	12.83	54	228.37	75.55
J-25	12.83	38	228.01	82.33
J-26	12.83	37	227.69	82.63
J-27	12.83	36	226.76	82.65
J-28	12.83	21	226.07	88.86
J-29	12.83	46	226.07	78.02
J-30	12.83	27	225.46	85.99
J-31	12.83	34	225.42	82.94
J-32	12.83	35	225.35	82.48
J-33	12.83	35	225.36	82.48
J-34	12.83	34	225.34	82.91
J-35	12.83	32	225.31	83.76
J-36	12.83	32	225.31	83.76
J-37	12.83	31	225.29	84.19
J-38	12.83	36	225.3	82.02
J-39	12.83	34	225.24	82.86
J-40	12.83	36	225.23	82
J-41	12.83	37	225.23	81.56
J-42	12.83	36	225.22	81.99
J-43	12.83	36	225.22	81.99
J-44	12.83	36	225.21	81.99
J-45	12.83	34	225.18	82.84
J-46	12.83	34	225.13	82.82
J-47	12.83	36	225.13	81.95

2017 Peak Hour Demand Results

J-48	12.83	34	225.11	82.81
J-49	12.83	42	225.11	79.34
J-50	12.83	42	225.08	79.33
J-51	12.83	40	225.15	80.23
J-52	12.83	38	225.14	81.09
J-53	12.83	36	225.12	81.95
J-54	12.83	38	225.14	81.09
J-55	12.83	41	225.15	79.79
J-56	12.83	40	225.12	80.21
J-57	12.83	40	225.09	80.2
J-58	12.83	42	225.18	79.37
J-59	12.83	42	225.14	79.35
J-60	12.83	42	225.12	79.35
J-61	12.83	42	225.1	79.34
J-62	12.83	38	225.24	81.13
J-63	12.83	42	225.22	79.39
J-64	12.83	38	225.25	81.14
J-65	12.83	38	225.25	81.13
J-66	12.83	44	225.28	78.55
J-67	12.83	34	226.75	83.52
J-68	12.83	29	226.75	85.69
J-69	12.83	22	226.75	88.72
J-70	12.83	32	226.75	84.38
J-71	12.83	31	226.75	84.82
J-79	12.83	56	228.56	74.77
J-80	12.83	57	228.54	74.33
J-81	12.83	56	228.48	74.73
J-82	12.83	55	228.36	75.12
J-83	12.83	44	226.08	78.89
J-84	12.83	45	226.05	78.45
J-85	12.83	45	226.05	78.45
J-86	12.83	45	225.99	78.43
J-87	12.83	45	225.8	78.34
J-88	12.83	46	225.73	77.88
J-89	12.83	59	224.92	71.89
J-90	12.83	57	224.87	72.74
J-91	12.83	58	224.87	72.3
J-92	12.83	58	224.87	72.3
J-93	12.83	58	224.81	72.28
J-94	12.83	52	224.79	74.87
J-95	12.83	50	224.78	75.73
J-96	12.83	38	225.14	81.09
J-97	12.83	50	225.17	75.9
J-98	12.83	53	225.16	74.6
J-99	12.83	52	225.16	75.03

2032 Fire Flow Results

ID	Static Demand (gpm)	Static Pressure (psi)	Static Head (ft)	Fire-Flow Demand (gpm)	Residual Pressure (psi)	Available Flow at Hydrant (gpm)	Available Flow Pressure (psi)
J-2	11.71	64.91	201.8	1,000.00	34.11	1,309.93	20
J-3	11.71	63.18	201.81	1,000.00	33.43	1,308.66	20
J-4	11.71	63.18	201.8	1,000.00	33.01	1,295.14	20
J-5	11.71	65.34	201.8	1,000.00	34.63	1,321.03	20
J-6	11.71	63.18	201.8	1,000.00	32.91	1,292.15	20
J-7	11.71	64.91	201.79	1,000.00	32.85	1,272.13	20
J-8	11.71	71.87	201.87	1,000.00	44.55	1,579.88	20
J-9	11.71	67.5	201.78	1,000.00	29.28	1,166.70	20
J-10	11.71	66.63	201.77	1,000.00	16.75	969.73	20
J-11	11.71	63.69	202	1,000.00	40.69	1,611.16	20
J-12	11.71	63.69	201.99	1,000.00	25.25	1,098.88	20
J-13	11.71	67.74	202.33	1,000.00	49.12	2,056.62	20
J-14	11.71	67.81	202.49	1,000.00	50.69	2,227.26	20
J-15	11.71	72.73	203.85	1,000.00	57.11	2,593.18	20
J-16	11.71	65.28	206.65	1,000.00	53.66	2,979.67	20
J-17	11.71	65.38	206.88	1,000.00	53.87	3,005.98	20
J-18	11.71	65.38	206.88	1,000.00	47.46	1,898.01	20
J-21	11.71	65.26	206.62	1,000.00	53.58	2,961.73	20
J-22	11.71	65.26	206.62	1,000.00	47.76	1,936.98	20
J-23	11.71	65.26	206.6	1,000.00	53.53	2,950.05	20
J-24	11.71	65.31	204.73	1,000.00	51.05	2,508.89	20
J-25	11.71	72.39	205.07	1,000.00	57.62	2,713.31	20
J-26	11.71	72.7	204.77	1,000.00	57.55	2,666.12	20
J-27	11.71	72.75	203.89	1,000.00	56.68	2,531.49	20
J-28	11.71	78.96	203.23	1,000.00	62.26	2,645.26	20
J-29	11.71	68.13	203.23	1,000.00	51.43	2,286.98	20
J-30	11.71	76.11	202.64	1,000.00	58.93	2,492.34	20
J-31	11.71	73.06	202.6	1,000.00	55.57	2,354.11	20
J-32	11.71	72.6	202.55	1,000.00	54.71	2,287.81	20
J-33	11.71	72.6	202.54	1,000.00	55.09	2,332.24	20
J-34	11.71	73.02	202.52	1,000.00	55.38	2,327.21	20
J-35	11.71	73.87	202.49	1,000.00	56.14	2,339.51	20
J-36	11.71	73.87	202.49	1,000.00	50.49	1,798.11	20
J-37	11.71	74.3	202.47	1,000.00	56.7	2,374.31	20
J-38	11.71	72.14	202.48	1,000.00	54.1	2,243.12	20
J-39	11.71	72.98	202.44	1,000.00	54.49	2,225.74	20
J-40	11.71	72.12	202.44	1,000.00	53.5	2,185.31	20
J-41	11.71	71.68	202.43	1,000.00	42.15	1,462.96	20
J-42	11.71	72.11	202.42	1,000.00	49.76	1,839.86	20
J-43	11.71	72.11	202.42	1,000.00	49.6	1,828.46	20
J-44	11.71	72.11	202.42	1,000.00	47.85	1,715.78	20
J-45	11.71	72.96	202.38	1,000.00	54.07	2,177.94	20
J-46	11.71	72.94	202.34	1,000.00	50.93	1,886.60	20

2032 Fire Flow Results

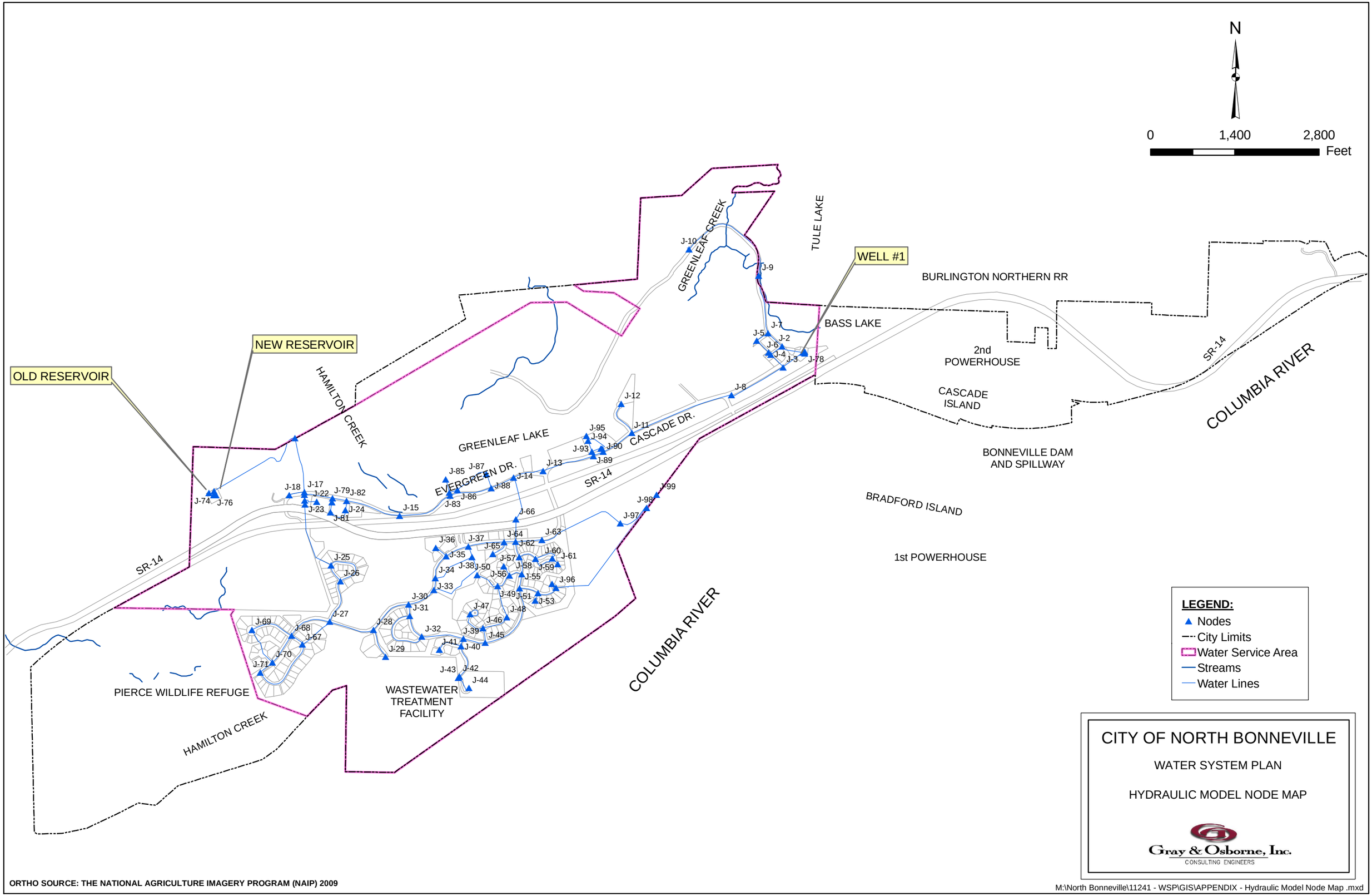
J-47	11.71	72.07	202.34	1,000.00	47.37	1,690.34	20
J-48	11.71	72.93	202.32	1,000.00	48.54	1,728.68	20
J-49	11.71	69.46	202.31	1,000.00	45.73	1,691.36	20
J-50	11.71	69.45	202.29	1,000.00	10.5	909.87	20
J-51	11.71	70.35	202.35	1,000.00	51.63	2,123.05	20
J-52	11.71	71.21	202.33	1,000.00	49.95	1,901.48	20
J-53	11.71	72.07	202.32	1,000.00	26.62	1,100.55	20
J-54	11.71	71.21	202.33	1,000.00	47.42	1,723.76	20
J-55	11.71	69.91	202.35	1,000.00	51.38	2,131.87	20
J-56	11.71	70.33	202.32	1,000.00	48.72	1,854.35	20
J-57	11.71	70.32	202.3	1,000.00	14.98	955.01	20
J-58	11.71	69.49	202.36	1,000.00	51.27	2,153.62	20
J-59	11.71	69.47	202.33	1,000.00	43.23	1,558.82	20
J-60	11.71	69.47	202.32	1,000.00	37.24	1,339.39	20
J-61	11.71	69.46	202.3	1,000.00	13.61	939.72	20
J-62	11.71	71.24	202.41	1,000.00	53.81	2,310.10	20
J-63	11.71	69.5	202.4	1,000.00	51.32	2,156.42	20
J-64	11.71	71.25	202.43	1,000.00	53.74	2,296.67	20
J-65	11.71	71.24	202.42	1,000.00	46.07	1,640.16	20
J-66	11.71	68.65	202.44	1,000.00	51.3	2,231.30	20
J-67	11.71	73.61	203.89	1,000.00	55.66	2,266.61	20
J-68	11.71	75.78	203.89	1,000.00	59.19	2,541.48	20
J-69	11.71	78.81	203.88	1,000.00	57.33	2,035.03	20
J-70	11.71	74.48	203.89	1,000.00	57.56	2,444.51	20
J-71	11.71	74.91	203.89	1,000.00	56.97	2,306.77	20
J-79	11.71	64.51	204.88	1,000.00	50.59	2,532.98	20
J-80	11.71	64.07	204.86	1,000.00	49.89	2,461.06	20
J-81	11.71	64.48	204.81	1,000.00	50.01	2,419.12	20
J-82	11.71	64.88	204.72	1,000.00	50.66	2,504.40	20
J-83	11.71	68.9	203	1,000.00	52.33	2,328.23	20
J-84	11.71	68.45	202.98	1,000.00	51.66	2,278.23	20
J-85	11.71	68.45	202.98	1,000.00	50.24	2,089.77	20
J-86	11.71	68.44	202.94	1,000.00	51.29	2,224.91	20
J-87	11.71	68.37	202.8	1,000.00	51.08	2,204.83	20
J-88	11.71	67.92	202.75	1,000.00	51.08	2,261.80	20
J-89	11.71	62.01	202.1	1,000.00	40.93	1,685.71	20
J-90	11.71	62.85	202.06	1,000.00	41.29	1,677.39	20
J-91	11.71	62.42	202.06	1,000.00	40.47	1,639.37	20
J-92	11.71	62.42	202.06	1,000.00	40.33	1,630.44	20
J-93	11.71	62.4	202	1,000.00	26.06	1,119.14	20
J-94	11.71	64.99	201.99	1,000.00	23.86	1,071.62	20
J-95	11.71	65.85	201.98	1,000.00	8.99	886.37	20
J-96	11.71	71.21	202.34	1,000.00	49.92	1,899.64	20
J-97	11.71	66.02	202.36	1,000.00	46.19	1,881.47	20
J-98	11.71	64.71	202.35	1,000.00	44.44	1,807.19	20
J-99	11.71	65.15	202.35	1,000.00	44.65	1,800.44	20

2032 Peak Hour Demand Results

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J-2	23.29	52	193.13	61.15
J-3	23.29	56	193.17	59.43
J-4	23.29	56	193.15	59.43
J-5	23.29	51	193.14	61.59
J-6	23.29	56	193.14	59.42
J-7	23.29	52	193.11	61.14
J-8	23.29	36	193.38	68.19
J-9	23.29	46	193.06	63.72
J-10	23.29	48	193.04	62.85
J-11	23.29	55	193.85	60.16
J-12	23.29	55	193.81	60.15
J-13	23.29	46	195.04	64.58
J-14	23.29	46	195.59	64.82
J-15	23.29	36	201.1	71.54
J-16	23.29	56	208.62	66.13
J-17	23.29	56	208.85	66.23
J-18	23.29	56	208.84	66.22
J-21	23.29	56	208.53	66.09
J-22	23.29	56	208.52	66.09
J-23	23.29	56	208.48	66.07
J-24	23.29	54	204.61	65.26
J-25	23.29	38	203.53	71.72
J-26	23.29	37	202.57	71.74
J-27	23.29	36	199.75	70.95
J-28	23.29	21	197.66	76.55
J-29	23.29	46	197.66	65.72
J-30	23.29	27	195.83	73.15
J-31	23.29	34	195.7	70.06
J-32	23.29	35	195.51	69.55
J-33	23.29	35	195.53	69.56
J-34	23.29	34	195.47	69.97
J-35	23.29	32	195.38	70.79
J-36	23.29	32	195.37	70.79
J-37	23.29	31	195.34	71.21
J-38	23.29	36	195.36	69.05
J-39	23.29	34	195.16	69.83
J-40	23.29	36	195.16	68.96
J-41	23.29	37	195.13	68.52
J-42	23.29	36	195.1	68.94
J-43	23.29	36	195.1	68.94
J-44	23.29	36	195.09	68.93
J-45	23.29	34	194.99	69.76
J-46	23.29	34	194.84	69.69
J-47	23.29	36	194.84	68.82

2032 Peak Hour Demand Results

J-48	23.29	34	194.78	69.67
J-49	23.29	42	194.77	66.2
J-50	23.29	42	194.7	66.16
J-51	23.29	40	194.91	67.12
J-52	23.29	38	194.87	67.97
J-53	23.29	36	194.82	68.82
J-54	23.29	38	194.87	67.97
J-55	23.29	41	194.91	66.69
J-56	23.29	40	194.8	67.08
J-57	23.29	40	194.73	67.04
J-58	23.29	42	194.98	66.29
J-59	23.29	42	194.86	66.23
J-60	23.29	42	194.81	66.21
J-61	23.29	42	194.76	66.19
J-62	23.29	38	195.18	68.11
J-63	23.29	42	195.12	66.35
J-64	23.29	38	195.21	68.12
J-65	23.29	38	195.19	68.11
J-66	23.29	44	195.3	65.56
J-67	23.29	34	199.72	71.81
J-68	23.29	29	199.73	73.98
J-69	23.29	22	199.71	77
J-70	23.29	32	199.72	72.67
J-71	23.29	31	199.72	73.11
J-79	23.29	56	205.2	64.65
J-80	23.29	57	205.12	64.18
J-81	23.29	56	204.94	64.54
J-82	23.29	55	204.59	64.82
J-83	23.29	44	197.7	66.6
J-84	23.29	45	197.61	66.13
J-85	23.29	45	197.61	66.13
J-86	23.29	45	197.45	66.06
J-87	23.29	45	196.85	65.8
J-88	23.29	46	196.66	65.28
J-89	23.29	59	194.21	58.59
J-90	23.29	57	194.06	59.39
J-91	23.29	58	194.05	58.95
J-92	23.29	58	194.04	58.95
J-93	23.29	58	193.86	58.87
J-94	23.29	52	193.82	61.45
J-95	23.29	50	193.79	62.3
J-96	23.29	38	194.88	67.98
J-97	23.29	50	194.97	62.81
J-98	23.29	53	194.93	61.5
J-99	23.29	52	194.93	61.93



ORTHO SOURCE: THE NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) 2009

M:\North Bonneville\11241 - WSP\GIS\APPENDIX - Hydraulic Model Node Map .mxd

APPENDIX F

SUSCEPTIBILITY ASSESSMENT

Ground Water Contamination
Susceptibility Assessment Survey Form
Version 2.1

IMPORTANT! Please complete one form for each ground water source (well, wellfield, spring) used in your water system. Photocopy as necessary.

PART I: System Information

Well owner/manager : City of N. Bonneville

Water system name : North Bonneville

County: Skamania

Water system number: ~~[illegible]~~ 40847 Source number: SO1

Well depth: 180 (ft.) (*From WFI form*)

Source name: WELL #1

WA well identification tag number: BOL-50L

_____ well not tagged

Number of connections: 172 Population served: 478

Township: 02N Range: 07E

Section: 21 1/4 1/4 Section: NE/NW

Latitude/longitude (if available): N/A /

How was lat./long. determined?

_____ global positioning device _____ survey _____ topographic map
_____other:

* Please refer to Assistance Packet for details and explanations of all questions in Parts II through V.

PART II: Well Construction and Source Information

1) Date well originally constructed: 11/21/75 month/day/year

last reconstruction: __/__/__ month/day/year

_____ information unavailable

2) Well driller: U.S. Army Corps of Engineers Portland, Oregon District

__ well driller unknown

3) Type of well:

__Drilled: __ rotary __ bored X cable (percussion) __ Dug

__ Other: __ spring(s) __ lateral collector (Ranney)

__ driven __ jetted __ other: _____

Additional comments: Drilled with cable Tool Churn Drill Rig

4) Well report available? X YES (attach copy to form) __ NO

If no well log is available, please attach any other records documenting well construction; e.g. boring logs, "as built" sheets, engineering reports, well reconstruction logs.

5) Average pumping rate: 625 gpm (gallons/min)

Source of information: 1994 WEI Report

If not documented, how was pumping rate determined? _____

__ Pumping rate unknown

6) Is this source treated?

If so, what type of treatment:

X disinfection __ filtration __ carbon filter __ air stripper __ other

Purpose of treatment (describe materials to be removed or controlled by treatment):

Water Bacteriological Analysis

7) If source is chlorinated, is a chlorine residual maintained: X YES __ NO

Residual level: 0.4 (*At the point closest to the source.*)

PART III: Hydrogeologic Information

1) Depth to top of open interval: [check one]

___ < 20 ft ___ 20-50 ft ___ 50-100 ft X 100-200 ft ___ >200 ft

___ information unavailable ('<' *means less than;* '>' *means greater than*)

2) Depth to ground water (static water level):

___ < 20 ft X 20-50 ft ___ 50-100 ft ___ > 100 ft

___ flowing well/spring (artesian)

How was water level determined?

X well log ___ other: _____

___ depth to ground water unknown

3) If source is a flowing well or spring, what is the confining pressure: N/A

_____ psi (pounds per square inch)
or
_____ feet above wellhead

4) If source is a flowing well or spring, is there a surface impoundment, reservoir, or catchment associated with this source: ___ YES ___ NO

5) Wellhead elevation (height above mean sea level): 644.7 (ft)

How was elevation determined? ___ topographic map X Drilling/Well Log ___ altimeter

___ other: _____

___ information unavailable

6) Confining layers: (This can be completed only for those sources with a drilling log, well log or geologic report describing subsurface conditions. Please refer to assistance package for example.)

X evidence of a confining layer in well log

___ no evidence of a confining layer in well log

If there is evidence of a confining layer, is the depth to ground water more than 20 feet above the top of the open interval? X YES ___ NO

___ information unavailable

Please Review well Log for your determining I am not a Geologist

7) Sanitary setback:

___ < 100 ft* X 100-120 ft ___ 120-200 ft ___ > 200 ft
* if less than 100 ft describe the site conditions:

8) Wellhead construction:

X wellhead enclosed in a wellhouse

___ controlled access (describe): Locked Building

___ other uses for wellhouse (describe): None

___ no wellhead control

9) Surface seal:

___ 18 ft

___ < 18 ft (no Department of Ecology approval) ('<' *means less than*)

___ < 18 ft (Approved by Ecology, include documentation) ('<' *means less than*)

X > 18 ft ('>' *means greater than*)

___ depth of seal unknown

___ no surface seal

10) Annual rainfall (inches per year):

___ < 10 in/yr ___ 10-25 in/yr X > 25 in/yr

PART IV: Mapping Your Ground Water Resource

1) Annual volume of water pumped: 56m (gallons)

How was this determined?

X meter

___ estimated: ___ pumping rate (_____)

___ pump capacity (_____)

___ other: _____

2) "Calculated Fixed Radius" estimate of ground water movement:
(see Instruction Packet)

6 month ground water travel time : 310 (ft)

1 year ground water travel time : 440 (ft)

5 year ground water travel time: 980 (ft)

10 year ground water travel time: 1,390 (ft)

Information available on length of screened/open interval?

X YES ___ NO

Length of screened/open interval: 40 ? (ft)

3) Is there a river, lake, pond, stream, or other obvious surface water body within the 6 month time of travel boundary? ___ YES X NO (mark and identify on map).

4) Is there a stormwater and/or wastewater facility, treatment lagoon, or holding pond located within the 6 month time of travel boundary? ___ YES X NO (mark and identify on map).

Comments: _____

PART V: Assessment of Water Quality

1) Regional sources of risk to ground water:

Please indicate if any of the following are present within a circular area around your water source having a radius up to and including the five year ground water travel time:

	6 month	1 year	5 year	unknown
likely pesticide application	___	___	___	___
stormwater injection wells	___	___	___	___
other injection wells	___	___	___	___
abandoned ground water well	___	___	___	___
landfills, dumps, disposal areas	___	___	___	___
known hazardous materials clean-up site	___	___	___	___
water system(s) with known quality problems	___	___	___	___
population density > 1 house/acre	___	___	___	___
residences commonly have septic tanks	(1)	___	___	___
Wastewater treatment lagoons	___	___	___	___
sites used for land application of waste	___	___	___	___

Mark and identify on map any of the risks listed above which are located within the 6 month time of travel boundary? (*Please include a map of the wellhead and time of travel areas with this form. Please locate and mark any of the following.*)

If other recorded or potential sources of ground water contamination exist within the ten year time of travel circular zone around your water supply, please describe:

There is one House with a septic Tank within The given Radius. At This Time Two Letters have been sent To The Owner To hook up To The City Sewer System

2) Source specific water quality records:

Please indicate the occurrence of any test results since 1986 that meet the following conditions: (Unless listed on assessment, MCLs are listed in assistance package.)

A. Nitrate: (Nitrate MCL = 10 mg/l)	YES	NO
Results greater than MCL	___	X
< 2 mg/liter nitrate	___	___
2-5 mg/liter nitrate	___	___
> 5 mg/liter nitrate	___	___
___ Nitrate sampling records unavailable		

B. VOCs: (VOC detection level 0.5 ug/l or 0.0005 mg/l.)	YES	NO
Results greater than MCL or SAL	___	___
VOCs detected at least once	___	___
VOCs never detected	___	___
X VOC sampling records unavailable		

C. EDB/DBCP:	YES	NO
(EDB MCL = 0.05 ug/l or 0.00005 mg/l. DBCP MCL = 0.2 ug/l or 0.0002 mg/l.)		
EDB/DBCP detected below MCL at least once	___	___
EDB/DBCP detected above MCL at least once	___	___
EDB/DBCP never detected	___	___
___ EDB/DBCP tests required but not yet completed		
X EDB/DBCP tests not required		

D. Other SOCs (Pesticides):	YES	NO
Other SOCs detected	___	X
(pesticides and other synthetic organic chemicals)		
___ Other SOC tests performed but none detected (list test methods in comments		
___ Other SOC tests not performed		

If any SOCs in addition to EDB/DBCP were detected, please identify and date. If other SOC tests were performed, but no SOCs detected, list test methods here: Attached

E. Bacterial contamination:

	YES	NO
Any bacterial detection(s) in the past 3 years in samples taken from the source (not distribution sampling records).	___	X
Has source (in past 3 years) had a bacteriological contamination problem found in distribution samples that was attributed to the source.	___	X

___ Source sampling records for bacteria unavailable

Part VI: Geographic or Hydrologic Factors Contributing to a Non-Circular Zone of Contribution

The following questions will help identify those ground water systems which may not be accurately represented by the calculated fixed radius (CFR) method described in Part IV. For these sources, the CFR areas should be used as a preliminary delineation of the critical time of travel zones for that source. As a system develops its Wellhead Protection Plan for theses sources, a more detailed delineation method should be considered.

1) Is there evidence of obvious hydrologic boundaries within the 10 year time of travel zone of the CFR? (Does the largest circle extend over a stream, river, lake, up a steep hillside, and/or over a mountain or ridge?)

X YES ___ NO

Describe with references to map produced in Part IV:

Columbia River, Greenleaf Lake, Bass Lake, Moffet Creek

2) Aquifer Material:

A) Does the drilling log, well log or other geologic/engineering reports identify that the well is located in an area where the underground conditions are identified as fractured rock and/or basalt terrain?

___ YES X NO

B) Does the drilling log, well log or other geologic/engineering reports indicate that the well is located in an area where the underground conditions are primarily identified as coarse sand and gravel?

X YES ___ NO

3) Is the source located in an aquifer with a high horizontal flow rate? (These can include sources located on flood plains of large rivers, artesian wells with high water pressure, and/or shallow flowing wells and springs.)

__ YES X NO ?

4) Are there other high capacity wells (agricultural, municipal and/or industrial) located within the CFRs?

a) Presence of ground water extraction wells removing more than approximately 500 gal/min within...

	YES	NO	unknown
< 6 month travel time	__	X	__
6 month–1 year travel time	__	__	__
1–5 year travel time	__	__	__
5–10 year travel time	__	__	__

b) Presence of ground water recharge wells (dry wells) or heavy irrigation within...

	YES	NO	unknown
< 1 year travel time	__	X	__
1–5 year travel time	__	__	__
5–10 year travel time	__	__	__

Please identify or describe additional hydrologic or geographic conditions that you believe may affect the shape of the zone of contribution for this source. Where possible, reference them to locations on the map produced in Part IV.

The PSA aquifer we pump out of runs North to South under the Columbia River. The Fish Hatchery at The Bonneville Dam also pumps from The same aquifer on the Oregon side of The Columbia.

Suggestions and Comments

Did you attend one of the susceptibility workshops? ___ YES X NO

Did you find it useful? ___ YES ___ NO

Did you seek outside assistance to complete the assessment? ___ YES ___ NO

This form and instruction packet are still in the process of development. Your comments, suggestions and questions will help us upgrade and improve this assessment form. If you found particular sections confusing or problematic please let us know. How could this susceptibility assessment be improved or made clearer? Did the instruction package help you find the information needed to complete the assessment? How much time did it take you to complete the form? Were you able to complete the assessment without additional/outside expertise? Do you feel the assessment was valuable as a learning experience? Any other comments or constructive criticisms you have would be appreciated.

I completed this information to the best of my knowledge [illegible] Report [illegible] contaminants [illegible] when the [illegible]

APPENDIX G

WELLHEAD PROTECTION NOTIFICATION LETTER

CITY OF NORTH BONNEVILLE

P. O. BOX 7, NORTH BONNEVILLE, WASHINGTON 98639

TELEPHONE (509) 427-8182

Dear (Agency/Local Government):
As part of the wellhead protection program for the City of North Bonneville, we are hereby informing you of the findings of our wellhead protection area delineation. This is in accordance with State regulations (WAC 246-290-135).

Our City has 344 service connections, and serves a population of approximately 1000 people. The State Department of Health has given our system a rating of *(Note: The city has a completed a Ground Water Contamination Susceptibility Assessment Survey but has not received a rating from DOH; or at least it is not in the WSP).*

The enclosed map shows the 1, 5, and 10-year time of travel boundaries for our wellhead protection area. Any ground water contamination that occurs within this wellhead protection area has a _____ potential to reach our well. It is therefore of utmost importance to us that all reasonable steps be taken to ensure that land use activities within this area do not contaminate our customers' drinking water supplies.

Thank you for your support in protecting our drinking water.

Sincerely,

Don Stevens
Mayor

CITY OF NORTH BONNEVILLE

P. O. BOX 7, NORTH BONNEVILLE, WASHINGTON 98639

TELEPHONE (509) 427-8182

Dear (Owner/Operator):
In order to protect the drinking water supply for the customers of the City of North Bonneville, we are developing a wellhead protection program in accordance with State requirements. As part of our wellhead protection program, we mapped the area overlying the short-term recharge zone of our drinking water supply wells. This is called our wellhead protection area.

Following the mapping of the wellhead protection area, we conducted an inventory of **potential** sources of ground water contamination within the area. The nature of your business and its location within our wellhead protection area means that your activities have the potential to affect our customers' drinking water supply.

We have notified the regulatory agency(ies) that regulates you type of business/facility of you presence within our wellhead protection area. You should contact them to request technical assistance to help manage you business in a way that will best prevent ground water contamination. We realize you are already careful to protect the environment as you conduct your business. We hope that informing you of your location in our wellhead protection area will result in an increase in precautions to ensure that your activities will not impact our drinking water quality.

Sincerely,

Don Stevens
Mayor

Appendix E: Key Contacts

State Agencies

Washington State Department of Health <http://www.wa.gov/ehp/dw> Wellhead Protection Program

Headquarters
PO Box 47822
Olympia, WA 98504-7822
(360) 236-3100

Eastern Regional Office
16201 E. Indiana Ave., Suite 1500
Spokane Valley, WA 99216
(509) 329-2100

Northwest Regional Office
20435 72nd Avenue South, Suite 200
Kent, WA 98032
(253) 395-6750

Southwest Regional Office
PO Box 47823
Olympia, WA 98504-7823
360-236-3030

Washington State Department of Ecology <http://www.ecy.wa.gov/>

Hazardous Waste and Toxics Reduction Program
PO Box 47600
Olympia, WA 98504-7600
(360) 407-6700

Hazardous Waste Clean-up Sites
(800) 826-7716

Water Resources Program/Well Identification
PO Box 47600
Olympia, WA 98504-7600
(360) 407-6648

Water Quality Program
PO Box 47600
Olympia, WA 98504-7600
(360) 407-6600

Central Regional Office
15 West Yakima Avenue, Suite 200
Yakima, WA 98902
(509) 575-2490

Eastern Regional Office
N 4601 Monroe St
Spokane, WA 99205-1295
(509) 329-3400

Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5452
(425) 649-7000

Southwest Regional Office
300 Desmond Drive
Lacey, WA 98503
(360) 407-6300

Municipal Research and Services Center
<http://www.mrsc.org/>
2601 4th Avenue, Suite 800
Seattle, WA 98121-1280
(206) 625-1300

Department of Agriculture
<http://www.agr.wa.gov/>
Pesticide Management Division
PO Box 42589
Olympia, WA 98504-2589
(877) 301-4555

Department of Commerce
<http://www.commerce.wa.gov>
Growth Management Services
PO Box 42525
Olympia, WA 98504-2525
(360) 725-3000

Department of Commerce
Public Works Board
<http://www.pwb.wa.gov/>
PO Box 42525
Olympia, WA 98504-2525
(360) 725-3150

Washington State University - Extension <http://ext.wsu.edu/>

Agriculture & Natural Resource Program
P. O. Box 646248
Pullman, WA 99164-6248
(509) 335-8744

Federal Agencies

Department of Agriculture
Rural Development
<http://www.rurdev.usda.gov/wa/>
1835 Black Lake Blvd. SW, Suite B
Olympia, WA 98512-5715
(360) 704-7740

Indian Health Service
Portland Area Office
<http://www.ihs.gov/FacilitiesServices/area Offices/Portland/>
1220 SW Third Avenue, Room 476
Portland, OR 97204
(503) 326-2020

Department of Agriculture
Natural Resources Conservation Service
<http://www.wa.nrcs.usda.gov/>
316 West Boone Avenue, Suite 450
Spokane, WA 99201-2348
(509) 323-2900

Environmental Protection Agency (EPA)
Office of Water
<http://www.epa.gov/r10earth/>
1200 Sixth Street, Suite 900
Mail Stop: OWW-136
Seattle, WA 98101
(206) 553-1806

Geological Survey
Water Resources of Washington State
Water Science Center Office
<http://www.wa.water.usgs.gov/>
934 Broadway, Suite 300
Tacoma, WA 98402
(253) 552-1600

APPENDIX H

SAMPLE MAINTENANCE RECORDS

MAIN REPAIR REPORT

Main #_____ Main Size _____ Section _____ _____/4 Map #_____

Node #_____ (Valve/Main #_____) to Node #_____ (Valve/Main #_____)

Date Installed _____/_____ Type _____ Manufacturer _____

Length of Main _____ ft. Number of Connections on Main _____

Valves to Isolate _____, _____, _____, _____, _____, _____, _____

Location:

_____ side of _____

From _____ St. to _____

Other Location Information:

_____

_____

Specific Location:

_____ ft. _____ of _____

_____ ft. _____ of _____

Site Map:

Last corrected _____/_____/_____ dBase enter _____/_____/_____ Map _____/_____/_____

Remarks on back of page _____ Yes _____ No

HYDRANTS MAINTENANCE / INSPECTION REPORT

Hydrant #_____, Valve Size _____, Section _____/_____/4, Map #_____

Location:
Principle St:_____ _____ ft. _____ of center line

Intersecting St:_____ _____ ft. _____ of center line

Specific Location: Checked OK _____ or measured as follows:

_____ ft. _____ of _____

_____ ft. _____ of _____

_____ ft. _____ of _____

Caps Missing: _____, Replaced: _____, Greased: _____

Chains Missing: _____, Replaced: _____, Freed: _____

Paint: OK _____, Repaint: _____

Oper. Nut: OK _____, Greased: _____ Replaced: _____

Nozzles: OK _____, Caulked: _____ Replaced: _____

Valve & Seat: OK _____, Replaced: _____

Packing: OK _____, Tightened: _____ Replaced: _____

Drainage: OK _____, Corrected: _____

Flushed: _____ Minutes _____ Nozzle Open

Pressure: Static: _____ Residual: _____ Flow _____ gpm

Branch Valve: Condition: _____

Other Problems / Work Needed: _____

_____

_____

Work / Repairs Completed:

_____ By: _____ Date ____/____/____

_____ By: _____ Date ____/____/____

_____ By: _____ Date ____/____/____

Inspection/Maintenance Completed by: _____ Date ____/____/____

Remarks on back of page _____ Yes _____ No

VALVE REPAIR REPORT

Valve #_____ Valve Size _____ Section _____ _____/4 Map #_____

Connecting Pipe #_____ to Pipe/Node #_____, Installed_____/_____

Type _____, Connecting ends _____ x _____, Make _____

Opens _____, # of turns _____, Depth to operate nut _____

Normally _____, Valve box cold-mixed? _____ needed? _____

General Location:

Principle St:_____ _____ ft. _____ of center line

Intersecting St:_____ _____ ft. _____ of center line

Specific Location:

_____ ft. _____ of _____

_____ ft. _____ of _____

_____ ft. _____ of _____

Valve/Site Map:

Last corrected ____/____/____ dBase enter ____/____/____ CAD Map ____/____/____

Remarks on back of page _____ Yes _____ No

VALVE MAINTENANCE / INSPECTION REPORT

Valve #_____, Valve Size _____, Section _____/_____/4, Map #_____

Location:

Principle St:_____ _____ ft. _____ of center line

Intersecting St:_____ _____ ft. _____ of center line

Specific Location: Checked OK _____ or measured as follows:

_____ ft. _____ of _____

_____ ft. _____ of _____

_____ ft. _____ of _____

Found: _____, # of turns: _____, Left: _____

Packing: OK _____, Leaking: _____

Stem: OK _____, Bent / Broken: _____

Nut: OK _____, Missing / Damaged: _____

Gears: OK _____, Faulty: _____

Lid: OK _____, Missing / Broken: _____, Replaced _____

Box: OK _____, Cold mixed *Yes / No* needed? *Yes / No*

Buried *Yes / No* _____, Protruding *Yes / No* _____"

Too Close to Operating Nut *Yes / No*

Other Problems / Work Needed: _____

_____

_____

Work / Repairs Completed:

_____ By: _____ Date ____/____/____

_____ By: _____ Date ____/____/____

_____ By: _____ Date ____/____/____

Inspection/Maintenance Completed by: _____ Date ____/____/____

Remarks on back of page _____ Yes _____ No

STORAGE INSPECTION REPORT

Elevated Tank/Reservoir Name or Location _____

		YES	NO	N/A
1.	Capacity: _____ Gallons			
2.	Ventilation provided			
3.	Ventilation screen ok?			
4.	Tank outlet through bottom			
5.	Tank inlet and outlet insulated			
6.	Overflow pipe flushed			
7.	Angle flap valve screen on overflow pipe ok?			
8.	Tank drain operated and flushed			
9.	Tank drain separate from inlet and outlet piping			
10.	Screen at discharge end of drain pipe ok?			
11.	Manhole cover			
	a. Lockable			
	b. Watertight			
	c. Overhanging			
12.	Exterior ladder(s) usable and access controlled			
13.	Interior ladder			
	a. Provided			
	b. Usable			
14.	Roof watertight			
15.	Steel tanks			
	a. Interior paint adequate			
	b. Exterior paint adequate			
16.	Liquid level controls checked			
17.	Low and high level alarm checked			
18.	Recent trespass or vandalism observed			
19.	Does drain/overflow discharge to storm system?			
20.	Does drain/overflow discharge to sewer?			
21.	Does drain/overflow discharge adequately?			

Other possible source of contamination: _____

_____

Improvements needed: _____

_____

Remarks: _____

_____

EQUIPMENT SERVICE CARD

EQUIPMENT:

Item No.	Work to be Done	Frequency	
1		Daily	
2		Daily	
3		Daily	
4		Weekly	
5		Weekly	
6		Weekly	
7		Monthly	
8		Monthly	
9		Monthly	
10		Quarterly	
11		Quarterly	
12		Quarterly	
13		Bi-annually	
14		Bi-annually	
15		Bi-annually	
16		Annually	
17		Annually	
18		Annually	
19		Annually	

SERVICE RECORD CARD

EQUIPMENT:

Date	Work Done (Item No.)	Signed	Date	Work Done (Item No.)	Signed	Date	Work Done (Item No.)	Signed

MINIMUM REQUIRED SPARE PARTS AND LUBRICANT

Item No.	Name	Supplier	Phone
1			
2			
3			
4			
5			
6			

EQUIPMENT SERVICE CARD

EQUIPMENT:			
Item No.	Work to be Done	Frequency	
1		Daily	
2		Daily	
3		Daily	
4		Weekly	
5		Weekly	
6		Weekly	
7		Monthly	
8		Monthly	
9		Monthly	
10		Quarterly	
11		Quarterly	
12		Quarterly	
13		Bi-annually	
14		Bi-annually	
15		Bi-annually	
16		Annually	
17		Annually	
18		Annually	
19		Annually	

SERVICE RECORD CARD								
EQUIPMENT:								
Date	Work Done (Item No.)	Signed	Date	Work Done (Item No.)	Signed	Date	Work Done (Item No.)	Signed

MINIMUM REQUIRED SPARE PARTS AND LUBRICANT			
Item No.	Name	Supplier	Phone
1			
2			
3			
4			
5			
6			

APPENDIX I

SAMPLE BOIL WATER NOTICE

WARNING:

Do not drink tap water without boiling it first!

☐ Fecal coliform
☐ E. coli bacteria
☐ Other: _____

were detected in the water supply on:
(date)_____.

Boiling kills bacteria and other organisms in the water:

- Bring water to a boil
- Continue boiling for 3-5 minutes
- Let water cool before using

To avoid possible illness: use boiled or purchased bottled water for drinking, making ice, brushing teeth, washing dishes, and food preparation until further notice.

Contact your doctor, if you experience one or more of these symptoms: nausea, cramps, diarrhea, jaundice, headache and/or fatigue. People with chronic illnesses, infants and the elderly may be at higher risk and should seek medical advice.

Water System: _____
I.D.: _____
County: _____
Contact: _____
Telephone: _____
Date notice distributed: _____

See reverse side for more information

WARNING:

Do not drink tap water without boiling it first!

☐ Fecal coliform
☐ E. coli bacteria
☐ Other: _____

were detected in the water supply on:
(date)_____.

Boiling kills bacteria and other organisms in the water:

- Bring water to a boil
- Continue boiling for 3-5 minutes
- Let water cool before using

To avoid possible illness: use boiled or purchased bottled water for drinking, making ice, brushing teeth, washing dishes, and food preparation until further notice.

Contact your doctor, if you experience one or more of these symptoms: nausea, cramps, diarrhea, jaundice, headache and/or fatigue. People with chronic illnesses, infants and the elderly may be at higher risk and should seek medical advice.

Water System: _____
I.D.: _____
County: _____
Contact: _____
Telephone: _____
Date notice distributed: _____

See reverse side for more information

What is fecal coliform and E. coli?

Fecal coliform and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these waters can cause short-term effects, such as 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 comprised immune systems.

How long will this warning be in effect?

We will consult with the Washington State Department of Health about this incident. We will notify you when you no longer need to boil the water.

What is fecal coliform and E. coli?

Fecal coliform and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these waters can cause short-term effects, such as 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 comprised immune systems.

How long will this warning be in effect?

We will consult with the Washington State Department of Health about this incident. We will notify you when you no longer need to boil the water.

ADVERTENCIA:

¡No tome el agua de la llave sin antes hervirla!

☐ **Bacteria coliforme fecal**
☐ **Bacteria E. coli**
☐ **Otra:** _____

fueron encontradas en su sistema de agua:
(el día)_____.

Hervir el agua mata a las bacterias y otros organismos en el agua:

- **Haga hervir el agua**
- **Continúe hirviendo el agua durante 3 a 5 minutos**
- **Deje enfriar el agua antes de usarla**

Para evitar posibles enfermedades y hasta nuevo aviso: use agua hervida o agua potable embotellada para tomar, hacer hielo, limpiarse los dientes, lavar los platos y para preparar comidas.

Hable con su doctor si usted tiene uno o más de los siguientes síntomas: náusea, dolor estomacal, diarrea, ictericia, dolores de cabeza y/o cansancio. La gente con enfermedades crónicas, bebés y personas mayores de edad, pueden estar en situación de alto riesgo y deben consultar con su médico o proveedores de servicios médicos.

Sistema de agua: _____
I.D.: _____
Condado: _____
Contacto: _____
Teléfono: _____
Fecha de notificación: _____

¿Qué son las bacterias coliforme fecal y E. coli?

Coliformes fecales o E. coli son bacterias cuya presencia indica que el agua esta contaminada con desechos humanos o de animales. Microbios de esos desechos pueden causar diarrea, dolor estomacal, náusea, dolores de cabeza u otros síntomas. Pueden representar un peligro para la salud de bebés, niños y niñas de corta edad y personas con sistemas inmunológicos en alto riesgo.

¿Por cuánto tiempo va a estar en efecto esta advertencia?

Vamos a consultar con el Departamento de Salud del estado de Washington acerca de este incidente. Le vamos a notificar cuando ya no sea necesario hervir el agua.

See reverse side for English versión.

ADVERTENCIA:

¡No tome el agua de la llave sin antes hervirla!

☐ **Bacteria coliforme fecal**
☐ **Bacteria E. coli**
☐ **Otra:** _____

fueron encontradas en su sistema de agua:
(el día)_____.

Hervir el agua mata a las bacterias y otros organismos en el agua:

- **Haga hervir el agua**
- **Continúe hirviendo el agua durante 3 a 5 minutos**
- **Deje enfriar el agua antes de usarla**

Para evitar posibles enfermedades y hasta nuevo aviso: use agua hervida o agua potable embotellada para tomar, hacer hielo, limpiarse los dientes, lavar los platos y para preparar comidas.

Hable con su doctor si usted tiene uno o más de los siguientes síntomas: náusea, dolor estomacal, diarrea, ictericia, dolores de cabeza y/o cansancio. La gente con enfermedades crónicas, bebés y personas mayores de edad, pueden estar en situación de alto riesgo y deben consultar con su médico o proveedores de servicios médicos.

Sistema de agua: _____
I.D.: _____
Condado: _____
Contacto: _____
Teléfono: _____
Fecha de notificación: _____

¿Qué son las bacterias coliforme fecal y E. coli?

Coliformes fecales o E. coli son bacterias cuya presencia indica que el agua esta contaminada con desechos humanos o de animales. Microbios de esos desechos pueden causar diarrea, dolor estomacal, náusea, dolores de cabeza u otros síntomas. Pueden representar un peligro para la salud de bebés, niños y niñas de corta edad y personas con sistemas inmunológicos en alto riesgo.

¿Por cuánto tiempo va a estar en efecto esta advertencia?

Vamos a consultar con el Departamento de Salud del estado de Washington acerca de este incidente. Le vamos a notificar cuando ya no sea necesario hervir el agua.

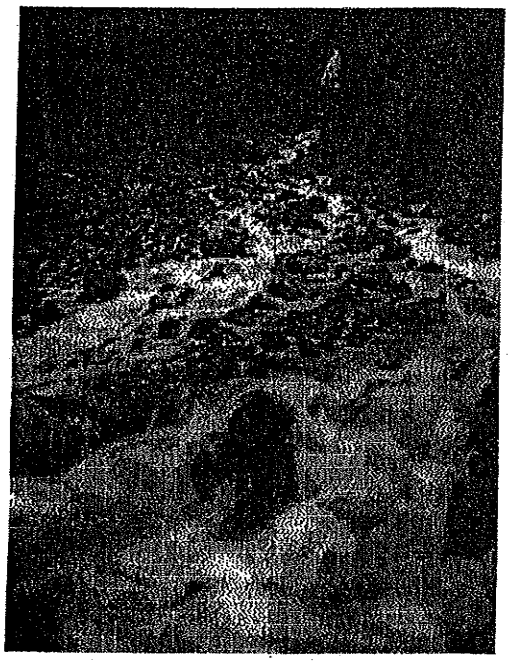
See reverse side for English version.

May 2007
DOH PUB. #331-317
(Update)

Emergency Drinking Water Sources

Requirements for using emergency sources safely

Emergency sources are wells, springs or other water sources drinking water systems use when their primary and seasonal sources are insufficient to meet consumer demands. Emergency sources can be a viable means of resolving a water supply shortage. However, the Department of Health Office of Drinking Water (ODW) only allows systems to use emergency water sources when they can show the sources are safe from a public health standpoint.



Water systems use emergency sources only during extreme, mostly unpredictable circumstances. A water system operator who anticipates using an emergency source must ensure, in advance, that the water is safe and the source will provide reliable production levels. In addition, the system must issue a health advisory to its customers before it starts using an emergency source, unless it operates the source under conditions ODW specifically approves.

State rule defines emergency water sources as:

- ODW approved for emergency purposes only.
- Not used for routine or seasonal water demands.
- Physically disconnected.
- Identified in the water system's emergency response plan.

More than 700 Group A public water systems in Washington report one or more emergency water source.

Monitoring is required

Water systems must test for coliform bacteria and nitrates before bringing an emergency source on line. ODW also highly recommends testing for inorganic chemicals, volatile organic chemicals and synthetic organic chemicals (SOCs).

The system must apply appropriate treatment if tests indicate microbiological contaminants or nitrates exceed drinking water standards. ODW may determine the need for SOC tests on a case-by-case basis.

Nitrate – The system must take special precautions (providing bottled water for at-risk individuals, blending and so on) if levels exceed the maximum contaminant level of 10 mg/L.

Inorganic or organic chemicals – The system may still use the source when levels are elevated if ODW concludes there will be no significant health impacts over the expected duration of the emergency.

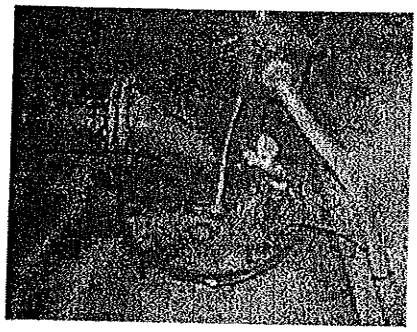
For precautions and advice, call the nearest ODW regional office (see page 4).

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

HELPING TO ENSURE SAFE AND RELIABLE DRINKING WATER

ODW ranks emergency sources in order of preference

1. **The best** is water from an ODW-approved source, including an intertie with a neighboring water system.
2. **Next** are unapproved groundwater wells with satisfactory coliform and nitrate test results.
3. **Next** is water from wells or springs with unsatisfactory coliform and nitrate results. If the nitrate level exceeds the standard, the system must issue a health advisory and take special precautions.
4. **Least preferred** is unfiltered surface water and groundwater under the influence of surface water (GWI). Systems may use these sources only as a last resort. They must issue a health advisory that will remain in effect until water is adequately treated.



Groundwater wells – The system must monitor weekly for coliform unless it can document that the source is safe for continued use. If coliform is present, the system must issue a health advisory and provide continuous disinfection.

Potential GWI and springs – The system must monitor weekly for coliform. If coliform is present, the system must issue a health advisory and provide continuous disinfection.

Unfiltered surface water and GWI – These sources are at higher risk for contamination. The system must issue a health advisory to remain in effect until the system makes provisions for effective disinfection against viruses, bacteria and protozoa (3-log for *Giardia*, 2-log for *Cryptosporidium*).

Before using an emergency source

The water system should notify customers of water quality issues or changes in service that may occur while using the emergency source. Even if the water is safe, changes in taste, color or odor may concern consumers. An emergency plan can include the best ways to tell customers what to expect, and what the system expects of them, before a system has to use an emergency source.

The system should also review source facilities to find out what water quality issues it may need to address. Even if there are no health-related concerns, aesthetic problems could occur if there are high levels of iron, lead or manganese; rust-encrusted casings, pumps and other rarely used equipment; or elevated turbidity.

Preparing emergency source pumps, valves, gauges or other equipment

Flush the source to waste, and not into the distribution system (about three casing volumes for a well). Water quality changes can occur when activating an emergency source due to flow reversals, different velocity gradients, suspension of accreted sediments, or increased porosity. You may need to flush the distribution system before initiating service from the emergency source, and possibly periodically throughout the time of the emergency.

Disinfect the source (use accepted procedures such as those in AWWA Standard C654), then flush to waste again, to ensure chlorine residual is zero before collecting coliform and nitrate samples.

Exercise all valves and operational controls to ensure they function properly.

Ensure control systems do not waste water through reservoir overflows. This is especially important if the emergency source will operate manually.

Assess the area around the source for contaminants that may be present during the time the system expects to use the source. Protect the source from all contaminating influences (chemicals, oil spillage, livestock and so on) to the extent possible.

Ask the Department of Ecology if you need to get "emergency water rights" before using an emergency source. Ecology's staff directory is online at http://www.ecy.wa.gov/org.html.

Health Implications

A system must use care when deciding whether to use an emergency source. It must test the water to ensure it meets drinking water health standards and treat it, as needed, to ensure it is safe.

The main heath concerns are:

Microbiological contaminants – Bacteria, viruses and protozoa can quickly cause severe gastrointestinal illness, diarrhea and dehydration. Surface water sources, groundwater directly affected by surface water, and shallow hand-dug wells are most vulnerable to microbial contamination. Activities near the wellhead can also contaminate groundwater (wells and some springs). Shallow, poorly constructed wells, or those recharged through porous rock formations, are especially at risk.

Nitrates – Special precautions are needed to protect unborn babies and children less than 1 year old.

Interties with other utilities using unapproved surface or ground water sources – This could occur if a water system uses an emergency intertie with an irrigation district, or any type of water provider that does not ordinarily provide drinking water.

Primary inorganic contaminants – Health effects depend on the concentration of the contaminant. They may be immediate or occur only after long-term exposure. Test all emergency sources and take precautions if the concentration exceeds levels that may affect health during the period the system plans to use the source.

Potential health effects from exposure to elevated levels of organic, and some inorganic, contaminants are less acute than microbiological contaminants. Volatile organic compounds and certain synthetic organic compounds could affect health when consumed over long periods – usually many years. They are of less concern in source water used for short duration under emergency conditions.

Health Advisories

If a system must bring an emergency source on line and the safety of the water is in question, it must issue a health advisory.

A health advisory tells customers how to stay healthy when their drinking water could be unsafe. It is issued when a water system, or state or local health officials, determines health risks are sufficient to advise customers to take action. For example, if a system brings an emergency source online without all required sampling, the advisory would inform customers the water is not, or may not be safe to drink; list ways to protect health; and let them know the system will notify them when it has water quality results.

Health advisories usually take the form of a drinking water warning, boil-water notice or bottled-water order. ODW works closely with water systems to help determine when they need to issue advisories. In any event, a health advisory must be well thought out and provide very clear messages.

ODW has tools to help water systems prepare to issue a health advisory. Learning about health advisories, and how to issue one before you need it, will make the process easier. Fact sheets, brochures and templates are online at http://www.doh.wa.gov/ehp/dw/our_main_pages/dwflood.htm

Before you activate an emergency source

Consult with the nearest ODW regional office about testing requirements, source construction issues, potential sources of microbiological contaminants in the wellhead area or watershed, and the pumping and pump control system. You may have to improve the source physically before using it.

Flush and disinfect wells. If an emergency water source is a well, plan to flush and disinfect it before using it.

Sample water sources and treat them accordingly. Collect at least two coliform samples and one nitrate sample from each emergency source before bringing it on line. If coliform is present, or nitrate exceeds the standard, you must apply appropriate treatment. For example, if you detect coliform in a well, you must provide continuous chlorination with sufficient contact time before the first point of service. Ask the ODW regional office about disinfection treatment.

ODW Regional Offices

- After Hours Hotline (877) 481-4901
- Northwest - Kent (253) 395-6750
- Southwest - Tumwater (360) 236-3030
- Eastern - Spokane (509) 456-3115

Warn your customers. If you plan to use an unfiltered surface water source, you must issue a health advisory to all customers before and during the period the source is in service. You must work closely with your ODW regional office if your emergency source is unfiltered surface water or inadequately treated ground water under the direct influence of surface water.

Continue coliform sampling. Once an emergency source is on line, expect to sample for coliform at least once a week, unless your ODW regional office specifies an alternate monitoring schedule.

Continue chemical sampling. If the emergency source operates longer than two months, expect to sample for complete inorganic and organic chemicals as prescribed by your ODW regional office.

Finally, if you bring an emergency source on line without advance planning or water quality testing, you must immediately issue a health advisory to remain in effect until the water quality is established.

Keeping your emergency source ready for use

Water systems use emergency sources only during emergencies. Sometimes water systems have problems getting them into operational condition when they need them. Most problems occur when water quality changes or operational components deteriorate during the vast majority of time, when systems are not using them.

To ensure emergency sources are ready to use, systems should have a maintenance strategy, make needed repairs in a timely manner and keep good records of inspections. The strategy should include:

Testing – To protect water quality, periodically test the source water for coliform and nitrates. Quarterly testing is usually appropriate. A system may need more frequent testing, possibly monthly, if it expects to use the source more often during a particular time of the year, or a drought. A good practice is to assess the source and develop a sampling plan to fit the water system's needs.

Inspecting – To keep components in good working order, inspect physical facilities and operational controls at least quarterly. Check electrical connections and components for corrosion; inspect the sanitary seal, vents and other hardware; and clear undesirable items away from the source.

Operating – To ensure the source is ready to produce a water sufficient supply, periodically operate the pump(s). It is also important to check and exercise all valves and controls.

DRINKING WATER WARNING

The _____ Water System, ID_____, located in _____County is contaminated with fecal coliform/ *E. coli* bacteria.

Fecal coliform/ *E. coli* bacteria were detected/confirmed in the water supply on _____. These bacteria can make you sick and are a particular concern for people with weakened immune systems.

DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST. Bring all water to a boil, let it boil 3 – 5 minutes, and let it cool before using. Boiled or purchased bottled water should be used for drinking, making ice, brushing teeth, washing dishes, and food preparation until *further notice*. Boiling kills bacteria and other organisms in the water.

Fecal coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as 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. The symptoms above are not caused only by organisms in drinking water. 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 provider.

What happened? What is the suspected or known source of contamination?

The following is being done to correct the problem:

We have consulted with the Washington State Department of Health about this incident. We will notify you when you no longer need to boil the water. We anticipate resolving the problem by _____.

For more information, please contact _____ at ( )___-_____ or at _____.
(owner or operator) (phone number) (address)

Please share this notice 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 distribution copies by hand or mail.

This notice is sent to you by _____ Water System on ___/___/____

Your logo or
company name here.

News Release

For Immediate Release: <DATE>
Contact: Water purveyor/system contact name and telephone number

<Water System> announces boil water advisory for all customers in <area>

CITY NAME — The <SYSTEM NAME> is advising all water customers to boil their drinking water after recent samples showed the presence of <fecal coliform, E. coli, total coliform>. The Washington State Department of Health (DOH) has been notified and <SYSTEM NAME> is working closely with the Office of Drinking Water to find the source of contamination and fix the problem, which may include disinfecting the system. The boil water advisory will remain in effect until further notice.

<System spokesperson quote> (e.g. "We are doing all we can to eliminate the bacteria from the water system. Safe and reliable drinking water is critical to good health and responding to this kind of emergency is our highest priority," said system spokesperson.)

<NUMBER or NO> illnesses related to the community's drinking water have been reported. To correct the problem <WHAT IS BEING DONE> (e.g. Chlorine was applied to the entire system on DATE.)

The boil water advisory includes several precautionary steps that customers should take. These include using purchased treated bottled water or boiled water for any water that might be consumed: drinking, brushing teeth, dishwashing, preparing food and making ice. Water should be boiled for 3-5 minutes, then allowed to cool before using.

The advisory will remain in effect until <SYSTEM NAME> and DOH are confident there is no longer a threat of illness to their customers. Once satisfactory results are reported, customers will be notified that the advisory has been lifted.

If you have any questions, please call us at <TELEPHONE NUMBER>.

###

Your logo or
company name here

News Release

For Immediate Release: <DATE>

Contact: Water purveyor/system contact name and telephone number

<Water System Name> Boil Water Advisory Rescinded

CITY NAME – The <SYSTEM NAME> is advising all its water customers that it is no longer necessary to boil their drinking water. Recent test samples show the absence of <fecal coliform, E. coli, total coliform> bacteria.

<SYSTEM SPOKESPERSON QUOTE> (e.g. "Working with the Washington State Department of Health over the last <NUMBER OF > days, we have completed inspections, water quality sampling, disinfection, and flushing to resolve the contamination problem," stated <NAME OF WATER SYSTEM MANAGER>. "We're pleased to be able to lift the boil water advisory."

The inspection of the water system indicated <DESCRIPTION OF SOURCE OF CONTAMINATION, if known, and what will be done to maintain good water quality>

If you have shut off or not used fixtures, water fountains, ice machines, soda machines, and/or other equipment over the past several days, flush the fixture or equipment until there is a change in water temperature before putting it back into service.

. The <SYSTEM NAME> encourages customers with questions to call <TELEPHONE NUMBER>.

###

APPENDIX J

EMERGENCY CONTACT LIST

NORTH BONNEVILLE WATER SYSTEM
EMERGENCY NUMBERS

DOH 24 hour emergency number 1-877-481-4901
DOH Regional Engineer – Jozsef Benvics – 360-236-3034
DOH Regional Planner – Darin Klein – 360-236-3038
Evergreen Rural Water 800-272-5981 (w)
Dept. of Ecology David Knight 360-407-6277 (w)

EMERGENCY TEST LAB 24 hour service ADDY LABS
Carl Addy cell# 360-771-5798 home# 360-669-3066
Lab # 360-750-0055
Tom Newman cell# 360-771-7345 home# 360-263-5184
Debbie Dunahoo home# 360-696-4198

WELL HOUSE EMERGENCY PUMPS FAIL - ELECTRICAL - MECHANICAL – TELEMETRY
Jack Tallmage cell # 360-887-1500 electrical / telemetry
Garrett Kitchen cell # 503-730-0584 electrical / telemetry
Mark Currie cell # 503-539-4066 home # 503-666-4170 electrical / telemetry
Des with Mather Pump cell # 360-253-1105 home # 360-686-4244 electrical / mechanical
Tim LaLonde cell # 360-798-4751 electrical
Mark with Mather Pump cell # 360-253-1107 home # 360-687-9721 electrical / mechanical
Mather Pumps mechanical / parts/heavy equipment/manpower
8 -5 office # 306-256-1310
Lisa St. Denis 360-686-4244 (h) 360-253-0885 (c)
Mark Burroughs 360-687-9721 (h) 360-253-1107 (c)
Mike Strickland 360-687-7222 (h) 360-253-1105 (c)

TELEMETRY INFO:
Telemetry # 509-427-0037
Customer # 059
Circuit # .SGNA.5732..UDNW
Pair # 73
Century Link Repair Service # 1-800-786-6272
Bill Muncey - Head Engineer at Hood River 541-387-9346 cell # 509-310-9469

SiO2 PUMP PROBLEMS: Chemco 360-608-3870

WATER MAIN BREAKS:
Sheldon Price, Utilities Manager, Cascade Locks, cell # 541-490-5610
Gordy, City of Stevenson, cell # 509-250-2392 City Hall # 509-427-5970
Stevenson Operations Mgr, Eric Hanson 509-427-5970 (w) 360-609-5320 (c)
Eric Levison, Utilities Manager, Camas, cell # 360-608-4309 (h) 360-210-4302 360-817-7003 (w)
City of Camas after hours EMERGENCY # 360-737-0592
Thomas Knackstedt, Evergreen Rural Water, cell # 425-760-2894
Washougal Asst. PW Director Jim Dunn 360-835-2662 (w) 360-772-1611 (c)

EMERGENCY WATER SOURCE:
A&J Select (example: 2hrs to deliver 2400 gallons of bottled water)
Call: John Mobley home # 509-427-7576 or 5491 (store) cell # 541-490-2434 or cell # 541-399-3992

CONTRACTORS:
Downs Const. Washougal, (Mike) 360-903-8731 or (Daryl) 360-903-8716
Paul Lambson, N. B. 509-427-4069
Jim Jefferson, N.B. cell # 360-433-8717
McClure & Son, Joe Aal, cell # 206-963-2373
Gail Collins, Stevenson, cell # 360-773-5280

WATER AND SEWER PUMPS AND SUPPLIES
Godwin Pumps, Glen McCord, cell # 503-572-3912 shop # 503-981-0341
PACO Pumps, Emergency 24/7 number: 503-224-6330
Mather Pump, Shop/Office # 360-256-1310 or 24 hr #360-253-1107 (Mark's #)
Northwest Pump & Equipment, 1-800-452-PUMP
HYDRONIX Pumps, 503-659-6230
Cornell Pumps, 509-766-6330 or 503-653-0330
Steve's Pump Service, 24 hr # 503-658-3051
DeVaux Pump, 360-635-1147

PS# 2 distance to nearest MH – 608 feet
PS# 3 distance to nearest MH – 705 feet, 700 feet of hose will reach

Staff

Mayor Don Stevens	541-400-9535 (c)	509-427-4906 (h)
Administrator John Spencer	360-903-3763 (c)	360-844-5136 (h)
Asst. Utilities Mgr Bryan Henrichsen	541-490-2370 (c)	509-427-8734 (h)
Utilities Operator Cameron Russell	541-490-7576 (c)	509-427-7393 (h)
City Engineer, Ron Bush	503-329-8017(c)	503-668-8265 (h)
Former Utilities Manager Ray Hays	509-427-8631 (h)	

APPENDIX K

CROSS-CONNECTION CONTROL RESOLUTION

Title 13

PUBLIC UTILITIES

Chapters:

Chapter 13.04

WATER SYSTEM*

Sections:

* Prior ordinance history: Ords. 523, 615, 635, 660, 676, 681, 698, 726, 730, 755, 767 and 807.

13.04.010 Right of service.

All persons, corporations, partnerships, associations or otherwise owning or occupying real estate property within the distribution system of the city water system, shall be entitled to use water from the system for any lawful purpose pursuant to the charges, rates and regulations, hereinafter provided in this chapter. (Ord. 831 (part), 2003)

13.04.020 Definitions of terms.

As used in this chapter, the following terms are defined:

"Base capacity" means the existing maximum capacity of the system to supply water at a given sustained rate.

"Bimonthly" means occurring every two (2) months.

"Capacity" means the physical capability of the water well(s), pumping system, reservoir supply, and distribution lines to supply potable water at a given sustained volume necessary to meet minimum fire flows, throughout the system, simultaneously with meeting demands for domestic consumption. The capacity of the system shall be measured in terms of its maximum capability to supply water at a sustained rate. Each element of the system shall enter into measurement of sustained capacity: (1) resource (the well and aquifer); (2) pumping system; (3) reservoir storage; and (4) sizing of distribution lines.

"City" means the City of North Bonneville, Washington.

"City Council" means the City Council of North Bonneville, Washington.

"Connection fee" means the fee due of property owners who wish to establish a service connection to the utility.

"Commercial/industrial users" means any establishment other than a residence using water from the system exclusive of the municipal needs of the city.

“Commercial zone” means areas zoned commercial use including, but not limited to, Central Business District (CBD), Commercial (C-1), Commercial Recreation (CR), Industrial/Business Park (I/BP) and Mixed Use (MU).

"Demand flow" means the demand for a flow of potable water at a given sustained rate to meet peak demand for fire flows and domestic consumption for any given single element, structure, development, or complex or developments within the city.

"Department" means the water/sewer department of the City of North Bonneville.

"Industrial" means industrial sewer hookups for those lots designated by ordinance of the City of North Bonneville and located in the industrial/business park zone.

"Mains" means a water line designated or used to serve more than one (1) premises.

"Mayor" means the Mayor of North Bonneville, Washington.

"Meter size" relates to the size of the pipe on the discharge side of each meter.

"Minimum monthly charge" means the minimum fee levied to each customer who has water service available and has paid the required connection fee.

"Multifamily dwelling" means:

1. A building containing two (2) or more dwelling units, designed to house two (2) or more families living independently of each other; or

2. A cluster of buildings, each building being designed to house one (1) or more families living independently of each other.

"Person" means natural persons of either sex, associations, company partnerships and corporations, whether acting by themselves or by a servant, agent or employee, the singular number shall be held and construed to include the plural and the masculine pronoun to include the feminine.

"Premises" means a private home, building, apartment house, condominium, trailer court, mobile home park, a group of adjacent buildings or property utilized under one (1) ownership and under single control with respect to use of water and responsibility for payment therefor.

"Public Utility Official" means the water system representative of the City of North Bonneville.

"Residence" means single-family dwelling houses, manufactured homes, duplex units or multifamily apartments leased or rented for occupancy periods of one (1) month or greater.

"Sizing" means the increased physical sizing of lines, equipment, physical plant, and any and all elements of the system necessary to accommodate any demand flow, existing or proposed.

"System" means all water source and supply facilities, transmission pipelines, and storage facilities, pumping stations, distribution mains and appurtenances.

"Treasurer" means the City Clerk/Treasurer of the City of North Bonneville.

"Water utility service" means all piping and fittings from the main line to and including the water meter assembly. (Ord. 923, 2007: Ord. 872 (part), 2005; Ord. 831 (part), 2003)

13.04.030 Application for service.

A. Application for water service shall accompany an application for a building permit. Water shall not be turned into service until all delinquent water service charges, penalties, connection charges, or other claims and charges against the premises or owner have been paid in full, or other arrangements made as provided in this chapter.

B. If any application for connection of the water system or for the use of water shall be made by any person other than the owner of the premises to which the water shall be furnished, then the applicant shall deposit with the City Treasurer a sum equal to four (4) months flat rate or minimum charge as provided in Section 13.04.060 of this chapter and which sum shall constitute a refundable deposit for security for any water charges thereafter accruing. (Ord. 831 (part), 2003)

13.04.040 New service--First billed.

Upon connection to the system, the lot owner will be charged the monthly water fee, as shown in Section 13.04.060. (Ord. 831 (part), 2003)

13.04.050 Payment.

A. The charges for water shall accrue monthly and if not paid on or before 20 days after the date of billing, the charges shall be deemed to be delinquent, a $10.00 late fee will be added to the account and a notice of the delinquency shall be sent, allowing an additional 10 days to pay full amount due or make payment arrangements. If payment or payment arrangements have not been made by the thirtieth day following the date of billing, water service shall be discontinued until all charges have been fully paid, together with a $60.00 turn-on fee.

B. It is unlawful for any persons to tamper with, or in any manner deface any water meter or valve or otherwise re-establish the discontinued service except as provided in this section.

C. Where water service has been discontinued for any reason and the water is turned on by the customer or other unauthorized person, the water may then be shut off at the main or the meter removed. The charges for shutting off the water at the main or removing the meter shall be computed to actual cost to the department plus 20% overhead, but not less than $20.00. These charges shall be billed to the offending customer and water shall not be furnished to the premises until such charges are paid. Any further violation shall constitute theft of a service and be subject to the penalty set forth in Section 13.04.310. (Ord. 982, 2011; Ord. 971, 2010; Ord. 831 (part), 2003)

13.04.060 Rate schedule.

All water services shall be metered.

A. The minimum monthly service charge for water for all customers shall be $17.00.

B. Multifamily dwellings shall have each dwelling unit individually metered and shall be billed accordingly. The minimum monthly service charge for water furnished to multifamily dwellings not individually metered shall be $17.00 multiplied by the number of units serviced.

C. Meter Charge for Water Consumption.

The minimum service charge shall not include any water. All water shall be charged in increments of 100 cubic feet. In 2011 the rate shall be $1.66 per 100 cubic feet.

On January 1st of each year thereafter, this rate shall increase according to the Consumer Price Index for All Urban Consumers (CPI-U) as of August of the previous year, rounded to the nearest penny.

D. Service for fire protection systems will be charged on a metered basis.

1. All fire protection systems (whether sprinkler or hydrant) shall be installed and billed as a separate service from any main water service.

2. All fire protection systems will be equipped with flow-detector check valves and backflow prevention valves at customer's expense.

3. Use of water through a fire protection system for uses other than fire protection is strictly prohibited. The city reserves the right to bring a civil action for damages against any person who uses water through a fire protection system for uses other than fire protection, according to RCW 80.28.240.

(Ord. 982, 2011; Ord. 971, 2010; Ord. 872 (part), 2005; Ord. 831 (part), 2003)

13.04.065 Failure to read.

In the event that it shall be impossible or impractical to read a meter on the regular reading date, the water usage will be billed based upon the usage from the last billing cycle. (Ord. 831 (part), 2003)

13.04.070 Connection fees--Established--Payment due.

Water connection fees levied by this chapter shall be due at the time of issuance of a building permit and prior to connection to the system.

Meter Size	**Connection Fee**
Up to and including 1 inch	$ 4,000.00
1 1/4 and 1 1/2 inch	5,000.00
2 inch	6,500.00
3 inch	7,500.00
4 inch	9,000.00
6 inch	11,000.00
8 inch	13,000.00
10 inch	15,000.00

A. Each dwelling unit within a Multi-family structure, connecting to the city water system shall be charged the basic connection fee determined by water meter size.

B. Persons are prohibited from paying connection fees at any time unless accompanied by a valid building permit, except in the case where permanent structures already exist.

C. Upon approval of the connection by the city and after water flow is turned on, the property owner will be charged the minimum monthly rate as applicable to the lot or type of development. D. Each unit, within a structure, connecting to the city water system within a commercial zone shall be charged the basic connection fee determined by water meter size. (Ord. 923, 2007: Ord. 927, 2007: Ord. 907, 2006; Ord. 872 (part), 2005; Ord. 831 (part), 2003)

13.04.080 Service installation--General.

The property owner shall be responsible for the cost required for installation of the service lateral from the main trunk line to the premises. All installations shall be reviewed and approved by the Public Utility Official of the city prior to construction. (Ord. 831 (part), 2003)

13.04.090 Service installation--Special condition.

Any premises shall not be permitted to furnish water to any other premises except during an emergency which shall not exceed a period of thirty (30) days. An application to cover the emergency connection shall be filed with the department within forty-eight (48) hours of its occurrence. When intended use of water service is changed or the structure served is altered, a new service shall be installed at the

customer's expense unless the existing service complies with current city regulations. (Ord. 831 (part), 2003)

13.04.100 Service installations--Locations of service pipe.

All water service piping from the water main to the meter shall be laid not less than twenty-four (24) inches below the surface of the ground, or street surface and shall be of copper drawn tubing with no joints below street surface and imbedded in a six (6) inch layer of leveling material. All meter boxes shall have a six (6) inch layer of leveling course material below pipe and line shall not be less than twenty-four (24) inches below ground level at meter box. Plumbing from meter to premises shall be installed to current Uniform Plumbing Codes adopted by the City Council. (Ord. 831 (part), 2003)

13.04.110 Requirements for plumbing.

All persons installing fixtures or appliances to be supplied with water from the city water mains shall be subject to the requirements of the applicable official plumbing code of the city. Persons installing plumbing in new buildings shall leave the valve at the meter in the "Off" position until city inspection is completed and approved. The city shall have the right to refuse service in any situation where it is discovered that applicable city standards have not been complied with in making the installation. (Ord. 831 (part), 2003)

13.04.120 Water shut off.

A. After request is made for short-term (less than one (1) week) water turn off by landowner or tenant, authorized city staff will turn off water service at no charge if it can be accomplished during normal business hours.

B. After request is made for long-term (greater than one (1) week) water turn off by landowner or tenant, authorized city staff will turn off water service. A sixty dollar ($60.00) turn on fee will be charged for water service to be reinstated.

C. Any request to turn off water service which requires immediate action by authorized city staff and cannot be accomplished during regular working hours, shall be deemed to constitute an emergency shut off. Any emergency shut off is subject to a thirty-five dollar ($35.00) fee, in addition to the sixty dollar ($60.00) turn on fee. (Ord. 831 (part), 2003)

13.04.130 Liability disclaimer.

The city shall not be liable for any damage to persons or property that may result from the turn off or turn on of the water service or from the service being left on when the premise is unoccupied. (Ord. 831 (part), 2003)

13.04.140 Meter ownership.

All water meters shall remain the property of the City of North Bonneville. (Ord. 831 (part), 2003)

13.04.150 Water charges constitutes lien.

A. The Clerk of the city may use such means of collection as may be provided by the laws of the State of Washington or permitted by the Charter and ordinances of the city.

B. The property owner shall be ultimately responsible for all water service charges to the property.

C. Any delinquencies shall be levied against the property in the form of a lien filed with the County of Skamania for the amount that is delinquent up to four (4) months service fees.

D. In the event it becomes necessary to file a lien, all costs incurred by the city to file the lien shall be the responsibility of the property owner and said costs shall be included in the lien. (Ord. 872 (part), 2005; Ord. 831 (part), 2003)

13.04.160 Accounting.

A. The Clerk of the city is directed to collect the water service charges and connection fees as provided for herein.

B. Water service fees shall be paid into a fund designated as "water fund." Meter and connection fees shall be paid into a fund designated as "water reserve fund." (Ord. 831 (part), 2003)

13.04.170 Required use of city water.

All owners of premises within the city limits, on which premises water is consumed by the owner or occupant thereof for domestic, industrial or other use, shall within one hundred eighty (180) days from the date of enactment of the ordinance codified in this chapter connect their premises to the municipal water supply system of the city. Provided, however, that this requirement shall not apply to any such owner whose property line does not abut a right-of-way or easement in which is located a water distribution line or service installation. Existing private or public water systems established prior to the passing of the ordinance codified in this chapter may be excluded from a mandatory connection to the city water system if State of Washington Health Standards can be met. Water samples must be taken under the guidelines set forth by the state which apply to the various types and sizes of private or public water systems. Copies of the test results must be supplied to the city. If test results indicate a decline in the water quality of the private or non municipal public system, the city will require an evaluation of the conditions by the local health district. If deterioration of the system persists and is determined by the local health district to be hazardous to the health and welfare of its users, the system will be discontinued and affected users will be required to connect to the municipal City of North Bonneville system. When required, connection to the public water shall be made in accordance with the provisions of this chapter, within ninety (90) days after the date of official notice to do so. In the event that, during such period of ninety (90) days, such owner files his written objections with the city against so being required to connect to the facilities, the provisions of this section shall not be enforced upon such owner until the City Council shall have, at a meeting thereof, heard such objections of such owner, and rendered its decision thereon. Such meeting shall be held not less than ten (10) days or more than forty-five (45) days after the date of the filing of such objections. Not less than seven (7) days prior to the date set for such meeting, the City Council shall give due notice of the date set therefor to such owner. The decision of the City Council shall be final and no appeal shall be taken therefrom by such owner except as is provided by law. (Ord. 831 (part), 2003)

13.04.180 Refusal to connect--Connection by city--Cost assessment--Lien.

If any property owner fails, neglects or refuses to connect his lands, buildings, or premises to the city water system within the time specified in the notice referred to in Section 13.04.170 the city shall make, or cause to be made, such connection. The cost of the connection shall be assessed against the property so connected and the amount of such cost shall become a lien upon the premises so connected. The city attorney may be authorized, empowered or directed by the City Council to collect the amount of the cost of such connection, either by foreclosure of the lien or by a suit against the property owner of the premises, which suit shall be maintained in the name of the city as plaintiff, in any court of competent jurisdiction. (Ord. 831 (part), 2003)

13.04.190 Meter maintenance and repair.

A. The water department shall at the city's expense maintain and repair all domestic, commercial and industrial service meters and shall replace meters periodically when necessary if rendered unserviceable by ordinary use.

B. Where replacements or repairs to any meter are made necessary by the wilful act, neglect or carelessness of the owner or occupant of the premises served, all expenses of such replacement or repairs incurred by the water department shall be borne by the owner or occupant of the premises.

C. Meter Tests. Before making a test of any meter, the person requesting such test shall at the time of filing his request with the City Water Department, pay testing fee to the City Clerk/Treasurer in the amount charged for such test, subject to the conditions herein stated, which charges are as follows:

For testing:	
5/8" to 1 1/4" meter	$15.00
1 1/2" to 2" meter	20.00
Above 2" meter	50.00

In the event the meter is found to be defective, a new meter shall be installed at city expense.

It shall be deemed unlawful to conceal a water meter or render it inaccessible by utility crews. Should a meter become concealed or inaccessible, labor costs for locating and uncovering the meter for routine inspection and maintenance shall be charged to the owner of the property which the meter serves. (Ord. 831 (part), 2003)

13.04.200 Adjustments.

Installation and maintenance of water service lines from the meter to the building or premises of private property is the responsibility of the private landowner, as well as any water lost due to leaks or breakage.

In the event of a leak the owner may be entitled to an adjustment on their bill. The landowner must report the leak's discovery to the city within seven (7) days of discovery and provide proof of repair of the leak within ten (10) days of discovery. After these conditions have been met the owner may apply to the city for an adjustment of the metered excess charges. All applications for adjustments will be submitted to and reviewed by the City Clerk/Treasurer. The adjusted rate for the period in which the leak was detected shall be equal to the metered water charges of the same period from the previous years as the month the leak was detected. Said usage shall be the adjusted rate for the period in which the leak was detected. All leak adjustments will be approved by the City Council prior to crediting the account. The landowner shall be entitled to the benefits of this section not more than one (1) time per recorded owner or owners per property. Credits shall not be permitted on account of leaking toilets, plumbing fixtures or hoses. (Ord. 952, 2009; Ord. 831 (part), 2003)

13.04.210 Emergency interruption of service.

In case of emergency or whenever the public health, safety, or the equitable distribution of water so demands, the Mayor may authorize the department to change, reduce, limit, or temporarily discontinue the use of water. Water service may be temporarily interrupted for purposes of making repairs, extensions or doing other necessary work. Before so changing, reducing, limiting or interrupting the use of water, the department shall notify, insofar as practicable, all water consumers affected. The city shall not be responsible for any damage resulting from interruption, change or failure of the water supply. (Ord. 831 (part), 2003)

13.04.220 Construction interference.

All persons, firms, corporations and governmental agencies, and their contractors performing street work that may interfere, conflict, affect, or endanger the water system of the city shall apply for a permit with the department not less than two (2) city working days prior to commencing work. Approval must be given by the city prior to any work beginning. (Ord. 831 (part), 2003)

13.04.230 Cross-connection prevention.

Cross-connections between the city's water system and any other source of water are prohibited, unless authorized by the city in combination with the use of a backflow-prevention assembly. Service connections and individual customer plumbing systems shall be constructed and maintained so as to prevent backflow of potentially contaminated water into a potable water system. The control or elimination of cross-connections shall be in accordance with the provision of WAC 246-290-490, as modified from time to time. The city reserves the right to inspect all customer water facilities to ensure that no cross-connections exist. At any time an unauthorized cross-connection is discovered and it is not immediately eliminated, that water service will be terminated until the cross-connection is eliminated. (Ord. 831 (part), 2003)

13.04.240 Backflow-prevention assemblies.

The city shall require a customer to install a backflow-prevention assembly on the customer's plumbing system or service connection. Customers required to install backflow-prevention assemblies include, but are not limited to those who:

A. Operate commercial or residential fire sprinkler system connected to their plumbing;

B. Operate an irrigation system connected to their plumbing;

C. Maintain cross-connections of their water system with air-conditioning systems, medical equipment, or other devices or processes where chemical, microorganisms, or other objectionable substances may be drawn into the water system.

The entire cost of installing a backflow-prevention assembly shall be borne by the customer, and the assembly shall remain in the customer's ownership and as the customer's responsibility. Periodic inspections and repairs of backflow-prevention assemblies, as required by WAC 246-290-490, shall be arranged by customers at their own expense, using firms or individuals who are licensed cross-connection control specialists. A signed copy of the inspector's completed report shall be provided to the city to confirm that assemblies are operating in a satisfactory manner. Inadequate maintenance of a backflow-prevention assembly shall be grounds for termination of water service. (Ord. 831 (part), 2003)

13.04.250 Water testing.

The city will collect water samples and have tested for bacteria count no less than every thirty (30) days. (Ord. 831 (part), 2003)

13.04.260 Fire service water easement.

Those properties requiring a six (6) inch or larger water service for public fire flow protection, shall provide a dedicated ten (10) foot easement and right-of-entry to the city for inspection and service of any on-site fire hydrants. (Ord. 831 (part), 2003)

13.04.270 Right-of-entry--Large water service area.

Developments consisting of more than one (1) metered premise, shall provide a signed right-of-entry authorizing city utility personnel to install, service and read individual meters as appropriately located throughout the property. (Ord. 831 (part), 2003)

13.04.280 Request for new supply mains.

A. Any property owner, or agent working in the owner's behalf, requesting a water main extension shall provide the city with a site plan and statement of use or uses for which the request is made. The statement of use shall include technical data on the proposed needs for water supply, demand flows, that will be generated by the proposed use or uses. The site plan shall illustrate and identify the location of all main lines and lateral extensions, points of desired hookups or meter boxes.

B. The plans and specifications shall illustrate and describe the method, location and materials required to connect to the city distribution system. Any property owner or agent acting in an owner's behalf, who proposes to subdivide unplatted lands or resubdivide platted lands, through plat amendments, boundary adjustments or otherwise, shall submit detailed plans and specifications prepared by a registered engineer as set forth herein, which shall be subject to specific approval by the city. Request for water service and plans relating thereto shall be evaluated based upon the demand flows generated, the base capacity of the existing system, and sizing that may be required due to any proposed development to insure a maintenance of capacity to meet peak domestic demand and fire flow requirements. Plan approvals or rejections shall specifically note the obligations of the owner, developer, or other parties regarding the cost of sizing to meet generated demand flows. (Ord. 831 (part), 2003)

13.04.290 Authorized use of hydrant and hydrant water.

A. Hydrant will not be approved for use if it is the sole hydrant available to service the area where it is located. Application for hydrant use shall be considered for the following purposes: construction, dust abatement, road maintenance and/or construction.

B. It is unlawful for any person other than an authorized city employee, authorized volunteer or member of the Fire Department to operate fire hydrants and hose outlets unless proper arrangements have been made for payment and the city has granted permission. Persons wishing to obtain permission for the use of a hydrant shall file a North Bonneville hydrant use application with the city. An authorized city employee will review and disapprove/approve use and/or location upon service request and filing of a hydrant use application. The costs to repair damage to a fire hydrant shall be the responsibility of the applicant.

The base fee for hydrant use shall be based according to the following as indicated on hydrant use application:

1--7 days	$125.00
8--14 days	250.00
15--21 days	375.00
22--31 days	500.00

C. All hydrant use shall be relinquished if needed, in case of an emergency.

D. Charges for water consumed by the City of North Bonneville for fire hydrants shall be paid from the City General Fund and deposited into the water fund.

E. In addition to the base fee, the rate for each fire hydrant or stand pipe shall be $1.66 per 100 cubic feet per month. (Ord. 982, 2011; Ord. 971, 2010; Ord. 872 (part), 2005; Ord. 831 (part), 2003)

13.04.300 Plan review and data analysis fee.

A plan and specification review fee shall be charged to cover the cost of review and analysis of submitted plans, demand flow and sizing data and processing the proposed water extension request. The Building Official may request plans and specifications be approved and stamped by a registered engineer. This provision shall not apply to any request for service for an existing meter head situated or as providing service to an existing platted lot as of the date of the enactment of the ordinance codified in this chapter. The plan review fee set forth in this section applies to those projects, land subdivisions or developments of whatever nature that require extension of water mains that require accommodations for fire protection and fire flows. A flat fee of one hundred fifty dollars ($150.00) shall be charged as a planning and processing fee at the time of application. An on-site material, ditching, bedding, connection, testing and backfilling inspection fee shall be charged for those plans approved and actually constructed. The on-site construction inspection fee shall be at actual cost for materials and labor expended by the city plus twenty (20) percent for overhead and administration. (Ord. 831 (part), 2003)

13.04.310 Penalties.

Any person violating any of the terms of this chapter shall be subject to a fine in accordance with Section 7.01.020(C) for each infraction. (Ord. 971, 2010; Ord. 831 (part), 2003)

Chapter 13.12

SEWER SYSTEM

Sections:

13.12.010 Authority and intent.

Pursuant to the statutes of the State of Washington and the powers granted the City of North Bonneville, the city does declare its intention to acquire, own, construct, equip, operate and maintain sanitary sewers, sewage pump stations, sewage treatment plants and outfall sewers; to extend and expand the existing sewer system of the city to areas exclusively within the incorporated municipal boundaries; and to reconstruct such existing sanitary sewers, sewage pump stations and sewage treatment plants as may be deemed necessary by the City Council. (Ord. 832 (part), 2003)

13.12.020 Definitions.

As used in this chapter, the following terms are defined:

"Base capacity" means the existing capacities of the system prior to any sizing for increased demand flows.

"BOD" means biochemical oxygen demand.

"Building sewer" means sewer line construction between the building and the city sewer line.

"Capacity" means the physical capability of the collection and treatment system to receive and process municipal sewage as measured on a volume scale of gallons per day or hour or other measure that may be deemed appropriate by the city.

"City Administrator" means the employee charged with administration of this chapter.

"Commercial" means any premise connected to sewer that operates as a business including home-based businesses with foot traffic.

“Commercial zone” means areas zoned for commercial use including, but not limited to, Central Business District (CBD), Commercial (C1), Commercial Recreation (CR), Industrial / Business Park (I/BP) and Mixed Use (MU).

"Connection fee" is that fee due of property owners who wish to establish a service connection to the utility. The fee is due and payable at the time of issuance of a building permit.

"Demand flow" means the flow of municipal waste from any single element, structure, development or complex of developments within the city that places a direct demand for collection and processing upon the system.

"Equivalent service use" means any nonresidential use which has been reasonably found to place an additional demand on the city sewage system.

"Industrial" means industrial sewer hookups for those lots designated by ordinance of the City of North Bonneville and located in the industrial /business park zone.

"Minimum monthly charge" is the minimum fee levied to each customer who has water sewer service available and has paid the required connection fee.

"Multifamily dwelling" means:

1. A building containing two (2) or more dwelling units, designed to house two (2) or more families living independently of each other; or

2. A cluster of buildings, each building being designed to house one (1) or more families living independently of each other.

"Natural outlet" means, but not limited to, streams, ponds, drainage ditches, bioswales, catch basins, lakes and sloughs.

"Public Utility Manager" means the employee or representative of the city authorized to perform the duties designated in this chapter.

"Pumping unit" means a pump for raising sewage to gravity flow level of sewage line.

"Sanitary sewer" means a sewer which carries sewage and to which storm, surface and groundwater is not intentionally admitted.

"Service connection" means a connection point of the building sewer line and city sewer line at the property line.

"Sewage" means a combination of the water-carried wastes, from residences, business buildings, institutions and industrial establishments, together with such ground, surface, and stormwaters as may be present.

"Sewage treatment plant" means any arrangement of devices and structures used for treating sewage.

"Sewer" means a pipe or conduit for carrying sewage.

"Sewerage system" means all city-owned facilities for collecting, pumping, treating and disposing of sewage.

"Sizing" means the increased physical sizing of lines, equipment, physical plant and any and all elements of the collection and treatment system necessary to accommodate any demand flows existing or proposed. (Ord. 873 (part), 2005; Ord. 832 (part), 2003)

13.12.030 Sewer service extensions--Site plan.

Any property owner, or agent working on the owner's behalf, requesting a sewer service extension shall provide the city with a sewer site plan and statement of use for which the request is made, and shall be required to obtain a signed approval of the plan by a registered engineer. The statement of use shall include technical data on the proposed generation of demand flow and sizing of the system. The site plan shall illustrate and identify the location of all extensions, points of desired hookup to existing facilities,

and stub-outs for all service connections within any given development. The plan shall illustrate and describe the method, location and materials required to connect to any city sewer main or manhole. Any property owner, or agent acting on an owner's behalf, who proposes to subdivide unplatted lands or resubdivide platted lands, through plat amendments, boundary adjustments, or otherwise, shall submit detailed plans as set forth in this section which shall be subject to review and approval by the City Utilities Manager and Planning Advisor. Plans and request for service shall be evaluated based upon the demand flow generated, the base capacity of the system, and sizing that may be required by the proposed development or subdivision of land. Plan approvals or rejections shall specifically note the obligations of the owner, developer, or other parties regarding cost of sizing to meet generated demand flows. (Ord. 922, 2007: Ord. 832 (part), 2003)

13.12.040 Building sewer connection--Site plan.

Where property owners, or agents working in their behalf, apply for hookup to an existing sewer stub-out servicing a platted lot, the owner or his agents shall supply the city with confirmation regarding the location and elevations of the building sewer connection points at the building foundation. Location of the building sewer line, methods of connection and proposed materials including bedding and backfilling, shall be noted on the face of the building site plan. (Ord. 832 (part), 2003)

13.12.050 Call for inspection.

It shall be the responsibility of the permit holder (owner or agent) to request the inspection for hookup prior to connection or backfilling of ditches or connections. Failure to request and obtain on-site inspection prior to backfilling shall constitute grounds for denial of a certificate of occupancy for any structure requiring sewer service. The Mayor or his designee shall notify the Building Official in writing of the failure and request that certificate of occupancy be denied until compliance is obtained. The Mayor or his designee shall have the authority to insure that proper inspections are carried out prior to use of the system. This authority shall include directives for owners or their agents to uncover any sewer line or connection point backfilled or covered prior to final inspection by the city. (Ord. 832 (part), 2003)

13.12.070 Service calls.

The city assumes no responsibility for the adequacy, reliability or maintenance of the "building sewer." Blockage or other malfunctions of the building sewer shall be corrected by the property owner at his own expense. The maintenance crew will respond to complaint calls to determine if the problem is caused by or associated with the "service connection." If the problem is caused by or associated with the service connection, the city will make necessary repairs at no cost to the property owner. (Ord. 832 (part), 2003)

13.12.080 Extensions--Sewer mains.

Extensions of public sewer mains within the City of North Bonneville shall be built based upon plans and specifications developed by an engineer certified in the State of Washington. Upon completion, extensions shall be inspected and certified by a Washington State Engineer verifying that the work was completed according to the plan. (Ord. 832 (part), 2003)

13.12.090 Sewer extensions prohibited outside city.

No extension of the sewer system shall be made outside the municipal boundaries of the City of North Bonneville. (Ord. 832 (part), 2003)

13.12.100 Connection with public sewer required--Abandonment of private facilities.

At such time as State of Washington Health Standards cannot be met by the private sewage disposal system or a public sewer becomes available to a property served by a private sewage disposal system, a direct connection shall be made to the public sewer in compliance with this chapter. Any septic sewage disposal system not utilized for a six (6) month period shall be considered abandoned. Abandoned systems shall be pumped free of sewage. Tanks not constructed of concrete shall be removed or opened

and filled with soil or gravel at the owner's expense subject to the Health Department's regulation. (Ord. 832 (part), 2003)

13.12.110 Charges for sewer service charge--Levied and imposed.

There is levied and imposed upon the owner of any structure used for human occupancy, employment, recreation, or other purposes, situated on property within the City of North Bonneville and connected to the city sewer system, just and equitable charges for sewer service. Existing private or public septic systems established prior to October, 1977, shall be excluded from a mandatory connection to the city sewer system if State of Washington Health Standards can be met. Provided, however, that when property changes ownership it shall be mandatory that connection to the sewer system is made.

Failure to connect within sixty (60) days of written notice by the city, shall result in water shut off. All water turn off fees shall apply. (Ord. 832 (part), 2003)

13.12.115 Connection with public sewer required--Appeal procedure.

When required, connection to the public sewer shall be made either by gravity or with approved pumping facilities, in accordance with the provisions of this chapter, within ninety (90) days after the date of official notice to do so. In the event that, during such period of ninety (90) days, such owner files his written objections with the city against so being required to install such facilities, the provisions of this section shall not be enforced upon such owner until the City Council shall have, at a meeting thereof, heard such objections of such owner, and rendered its decision thereon. Such meeting shall be held not less than ten (10) days or more than forty-five (45) days after the date of the filing of such objections. Not less than seven (7) days prior to the date set for such meeting, the City Council shall give due notice of the date set therefore to such owner. The decision of the City Council shall be final and no appeal shall be taken therefrom by such owner except as is provided by law. (Ord. 832 (part), 2003)

13.12.120 Refusal to connect--Connection by city--Cost assessment--Lien.

If any owner or occupant fails, neglects or refuses to connect his lands, buildings, or premises with the public sewer within the time specified in the notice referred to in Section 13.12.115, or fails, neglects or refuses to do the other work specified and ordered to be done as provided in Section 13.12.115 within the time specified in the notice theretofore served upon such owner or occupant as provided in Section 13.12.115, the Utilities Manager shall make such connection or do such work. The cost of the connection or of such work done by the Utilities Manager shall be assessed against the property so connected or upon which such work is done. The amount of such cost shall become a lien upon the premises so connected or upon which the work is done. The city attorney is authorized, empowered and directed to collect the amount of the cost of such connection on the doing of such work, either by foreclosure of the lien or by a suit against the owner or occupant of the premises. Such suit shall be maintained in the name of the city as plaintiff, in any court of competent jurisdiction.

Failure to comply with Section 13.12.100 will result in the city performing the necessary procedure. Any costs incurred by the city shall be paid by the property owner. Failure to do so would constitute a lien being placed on the property according to this section. (Ord. 832 (part), 2003)

13.12.125 Dwellings served by pumping units.

Dwellings that are served by pumping units shall be subject to the sewer service charges provided by this chapter unless other charges for such dwellings are enacted by resolution of the City Council. (Ord. 832 (part), 2003)

13.12.130 Property owner responsible for charges.

The property owner shall be ultimately responsible for all sewer service charges to his property. If such charges are not paid, a lien will be placed on the property in accordance with Section 13.12.210. (Ord. 832 (part), 2003)

13.12.135 Rate schedule.

A. Base Rate.

The base rate for all customers shall be $20.00 multiplied by the number of units served, except for those discussed in subparagraphs 1 and 2 below.

1. The base rate for a lodging facility shall be $10.00 per unit.

2. There shall be no base rate for RV Parks that are not connected to the city's water system.

B. Consumption Charge.

In addition to the base rate, each customer shall pay $3.37 per 100 cubic feet of water consumption, payable in increments of 100 cubic feet or any portion thereof. Water consumption will be determined each year by averaging the customer's water meter reading during the months of November through February of the winter. This average monthly usage shall be applied to each customer's monthly bill until it is next updated. Average consumption shall be re-computed in March of each year.

1. Customers without previous history upon which to calculate an average consumption shall be charged according to the city-wide average consumption for their type of use (i.e. single family, multi-family, commercial) as of the preceding calculation.

2. For the purpose of calculation, customers who do not occupy their homes for any period in excess of one month between November 1st and March 1st shall be charged according to the city-wide average consumption for their type of use (i.e. single family, multi-family, commercial) as of the preceding calculation. If such residents notify the city of their absence, they shall be charged only the base rate during those months they are absent.

C. RV Parks.

RV Parks that are not connected to the city's water system shall provide the monthly accounting of the number of spaces available, occupied, and both occupied and lived in. To be counted as lived in space, an occupied space must only have been lived in 1 day during a given month. Such RV Parks shall be charged $30.00 for each space both occupied and lived in, the base rate of $20.00 for each space occupied and not lived in, and $8.04 per month for unoccupied spaces.

D. Annual Increase.

On March 1st of each year, this rate shall increase according to the Consumer Price Index for All Urban Consumers (CPI-U) as of August of the previous year, rounded to the nearest penny. (Ord. 982, 2011; Ord. 979, 2011; Ord. 873 (part), 2005; Ord. 832 (part), 2003)

13.12.140 Sewer connection fee--Levied and imposed.

A. There is levied and imposed upon the owner of any property connecting to the sanitary sewer system of the City of North Bonneville a connection fee. The service connection fee is levied upon a property based upon the existing or intended use of the property at the time of application for connection.

B. Dwellings that are served by pumping units shall be subject to the sewer connection fee provided by this chapter, unless other charges for such dwellings are enacted by the City Council. (Ord. 832 (part), 2003)

13.12.145 Sewer connection fees--Established--Payment due.

Sewer connection fees levied by this chapter shall be due at the time of issuance of a building permit and prior to connection to the system.

Sewer customers shall pay the actual construction cost required for installation of a service lateral to the owner's lot line or prorated share among adjacent ownerships, or trunk extension, if the services have not been previously provided. Additionally, the following connection fee shall be required:

Line Size	Connection Fee
4 inch	$ 4,500.00
6 inch	7,000.00
8 inch	10,000.00
10 inch	15,000.00
12 inch	25,000.00

At such time as the city has approved the service connection for use, the lot owner will be charged the minimum monthly rate as applicable to the lot or type of development. The owner shall be responsible for the cost required for installation of the service lateral from the main trunk line to the premises if the actual time/materials cost for the installation exceeds the minimum connection fee. A prorated share of the cost shall be paid if the main connection line is designed to serve more than one (1) ownership, by way of latecomer's agreement per RCW 35.91. All installations shall be reviewed and approved by the Public Utility Official of the city prior to construction.

Each unit, within a structure, connecting to the city sewer system within a commercial zone shall be charged the basic connection fee determined by sewer line size.

Each dwelling unit within a Multi-Family structure, connecting to the city sewer system, shall be charged the basic connection fee determined by sewer line size. (Ord. 922, 2007: Ord. 928, 2007: Ord. 908, 2006; Ord. 873 (part), 2005; Ord. 832 (part), 2003)

13.12.150 Appeals procedure.

A. Any owner or occupant aggrieved by a ruling under or interpretation of the provisions of this chapter may submit a written appeal to the City Council. The appeal shall set forth the events and circumstances leading to the appeal, the nature of the ruling or interpretation from which relief is sought, the nature of the impact of the ruling on appellant's property or business, together with any other reasons for the appeal.

B. The City Council will consider the appeal at the next regular council meeting or within thirty (30) days of receipt of the appeal, and hear testimony. The decision of the council will be final and no appeal shall be taken therefrom except as is provided by law. (Ord. 832 (part), 2003)

13.12.155 Payment.

Every person subject to a charge hereunder shall pay the same when due to the Clerk of the City of North Bonneville. (Ord. 832 (part), 2003)

13.12.160 Collection.

A. The Clerk of the City of North Bonneville is directed to collect the sewer service charges and connection fees as provided for herein.

B. Sewer service charges, when collected, shall be paid into a fund designated as the "sewer fund." Connection fees, when collected, shall be paid into a fund designated as the "sewer reserve fund."

C. The charges for sewer shall accrue monthly, and if not paid on or before 20 days after the date of billing, the charges shall be deemed to be delinquent and a notice of the delinquency shall be sent, allowing an additional 10 days to pay full amount due or make payment arrangements. (Ord. 982, 2011; Ord. 971, 2010; Ord. 832 (part), 2003)

13.12.165 Discharge provisions.

A. It is unlawful to discharge any wastewater or other polluted waters into any storm drain or natural outlet within the City of North Bonneville.

B. It is unlawful for any person to discharge or cause to be discharged any stormwater, groundwater, roof runoff, subsurface drainage, cooling water or unpolluted industrial process water to any sanitary sewer.

C. Stormwater, industrial cooling water, or unpolluted process waters may be discharged upon approval of the City of North Bonneville to a storm sewer. Such water shall not be discharged over a public walk or way into a storm sewer.

D. Except as hereinafter provided, no person shall discharge or cause to be discharged, any of the following described waters or wastes to any public sewer:

1. Any liquid or vapor having a temperature higher than one hundred forty (140) degrees Fahrenheit;

2. Any water or waste which may contain more than forty (40) parts per million by weight of animal or vegetable fat, oil or grease;

3. Any gasoline, benzene naphtha, fuel oil, or other flammable liquid, solid or gas, or other petroleum products and derivatives;

4. Any garbage that has not been properly shredded;

5. Any ashes, cinders, sand, mud, straw, shavings, metal, glass, rags, feathers, tar, plastics, wood, paunch manure, hair, bristles, or any other solid or viscous substance capable of causing obstruction to the flow in sewers or other interference with the proper operations of the sewer works;

6. Any waters or wastes having pH lower than five and one-half (5.5) or higher than nine (9) or having any other corrosive property capable of causing damage or hazard to sewer structures, equipment, personnel of the sewage works, or to be adversely active on sewage treatment processes;

7. Any waters or wastes containing suspended solids of such character and quantity that unusual attention or expense is required to handle such materials at the sewage treatment plant;

8. Any noxious or malodorous gas or substance capable of creating a public nuisance or hazard. (Ord. 832 (part), 2003)

13.12.170 Private septic systems.

A. Where the public sanitary sewer has not been provided adjacent to the property, the building sewer shall be connected to a private wastewater disposal system complying with the provisions of this chapter.

B. The type, capacities, location, and layout of a private wastewater disposal system shall comply with all recommendations of the Department of Public Health of the State of Washington. Copy of the approval shall be filed with the city.

C. The owner shall operate and maintain the private wastewater disposal facilities in a sanitary manner at all times at no expense to the City of North Bonneville. (Ord. 832 (part), 2003)

13.12.175 Discharge waste conforming to standards.

Any wastes that do not conform to standard sewage as herein defined shall be made to conform to the standards as set forth in this chapter by the person using the public sewer at his expense before discharging into the public sewer. The City of North Bonneville may, however, make a special agreement or arrangement between the city and any industrial concern whereby an industrial waste of unusual strength or character may be accepted by the city for treatment, subject to special payment, by the industrial concern, based upon the actual time and special expenses required. (Ord. 832 (part), 2003)

13.12.180 Discharge standards.

A. The admission into the public sewers of any waters or wastes having: (1) a five (5) day BOD greater than three hundred (300) parts per million by weight; (2) containing more than three hundred fifty (350) parts per million by weight of suspended solids, or six hundred (600) parts per million of total solids; (3) containing any quantity of substances having the characteristics described in Section 13.12.240(D) of this chapter; or (4) having an average daily flow greater than two (2) percent of the average daily sewage flow of the city shall not be allowed.

B. Where necessary in the opinion of the Public Utility Manager, the owner shall provide, at his own expense, such preliminary treatment as may be necessary to: (1) reduce the BOD to three hundred (300) parts per million by weight; (2) reduce objectionable characteristics or constituents to within the maximum allowable limits provided for in Section 13.12.240 of this chapter; or (3) control the quantities and rates of discharge of such waters or wastes. Plans and specifications and any other pertinent

information relating to the proposed preliminary treatment shall be submitted to the Utilities Manager and the Department of Ecology of the State of Washington for approval. (Ord. 832 (part), 2003)

13.12.185 Preliminary treatment.

Where preliminary treatment is provided for any waters or wastes, the treatment shall be maintained continuously in satisfactory and effective operation by the owner at his expense. (Ord. 832 (part), 2003)

13.12.190 Unlawful to damage or plug sewer system.

A. No unauthorized person shall uncover, make any connections with or opening into, use, alter, or disturb any public sewer or appurtenance thereof without first obtaining a written permit from the City of North Bonneville.

B. It is unlawful for any person to deposit garbage, rubbish, lead, animals, or any substance having a tendency to obstruct the flow of the sewer, in any manhole, lamp hole, flush tank or sewer opening.

C. It is unlawful for any person to break, damage, destroy, uncover, deface or tamper with any structure, appurtenance or equipment which is part of the system of sewerage. (Ord. 832 (part), 2003)

13.12.195 Inspectors--Powers and authority--Authorized.

A. The Public Utility Manager and other duly authorized employees of the city bearing power credentials and identification shall be permitted to enter all properties for the purposes of inspection, observation, measurement, sampling and testing in accordance with the provisions of this chapter.

B. The Public Utility Manager or his representatives shall have no authority to inquire into any processes including metallurgical, chemical, oil, refining, ceramic, paper, or other industries beyond that point having a direct bearing on the kind and source of discharge to the sewers or waterways or facilities for waste treatment. (Ord. 832 (part), 2003)

13.12.200 Inspectors--Powers and authority--Safety.

While performing the necessary work on private properties referred to above, the Public Utility Manager or duly authorized employees of the city shall observe all safety rules applicable to the premises established by the company and the company shall be held harmless for injury or death to the city employees and the city shall indemnify the company against loss or damage to its property by city employees and against liability claims and demands for personal injury or property damage asserted against the company and growing out of the gauging and sampling operation, except as such may be caused by negligence or failure of the company to maintain safe conditions as required by local, state and federal regulations. (Ord. 832 (part), 2003)

13.12.205 Inspectors--Powers and authority--Easements.

The Public Utility Manager and other duly authorized employees of the city bearing proper credentials and identifications shall be permitted to enter all private properties through which the city holds a duly negotiated easement for the purpose of, but not limited to, inspection, observation, measurement, sampling, repair and maintenance of any portion of the sewage works lying within the easement. All entry and subsequent work, if any, on the easement, shall be done in full accordance with the terms of the duly negotiated easement pertaining to the private property involved. (Ord. 832 (part), 2003)

13.12.210 Enforcement--Lien--Penalties and procedures.

A. The Clerk of the City of North Bonneville may use such means of collection as may be provided by the laws of the State of Washington or permitted by the Charter and ordinances of the City of North Bonneville.

B. Any delinquencies shall be levied against the property in the form of lien filed with the county of Skamania for the amount that is delinquent.

C. In the event it becomes necessary to file a lien, collection charges and interest charges established because of the nonpayment thereof shall be added to such charges together with a penalty in the amount of 10% along with all filing fees.

D. Discharge into the public sewer system of the City of North Bonneville of any septic tank waste or other substance not conforming to Sections 13.12.170 and 13.12.185 shall be subject to a fine in accordance with Section 7.01.020(E) for each infraction plus any cost that may have been incurred by the city including sampling, testing and time required for monitoring or correction of any effects caused by such discharge.

E. The Mayor or his/her designees shall be representatives of the City of North Bonneville to administer and enforce the terms of this chapter. (Ord. 982, 2011; Ord. 832 (part), 2003)

Chapter 13.20

SPECIAL PROVISIONS RESIDENCE CONSTRUCTED OVER LOT LINE

Sections:

13.20.010 Special rate provision.

If a residential dwelling is constructed over the common interior property line of two (2) contiguous lots, leaving less than eight thousand fifty (8,050) square feet (minimum allowable residential lot size) on either side, only one (1) charge for water service and one (1) charge for sewer service shall be assessed for the two (2) lots. (Ord. 635 § 1, 1989)

13.20.020 Legal owner, special rate allowed.

The charges for water and sewer services allowed under Section 13.20.010 of this chapter shall be available only for so long as the legal owner(s) of record for the two (2) lots is/are identical. (Ord. 635 § 2, 1989)

13.20.030 Lot size, special rate allowed.

If there is more than eight thousand fifty (8,050) square feet on either side of said residence (whether pursuant to a boundary line adjustment or otherwise) the provisions of Section 13.20.010 shall not apply and a separate water charge and a separate sewer charge shall be assessed for each of the lots, said separate charges to be effective as of the date of the issuance of a building permit for the additional dwelling. (Ord. 635 § 3, 1989)

Chapter 13.28

TELEVISION SYSTEM*

Sections:

* Prior ordinance history: Ords. 660, 684, 704 and 763.

13.28.010 Definitions.

"Additional CATV Service Levels" means any communications service in addition to basic CATV service provided by NB-CCTS.

"Basic service" means the availability of television services and radio signals at the point of delivery for use by the subscriber, irrespective of whether any or all television services are actually used.

"CATV" means a community antenna television system for the transmission of audio signals and/or visual images or other means of closed circuit transmission and/or signal transmission by means of electrical impulses within coaxial cable.

"City" means the City of North Bonneville, WA.

"North Bonneville Community Cable Television System (NB-CCTS)" means the name applied to the city-constructed, operated and maintained CATV system; which shall consist of a system of antenna, coaxial cables, wires, wave guides or other conductors, equipment or facilities designed, constructed or used for the purposes of providing broadcast and other signals by cable or through its facilities.

"Point of delivery" means the lot line point for each premise nearest the CATV pedestal for service distribution as outlined by NB-CCTS distribution plan.

"Premises" means a private home, building, apartment, condominium, trailer court space, mobile home park space, a group of adjacent buildings or property utilized under one (1) ownership and under a single control with respect to the use of NB-CCTS service and responsibility for payment therefore.

"Subscriber or customer" means any individual partnership, corporation or other entity supplied with television service by the North Bonneville Community Cable Television System (NB-CCTS).

"Transient facility" means a place where a person or persons, while passing through from one place to another, stops briefly (not over thirty (30) days) or overnight. (Ord. 827 (part), 2003)

13.28.020 Scope.

These terms and conditions are made a part of all oral or written contracts for delivery of television service. Copies of the terms and conditions shall be made available for inspection at all times in the North Bonneville City Hall. These terms and conditions shall also include contractual agreements by the city as an affiliate for service from the satellite program networks. (Ord. 827 (part), 2003)

13.28.030 Application for service.

Each prospective subscriber desiring television service shall be required to sign NB-CCTS standard form of application for basic TV services and any additional television service and file said application at the North Bonneville City Hall. This application reflects current channel line up and rates. (Ord. 827 (part), 2003)

13.28.040 Service policies.

NB-CCTS has extended energized trunk cable to substantially all the populated area throughout the city. However, the city is not obligated to extend its CATV service where, in its determination, it is not economically nor technically feasible to do so nor consistent with the City of North Bonneville policies and practices. (Ord. 827 (part), 2003)

13.28.050 Installation.

A. Existing Developments. The city shall bear the cost for repair and/or replacement of existing lines to the point of delivery to each premise. The city shall provide for and install the cable at cost to subscriber from point of delivery to the first initial outlet. Ditching and bedding services from the point of delivery to the initial outlet shall be provided by the city at cost to the subscriber. Any premise shall be prohibited from providing CATV service from NB-CCTS to any other premise.

B. New Developments. Cost of installation, including but not limited to, labor and materials actually expended in providing TV service to new developments within the city shall be the sole responsibility of the property owner/developer. Installation shall be performed by the city to the point of delivery.

C. Installation charge for the primary service line, shall be based upon the time and materials actually expended in providing television service from the point of delivery to the premises. Any additional outside wall outlets if installed by the city shall be at the rate of fifteen dollars ($15.00) for each single television or combination television and FM radio outlet. (Ord. 827 (part), 2003)

13.28.060 Cable service--Billing.

A. The billing rate shall be $34 per month per service. If not paid on or before the 20th day of the billing month said charges shall be deemed to be delinquent. Upon delinquency the city shall forthwith cut off and discontinue cable service until all the charges have been fully paid. An additional charge of $20.00 will be assessed upon the resumption of said service.

B. Rate schedules, terms and conditions, and channel lineup may be revised from time to time as deemed necessary by the city for continuous service.

C. The monthly rate schedule for any transient facilities such as motels, hotels and RV parks, will be prorated on a 50% occupancy rate with the rate schedule remaining the same as designated for all other uses. (Ord. 985, 2011; Ord. 982, 2011; Ord. 827 (part), 2003)

13.28.070 Connection fee.

A. Upon initial connection, a connection fee of $35 shall be charged for each subscriber. The said fee shall be payable to the City of North Bonneville in advance.

B. The subscriber may transfer a connection to another premise on the North Bonneville Community Cable Television System but the subscriber may not transfer connection to another party. (Ord. 985, 2011; Ord. 827 (part), 2003)

13.28.080 Voluntary request for termination of services.

Subscribers may terminate service. Subscribers desiring to terminate service must notify the city at least five (5) days prior the first of the month to avoid being charged for the upcoming month. Subscribers who give prior notice as stated above shall be refunded prepaid service following the current month. (Ord. 827 (part), 2003)

13.28.090 Unauthorized connections/ modifications prohibited.

No person shall make any connection, modification, alteration, or in any manner tap in, or attempt to tap into the North Bonneville Community Cable Television System, except as authorized by the Utility Manager of the City of North Bonneville, or his designated representative. No person shall use any receptacle, wire, amplifier, register, or other materials unless such materials are approved by Underwriters Laboratory in writing for use on cable television systems and unless said materials are expressly authorized by the Utility Manager of the City of North Bonneville for use on said cable TV system.

No person shall connect to the cable TV system in any manner unless an application for service is filed, all fees paid, or contracted, and the connection authorized by the Utility Manager, or his designated representative of the City of North Bonneville.

This city shall in no way be held responsible for improper or unauthorized connections. (Ord. 827 (part), 2003)

13.28.100 Penalties.

Any person found guilty of violating RCW 9A.56.220 as codified or hereafter amended, theft of cable service, shall be guilty of a gross misdemeanor punishable by a maximum of one (1) year in jail or by a fine of $5,000.00 or by both such imprisonment and fine. A person found guilty of violating any other section of this chapter shall be guilty of a civil infraction subject to a fine in accordance with Section 7.01.020(D) for each infraction. (Ord. 982, 2011; Ord. 827 (part), 2003)

Chapter 13.32

UTILITY EXTENSIONS OUTSIDE CITY PROHIBITED

Sections:

13.32.010 Purpose.

The City of North Bonneville owns and operates public utilities for the benefit and pleasure of its citizens.

Extension of municipal utilities outside the municipal corporate limits of North Bonneville directly benefits and promotes development outside the city limits; and are not in the best interest of the city. (Ord. 529 § II and III, 1983)

13.32.020 Extensions prohibited.

No extensions of municipal utilities shall be allowed outside the city limits of North Bonneville. (Also see Section 13.12.130) (Ord. 529 § IV, 1983)

13.32.030 Annexation requirement for extension.

Consideration of a utility extension request for service to any unincorporated adjacent land area must be accompanied by a petition for annexation to the City of North Bonneville. Favorable action may be taken only after processing and adoption to law. (Ord. 529 § V, 1983)

Chapter 13.36

SEPTIC TANK EFFLUENT PUMPING SYSTEMS

Sections:

13.36.010 Definitions.

Unless the context specifically indicates otherwise, the terms used in this chapter shall have the following meanings:

"City" means the City of North Bonneville.

"Control unit" means an electrical panel with pump switches that is mounted in an easily accessible location at each separate STEP service.

"Owner" means any individual, firm, partnership, corporation, company, association, or any other legal entity which holds title to property upon which a STEP system now or hereafter is located.

"Service box" means a utility box located at the property line that houses the valve and discharge line which run from the pump to the main sewage transmission line.

"Standard specifications" means those specifications and standards set forth in a manual entitled "City of North Bonneville, Septic Tank Effluent Pumping (STEP) System."

"STEP maintenance agreement and easement" means a agreement which provides that the owner will properly maintain the STEP system installed on his property, and which permits the City of North Bonneville to access an owner's property in order to inspect a STEP system and to maintain, repair or operate the system in the place and stead of the owner, if necessary, and to charge the owner therefor, including lien rights against the owner's subject property.

"STEP system" means a sanitary sewage system which utilizes a high head pump, alarms, and a control panel to pump waste from a collection tank into pressurized mainlines. (Ord. 724 § 1, 1995)

13.36.020 Standard specifications.

The City of North Bonneville STEP System packet, and the installation guide and drawings which are a part thereof, is adopted by reference and incorporated herein as the standard specifications for STEP sewer systems. (Ord. 724 § 2, 1995)

13.36.030 Application.

Any owner seeking to connect his property to the sanitary sewer system of the City by means of a STEP system shall file an application with the Public Works Department on a form provided by the City. The application shall contain the name and address of the owner, the location of the property to be connected to the sanitary sewer system, the nature of the structure constructed or to be constructed on the subject property, the proposed use of the subject property, the proposed location of the STEP system, the design of the STEP system, and such other information as the Public Works Department may require. Upon receipt of any such application, the Public Works Director, or his authorized designee, shall review the application and grant the same if he determines that the subject property is suitable for use of a STEP sanitary sewer system, and if the design, location and other information set forth in the application comply with the standards and specifications adopted by the City for STEP systems and the criteria set forth in this chapter. (Ord. 724 § 3, 1995)

13.36.040 Installation.

A. The individual owner shall be responsible for and shall pay for the installation of the STEP system, including but not limited to the tank, pump apparatus, control box, electrical wiring, conduit, plumbing from the structure to the tank, plumbing from the tank to the service box, excavation, and backfill material. The City shall, prior to installation, determine the appropriate size tank.

B. Following installation, the STEP system shall be inspected by the City to insure that it has been properly installed. There shall be a fee of fifty dollars ($50.00) for inspection of the STEP system, which fee shall be collected by the Building Department at the time the permit for connection to the municipal sewer system is issued. (Ord. 724 § 4, 1995)

13.36.050 STEP maintenance agreement and easement.

Any owner seeking to connect his property to the sanitary sewer system of the City of North Bonneville by means of a STEP system shall be required to execute a STEP maintenance agreement and easement substantially in the form attached to the ordinance codified in this chapter. The agreement shall require the owner to maintain the STEP or system at his sole expense, but shall authorize the City and its employees to have access to the owner's property for the purpose of inspecting the STEP system and

appurtenances thereto, and to maintain, repair or operate the system in the owner's place and stead, if necessary, and to charge the owner therefor, including lien rights against the owner's subject property. Such STEP maintenance agreement and easement shall be executed upon approval of an application for a STEP system, but prior to connection of the STEP system to the City's sanitary sewer system. (Ord. 724 § 5, 1995)

13.36.060 Ownership of system.

After inspection and acceptance of an installed STEP system, the City shall be the owner of all components of the STEP system with the exception of the sewer line from the structure to the tank, which shall be owned by the property owner. Ownership of the STEP system by the City notwithstanding, the owner will be responsible for maintaining the components of the STEP system, and in addition will be responsible for pumping the STEP tank and disposing of waste material when required. The owner will be responsible for maintaining the sewer line connecting the tank to the structure on the subject property. The owner will further be responsible for paying for all electrical costs associated with the operation of the STEP system. (Ord. 724 § 6, 1995)

13.36.070 Damage to STEP system.

The cost of repairing any damage to a STEP system which has resulted from the negligence, gross negligence or intentional acts of the owner shall be the responsibility of the owner. This responsibility includes any clogging which may result due to improper use of the STEP system by the owner. (Ord. 724 § 7, 1995)

APPENDIX L

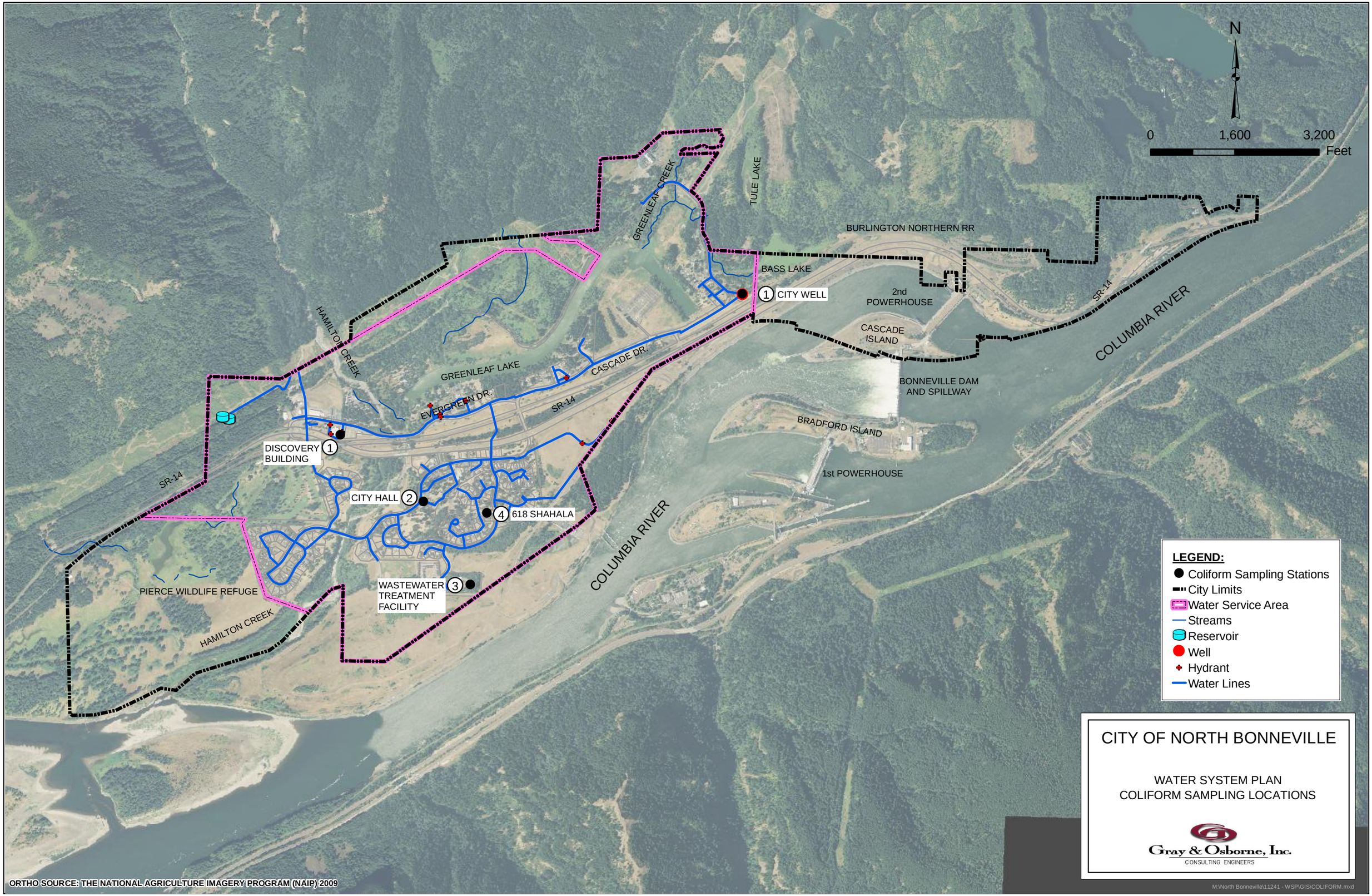
COLIFORM MONITORING PLAN

City of North Bonneville Coliform Monitoring Plan

The City of North Bonneville collects one sample per month for coliform bacteria testing. Sample locations are listed below and are shown on the attached map.

Name	Address	Months Sampled
Discovery Building	396 Evergreen Drive	January, June
City Hall	214 Cascade Mall Drive	April, July, November
Wastewater Treatment Plant	52 Whiskey Flats Road	March, August, December
Private Residence	618 Shahala	February, May, September
City Well	23 Roosevelt Street	October

Figure 6-1 in Chapter 6 of the Water System Plan, provides a protocol for notifications and retesting in the event of a positive sample.


N
0
1,600
3,200
Feet
GREENLEAF CREEK
TULE LAKE
BURLINGTON NORTHERN RR
BASS LAKE
1 CITY WELL
2nd POWERHOUSE
SR-14
COLUMBIA RIVER
CASCADE ISLAND
BONNEVILLE DAM AND SPILLWAY
BRADFORD ISLAND
1st POWERHOUSE
HAMILTON CREEK
GREENLEAF LAKE
CASCADE DR.
EVERGREEN DR.
SR-14
DISCOVERY BUILDING 1
CITY HALL 2
4 618 SHAHALA
WASTEWATER TREATMENT FACILITY 3
PIERCE WILDLIFE REFUGE
HAMILTON CREEK
COLUMBIA RIVER
LEGEND:
Coliform Sampling Stations
City Limits
Water Service Area
Streams
Reservoir
Well
Hydrant
Water Lines
CITY OF NORTH BONNEVILLE
WATER SYSTEM PLAN
COLIFORM SAMPLING LOCATIONS
Gray & Osborne, Inc.
CONSULTING ENGINEERS
ORTHO SOURCE: THE NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) 2009
M:\North Bonneville\11241 - WSP\GIS\COLIFORM.mxd

APPENDIX M

PRELIMINARY COST ESTIMATES

City of North Bonneville
Preliminary Project Cost Estimate
Source Improvement SO-6
Design & Construction of Additional Well Source

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM	$ 47,000	$ 47,000
2	8-inch PVC Water Pipe, Including Fittings	100 LF	$ 65	$ 6,500
3	Well Drilling[1]	LUMP SUM	$ 200,000	$ 200,000
4	CMU Well Building - 500 SF	LUMP SUM	$ 100,000	$ 100,000
5	600 gpm Pump	1 EA	$ 70,000	$ 70,000
6	Sodium Hypochlorite Disinfection System	LUMP SUM	$ 20,000	$ 20,000
7	Electrical	LUMP SUM TN	$ 75,000	$ 75,000
8	Connections to Existing System	1 EA	$ 1,500	$ 1,500
	Subtotal			$ 520,000
	Tax rate (7%)			36,400
	Subtotal:			$ 556,400
	Contingency (20%)			$ 111,600
	Total Estimated Construction Cost:			**$ 668,000**
	Engineering and Administrative Costs (25%):			$ 167,000
	Total Estimated Project Cost:			**$ 835,000**

City of North Bonneville
Preliminary Project Cost Estimate
Source Improvement SO-7
Well No. 1 Capacity Upgrade

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM	$ 8,000	$ 8,000
2	1,000 gpm Pump[1]	1 EA	$ 80,000	$ 80,000
	Subtotal			$ 88,000
	Tax rate (7%)			6,160
	Subtotal:			$ 94,160
	Contingency (20%)			$ 18,840
	Total Estimated Construction Cost:			**$ 113,000**
	Engineering and Administrative Costs (25%):			$ 28,000
	Total Estimated Project Cost:			**$ 141,000**

(1) Assumes no significant electrical upgrades are needed.

City of North Bonneville
Preliminary Project Cost Estimate
Source Improvement SO-8
Telemetry Upgrades for Existing Well

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM	$ 8,000	$ 8,000
2	Locate Existing Utilities	LUMP SUM	$ 700	$ 700
3	Telemetry Upgrades & Level Transducers[1]	1	$ 50,000	$ 50,000
	Subtotal			$ 58,700
	Tax rate (7%)			4,109
	Subtotal:			$ 62,800
	Contingency (20%)			$ 13,000
	Total Estimated Construction Cost:			**$ 75,800**
	Engineering and Administrative Costs (25%):			$ 19,000
	Total Estimated Project Cost:			**$ 95,000**

(1) Assumes radio telemetry

City of North Bonneville
Preliminary Project Cost Estimate
Storage System Improvement ST-1
Repaint Old Reservoir - Welded Steel

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM	$ 12,200	$ 12,200
2	Interior Repainting[1]	9,500 SF	$ 10	$ 95,000
3	Exterior Repainting[1]	5,300 SF	$ 5	$ 26,500

Subtotal	$ 133,700
Tax rate (7%)	9,360
Subtotal:	$ 143,060
Contingency (20%)	$ 28,600
Total Estimated Construction Cost:	**$ 171,660**
Engineering and Administrative Costs (25%)	$ 43,000
Total Estimated Project Cost:	**$ 215,000**

City of North Bonneville
Preliminary Project Cost Estimate
Metering Improvement M-1
Meter Replacement Program

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	3/4 inch Meters	145 EA	$ 125	$ 18,125
	Subtotal			$ 18,125
	Tax rate (7%)			1,269
	Subtotal:			$ 19,394
	Contingency (20%)			$ 3,900
	Total Estimated Project Cost:			**$ 23,300**

City of North Bonneville
Preliminary Project Cost Estimate
Distribution System Improvement D-3
Reservoir Transmission Main Replacement

NO.	ITEM	QUANTITY		UNIT PRICE	AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM		$ 34,000	$ 34,000
2	14-inch PVC Water Pipe, Including Fittings	2,700	LF	$ 100	$ 270,000
3	Locate Existing Utilities	LUMP SUM		$ 7,000	$ 7,000
4	Erosion Control	LUMP SUM		$ 7,000	$ 7,000
5	Additional Pipe Fittings	1,620	LB	$ 3.50	$ 5,670
6	Trench Safety Systems	LUMP SUM		$ 5,400	$ 5,400
7	14-inch Gate Valves	4	EA	$ 2,000	$ 8,000
8	Gravel Backfill	1,760	CY	$ 15	$ 26,400
9	Foundation Gravel	200	TN	$ 20	$ 4,000
10	Crushed Surfacing, Top Course	170	TN	$ 15	$ 2,550
11	Connections to Existing System	2	EA	$ 1,500	$ 3,000
12	Traffic Control	108	HRS	$ 35	$ 3,780
	Subtotal				$ 376,800
	Tax rate (7%)				26,376
	Subtotal:				$ 403,176
	Contingency (20%)				$ 80,824
	Total Estimated Construction Cost				**$ 484,000**
	Engineering and Administrative Costs (25%):				$ 121,000
	Total Estimated Project Cost				**$ 605,000**

City of North Bonneville
Preliminary Project Cost Estimate
Treatment Improvement TR-1
Sodium Hypochlorite Disinfection System

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM	$ 800	$ 800
2	Ventilation System	LUMP SUM	$ 3,000	$ 725
3	Electrical	LUMP SUM	$ 7,500	$ 750
4	Hypochlorite Equipment	LUMP SUM	$ 10,000	$ 7,000
	Subtotal			$ 9,275
	Tax rate (7%)			649
	Subtotal:			$ 10,000
	Contingency (20%)			$ 2,000
	Total Estimated Construction Cost:			**$ 12,000**
	Engineering and Administrative Costs (25%):			$ 3,000
	Total Estimated Project Cost:			**$ 15,000**

APPENDIX N

DOH DOCUMENTS

Water System Plan Submittal Form

This form is required to be submitted along with the Water System Plan (WSP). It will serve to expedite review and approval of your WSP. WSPs will not be reviewed until submittal form and checklist are completed.

City of North Bonneville	60150	City of North Bonneville
1. Water System Name	2. PWS ID# or Owner ID#	3. System Owner Name
John Spencer	509.427.8182	City Clerk
4. Contact Name for Utility	Phone Number	Title
PO BOX 7	North Bonneville	WA 98639
Contact Address	City	State Zip
Ken Alexander, PE	360.571.3350	Project Manager
5. Project Engineer	Phone Number	Title
8513 NE Hazel Dell Ave, Suite 106	Vancouver	WA 98665
Project Engineer Address	City	State Zip
6. Billing Contact Name (required if not the same as #4)	Billing Phone Number	Billing Fax Number
Billing Address	City	State Zip

6. How many services are presently connected to the system? 344
7. Is the system expanding? (seeking to extend service area or increase number of approved connections) ☐ Yes ☒ No
8. If number of services is expected to increase, how many new connections are proposed in the next six years? 142
9. If the system is private-for-profit, is it regulated by the State Utilities and Transportation Commission? ☐ Yes ☒ No
10. Is the system located in a Critical Water Supply Service Area (i.e., have a Coordinated Water System Plan)? ☐ Yes ☒ No
11. Is the system a customer of a wholesale water purveyor? ☐ Yes ☒ No
12. Will the system be pursuing additional water rights from the State Department of Ecology in the next twenty years? ☒ Yes ☐ No
13. Is the system proposing a new intertie? ☐ Yes ☒ No
14. Do you have projects currently under review by the Department of Health? ☐ Yes ☒ No
15. Are you requesting distribution main project report and construction document submittal exception, and if so, does the WSP contain standard construction specifications for distribution mains? ☐ Yes ☒ No
16. Are you requesting distribution related project report and construction document submittal exception, and if so, does the WSP contain distribution facilities design and construction standards, including internal engineering review procedures? ☐ Yes ☒ No
17. Have you sent copies of the draft WSP or notice to adjacent purveyors for their review? ☒ Yes ☐ No
18. Have you sent copies of the draft WSP to local governments with jurisdiction within your service area for their review? ☐ Yes ☒ No
19. Are you proposing a change in the place of use of your water right? ☒ Yes ☐ No

If answer to questions 17 and 18 is yes, list adjacent utilities/entities that have received a copy of the draft WSP: Skamania County, City of Skamania

Is this plan: ☐ an Initial Submittal ☒ a Revised Submittal

Please enclose the following number of copies of the WSP:

2 copies for Department of Health
1 copy for Department of Ecology
1 additional copy if you answered "yes" to question 9

3 Total copies attached

Please return completed form to the Office of Drinking Water regional office checked below.

☐ **Northwest Drinking Water Operations**
Department of Health
20435 72nd Ave. S, Ste 200
Kent, WA 98032-2358
(253) 395-6750

☒ **Southwest Drinking Water Operations**
Department of Health
PO Box 47823
Olympia, WA 98504-7823
(360) 236-3030

☐ **Eastern Drinking Water Operations**
Department of Health
1500 W. Fourth Ave, Suite 305
Spokane, WA 99201
(509) 456-3115

For persons with disabilities, this document is available on request in other formats. To submit a request, please call 1-800-525-0127 (TTY 1-800-833-6388).

Department of Health, Office of Drinking Water
Southwest Regional Office
Pre-Plan Agreement

Pre-Plan Date: 11/10/2011
Water System Name: North Bonneville
PWS #: 60150
Existing WSP expiration date: 9/17/2004
Operating Permit Color: GREEN
WSP Submittal Due Date: April 1, 2012

WAC 246-290-100 requires purveyors of any new water systems, a system in a water coordination act area, a system serving 1,000 or more service connections, or a system that is expanding or experiencing problems to submit a Water System Plan (WSP) and update their WSP every six (6) years. The purpose of this preplan meeting is to determine the scope and level of detail of the WSP or update and establish a schedule for submittal of the document. This agreement is valid until the WSP submittal due date above. After this date, the agreement will need to be renegotiated. The operating permit color will change to yellow if the WSP is not received by the WSP submittal due date noted above and no alternative submittal date has been established.

Pre-Plan Attendees: **Ray Hayes- City of North Bonneville, John Spencer- City of North Bonneville, Ken Alexander- Gray & Osborne, Inc., Mallory Taylor- Gray & Osborne, Inc., Jozsef Bezovics- DOH, Darin Klein-DOH**

Water System Plan (WSP) Checklist for City of North Bonneville

	√ *Required*	*Content Description*	*WSP Page #*
	(√)	**Water System Plan Submittal Form/ Updated and Signed WFI**	*Appendix N & A*
Chapter 1		**Description of Water System**	
	(√)	Ownership and management	1-2
	(√)	System history and background	1-2
	(√)	Brief inventory of existing facilities	1-6
	(√)	Description of and discussion about related plans: CWSP, ground water management, basin and City/County land use plans & zoning. Include land use maps for 6 & 20-years	1-10, Figure 1-4
	(√)	Service area characteristics, agreements, & policies including conditions of service and how new service will be provided in the retail service area. Include maps for water rights service area & for existing, future & retail service areas-Clearly identify your service areas on the map.	1-3, Figure 1-3
	(√)	Duty to serve statement for the retail service area	1-2
	(√)	Local Government Consistency from planning agencies(Skamania County)	Appendix N

Chapter 2		**Basic Planning Data**	
	(√)	Current data: population, service connections & ERUs	2-1, 2-5
	(√)	Data Collection: Monthly and annual production totals per source including purchased water Annual usage by customer class Annual usage for water supplied to other systems-NONE	2-3, 2-4
	(√)	6 & 20 year service area projections for: Land use Zoning Population, service connections & ERUs Water demand - use WAC 246-290-221 and include demands with and without expected efficiency savings	2-7, 2-8, 2-9, 2-10, 4-7
	(√)	DSL percentage and volume (provide discussion in Chapter 4)	2-6
Chapter 3		System Analysis	
	(√)	System design standards (fire flow, system pressures, etc.)	3-16
	(√)	System inventory, description and analysis	3-17
	(√)	Source	3-18
	(√)	Storage	3-24
	(√)	Distribution system/hydraulics (with equalization & FFS depleted)	3-28
	(√)	Add pressure zones	NA
	(√)	Treatment	3-25
	(√)	Written legal & physical system capacity analysis & DOH Capacity & ERU Determinations (WSDM 6-1) forms	3-33
	(√)	Water quality analysis	3-1
	(√)	Summary of system deficiencies	3-32
	(√)	**Analysis of possible improvement projects**	3-30
Chapter 4		**Water Resource Analysis & Water Use Efficiency (WUE)**	
	(√)	**Metering Program** • Description of all source meters (existing and new sources) **what are you doing to fix that source meter?** • Description of service meter program included how all meters are operated and maintained, include schedule & in the budget • Describe activities to minimize leakage	4-5, 4-9

	(√)	**Water Use Efficiency Program (WUE)** A WUE program should be designed to achieve the WUE goal by implementing cost effective measures per WAC 246-290-810**(Refer to Water Use Efficiency guide on DOH website)** • Describe the current conservation (WUE) program • Describe WUE goal & document public adoption process • Describe measures that will be implemented to achieve the goal & include schedule & costs in the budget • Describe process used to evaluate the WUE measures you did not implement • Describe yearly consumer education • Estimate projected water savings from selected measures • Describe process that will be used to determine effectiveness of the program	4-5
	(√)	**Distribution System Leakage (DSL) 35%, 3yr Avg 21.6%** Evaluate and report DSL - WAC 246-290-820(2)	2-6
	(√)	**Water loss control action plan (WLCAP)** Submit the WLCAP as required by WAC 246-290-820(4)-**What is your plan to control water loss?**	4-7
	(√)	**Source of supply analysis:** • Evaluate water supply alternatives if additional water rights will be pursued within 20 years • Describe water supply characteristics & discuss any foreseeable impact (quantity & quality) to the resource (WAC 246-290-100 (4)(f) (ii) (B))	3-19
	(√)	**Water rights self-assessment: Consult with Ecology regarding water rights if you have questions** Put all water right information together in Chapter 4. 1) Water right self-assessment forms: existing, 6 & 20 year 2) Description of water right status 3) Legal description from water right 4) Copies of water right certificate(s) 5) Well log & USGS map with point of withdrawal/diversion & place of use	Appendix B
	(√)	Water supply reliability analysis	3-31
Chapter 5		**Source Water Protection**	
	(√)	Wellhead protection program or **2 year update (updated inventory, letters, and map) per WAC 246-290-135**	5-1, Figure 5-1, 5-11
Chapter 6		**Operation and Maintenance Program**	
	(√)	Water system management and personnel	6-1
	(√)	Operator certification	6-2
	(√)	Routine operating procedures and preventive maintenance	6-3
	(√)	Water quality sampling procedures & program	3-3, Appendix D
	(√)	Coliform monitoring plan and map	Appendix L
	(√)	Emergency Response program	6-6

	(√)	Recordkeeping, reporting, and customer complaint program	6-11, Appendix H
	(√)	Summary of O&M deficiencies, include cost in budget	7-1
Chapter 7		**Distribution Facilities Design and Construction Standards**	
	(√)	Standard construction specifications for distribution mains	3-1
	(√)	Design and construction standards for distribution-related projects	3-1
Chapter 8		**Improvement Program**	
	(√)	Capital improvement program including 6-year CIP schedule-**All projects you are considering**	7-6
Chapter 9		**Financial Program**	
		A financial program to demonstrate financial viability:	
	(√)	Summary of past income and expenses- Last 6 years	8-2
	(√)	Balanced 6-year operational budget including a financial viability test	8-4
	(√)	Plan for collecting the revenue necessary to maintain cash flow stability and to fund capital and emergency improvements	8-3
	(√)	Rate structure evaluation that considers: • Affordability of water rates • Feasibility of implementing rate structure that encourages water demand efficiency	8-1
Chapter 10		**Miscellaneous Documents**	
	(√)	Informational meeting for the consumers, include notification and minutes	Appendix N
	(√)	Attach notice to adjacent utilities that WSP is available for review & comment.	Appendix N
	(√)	When DOH is ready to approve the final WSP, the plan must be adopted by the governing body; include meeting minutes.	TBD

***All maps should be a minimum of 11”x17”**
***If requesting source approval with WSP include all source documents in a separate section. Source approval will not be requested in this WSP.**

Miscellaneous Items

1. **Three (3) copies of the WSP are required – two for ODW use and one to be routed to the Department of Ecology (Ecology).**
    - **Three-ring binders are preferable to comb binders as it allows for page revisions to be added in the draft.**
2. **The water system is required to transmit a copy of the WSP to local governments (Skamania County): and adjacent purveyors (NONE).**

3. **Community water systems are required to hold an information meeting for customers prior to approval of the WSP.**

ODW expects that the water system take ownership of the WSP. A WSP written as if from a third party consultant making recommendations to the water system is not acceptable. The WSP must describe what the water system intends to do in the 6 and 20 year planning period.

Local Government Consistency Review Checklist

Water System Name: City of North Bonneville PWS ID: 60150

Planning/Engineering Document Title: Water System Plan Plan Date: September 2012

Local Government with Jurisdiction: Skamania County

WAC 246-290-108 Consistency with local plans and regulations:
Consistency with local plans and regulations applies to planning and engineering documents under WAC 246-290-106, 246-290-107, and 246-290-110(4)(b (ii).

1) Municipal water suppliers must include a consistency review and supporting documentation in its planning or engineering document describing how it has addressed consistency with **local plans and regulations.** This review must include specific elements of local plans and regulations, as they reasonably relate to water service as determined by Department of Health (DOH). Complete the table below and see instructions on back.

Local Government Consistency Statement	Page(s) in Planning Document	Yes – No – Not Applicable
a) The water system service area is consistent with the adopted land use and zoning within the applicable service area.	Figure 1-3 and 1-4	N/A for County
b) The six-year growth projection used to forecast water demand is consistent with the adopted city/county's population growth projections. If a different growth projection is used, provide an explanation of the alternative growth projection and methodology.	pg 2-8	N/A for County
c) Applies to cities and towns that provide water service: All water service area policies of the city or town are consistent with the utility service extension ordinances of the city or town.	Appendix K	N/A for County
d) Service area policies for new service connections are consistent with the adopted local plans and adopted development regulations of all jurisdictions with authority over the service area [City(ies), County(ies)].	Appendix K	N/A for County
e) Other relevant elements related to water supply are addressed in the water system plan, if applicable; Coordinated Water System plans, Regional Wastewater plans, Groundwater Area Management plans, and Capital Facilities Element of Comprehensive plans.	Pg 1-10	N/A for County

I certify that the above statements are true to the best of my knowledge and that these specific elements are consistent with adopted local plans and development regulations. Entire Wtr system is inside NB City Limits – none located w/I County Jurisdiction KW

Signature

9/27/12
Date

Karen Witherspoon, Director, Skamania County Community Development Department
Printed Name, Title, & Jurisdiction

City of Stevenson
Public Works Department

(509)427-5970

7121 E Loop Road, PO Box 371
Stevenson, Washington 98648

TO: John Spencer, City Administrator, City of North Bonneville
Ken Alexander, Project Manager, Gray & Osborne, Inc.

FROM: Eric Hansen, Public Works Director

DATE: December 12th, 2012

SUBJECT: Water System Plan Review

Mr. Spencer,

The City of Stevenson has reviewed the 2012 Water System Plan Update in draft form for the City of North Bonneville and has no comments at this time. We reviewed for overlap of service area and watershed resource area. Furthermore, we acknowledge that the longstanding cooperation of emergency assistance between our utilities will continue.

Thank you for allowing us to make our review.

WSP Notice from Skamania County Pioneer, September 19, 2012

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in the manner as provided in RCW 11.40.070 by serving on or mailing to the personal representative or the personal representative's attorney at the address stated below a copy of the claim and filing the original of the claim with the court. The claim must be presented within the later of: (1) Thirty days after the personal representative served or mailed the notice to the creditor as provided under RCW 11.40.020(3); or (2) four months after the date of first publication of the notice. If the claim is not presented within this time frame, the claim is forever barred, except as otherwise provided in RCW 11.40.051 and 11.40.060. This bar is effective as to claims against both the decedent's probate and nonprobate assets.

DATE OF FILING COPY OF NOTICE TO CREDITORS WITH CLERK OF THE COURT: 9/6/12

DATE OF FIRST PUBLICATION: 9/12/12

MELISSA C. MAYO, Personal Representative
c/o JILL R. KURTZ, Attorney for the Estate
JACKSON, JACKSON, & KURTZ, INC., P.S.
P.O. Box 340
Battle Ground, WA 98604
Phone: (360) 687-7106 FAX: (360) 687-3121

Publ: Sept. 12, 19 & 26, 2012 (13090)

NOTICE

NOTICE OF DETERMINATION OF NONSIGNIFICANCE

The Washington State Department of Transportation (WSDOT) has issued a determination of non-significance (DNS) under the State Environmental Policy Act Rules (Chapter 192-11 WAC) for the following project: SR 14 Culvert Rehabilitation Project. The project is located on State Route (SR) 14 at Milepost (MP) 41.47. Project limits are located within DLC 27, Township 2N, Range 7E, Willamette

The public is invited to comment on this DNS by submitting written comments no later than September 28, 2012 to Barb Aberle, Environmental Services Manager, Washington State Department of Transportation, PO Box 1709, Vancouver, WA 98668-1709.
Publ: Sept. 12 & 19, 2012 (13092)

NOTICE

NOTICE OF PUBLIC HEARING
Before the
City of North Bonneville Council

Purpose:
The City of North Bonneville hereby gives notice that a public hearing will be held to consider Resolution 449, Adoption of the Water System Plan.

Written testimony and comments to be considered at the public hearing by the City of North Bonneville Council must be received by the City Clerk/Treasurer by 12:00 PM on the Friday preceding the date of the public hearing.

Copies of the Water System Plan and Resolution 449 are available to the public at the North Bonneville City Hall, 214 CBD Drive, North Bonneville, WA.

Date: September 25, 2012
Time: 7:00 PM
Place: North Bonneville City Hall
214 CBD Drive
North Bonneville, WA

The North Bonneville City Hall is accessible to persons with disabilities. Please let us know if you will need any special accommodations in order to attend the meeting. (509) 427-8182.

Dated this 10th day of September, 2012.

John Spencer
Administrator/Clerk/Treasurer
Publ: Sept. 19, 2012 (13093)

NOTICE

NOTICE OF TRUSTEED SALE Pursuant to the Revised Code of Washington 61.24, et seq. TS No.: WA-11 -451277-SH APN No.: 02-05-33-3-2-0500-00 Title Order No.: 5562504 Grantor(s): NINA L WILSON Grantee(s): MORTGAGE ELECTRONIC REGISTRATION SYSTEMS, INC., ("MERS"), AS NOMINEE FOR AMERICAN HOME MORTGAGE ACCEPTANCE, INC Deed of Trust Instrument/Reference No.: 2007166828 I. NOTICE IS HEREBY GIVEN that Quality Loan Service Corp. of Washington, the undersigned Trustee, will on 10/19/2012, at 10:00 AM At the main entrance to the Skamania County Courthouse, 240 Vancouver Ave., Stevenson, WA 98648 sell at public auction to the highest and best bidder, payable in the form of credit bid or cash bid in the form of cashier's check or certified checks from federally or State chartered banks, at the time of sale the following described real property, situated in the County of SKAMANIA, State of Washington, to-wit: PARCEL I THAT PORTION OF LOTS 15,16 AND 17, PREACHER'S ROW LOTS, ACCORDING TO THE OFFICIAL PLAT THEREOF ON FILE IN THE OFFICE OF THE AUDITOR OF SKAMANIA COUNTY, WASHINGTON, LYING SOUTHEASTERLY OF THE SOUTHERLY RIGHT OF WAY LINE OF THE COUNTY ROAD KNOWN AND DESIGNATED AS THE SALMON FALLS ROAD. PARCEL II A PARCEL OF PROPERTY LYING WITH SECTION 33, TOWNSHIP 2 NORTH, RANGE 5 EAST OF THE WILLAMETTE MERIDIAN, SKAMANIA COUNTY, WASHINGTON, DESCRIBED AS FOLLOWS: COMMENCING AT THE SOUTHWEST CORNER OF THE NORTHWEST QUARTER OF SAID SECTION 33 AS SHOWN IN A SURVEY

BLUFF ABOVE THE WASHOUGAL RIVER; THENCE SOUTH 52 DEGREES 17'20" WEST ALONG THE BLUFF A DISTANCE OF 54 FEET; THENCE NORTH 47 DEGREES 42'40" WEST 60 FEET TO THE POINT OF BEGINNING. More commonly known as: 11472 WASHOUGAL RIVER ROAD, WASHOUGAL, WA 98671 which is subject to that certain Deed of Trust dated 7/2/2007, recorded 7/10/2007, under 2007166828 records of SKAMANIA County, Washington, from NINA L WILSON, as Grantors), to STEWART TITLE, as Trustee, to secure an obligation in favor of MORTGAGE ELECTRONIC REGISTRATION SYSTEMS, INC., ("MERS"), AS NOMINEE FOR AMERICAN HOME MORTGAGE ACCEPTANCE, INC, as Beneficiary, the beneficial interest in which was assigned by MORTGAGE ELECTRONIC REGISTRATION SYSTEMS, INC., ("MERS"), AS NOMINEE FOR AMERICAN HOME MORTGAGE ACCEPTANCE, INC (or by its successors-in-interest and/or assigns, if any), to Nationstar Mortgage LLC . II. No action commenced by the Beneficiary of the Deed of Trust is now pending to seek satisfaction of the obligation in any Court by reason of the Borrower's or Grantor's default on the obligation secured by the Deed of Trust/Mortgage. III. The default(s) for which this foreclosure is made is/are as follows: Failure to pay when due the following amounts which are now in arrears: $32,163.97 IV. The sum owing on the obligation secured by the Deed of Trust is: The principal sum of $260,356.32, together with interest as provided in the Note from the 9/1/2010, and such other costs and fees as are provided by statute. V. The above-described real property will be sold to satisfy the expense of sale and the obligation secured by the Deed of Trust as provided by statute. Said sale will be made without warranty, ex-

WSP Notice from Skamania County Pioneer, October 3, 2012

833-6388) if you require special accommodations, including handicap accessibility or interpreter services, to attend the hearing.

Publ: Sept. 26 & Oct. 3, 2012 (13110)

NOTICE

The foregoing ordinance has been summarized to reduce the cost of publication. The full ordinance can be viewed at the North Bonneville City Hall during our normal business hours, Monday through Friday from 8:00am to 5:00pm. Any questions may be directed to Mayor Don Stevens at (509) 427-8182.

CITY OF NORTH BONNEVILLE
ORDINANCE NO. 1011

AN ORDINANCE OF THE CITY OF NORTH BONNEVILLE AMENDING NORTH BONNEVILLE MUNICIPAL CODE ADDING A NEW CHAPTER 5.06 MOBILE AND ITINERANT VENDORS.

This ordinance allows for mobile and itinerant vendors to do business within the city's central business district in limited circumstances.

This ordinance was passed by the city council on September 26th, 2012 and shall take effect five days after publication.
Publ: Oct. 3, 2012 (13111)

NOTICE

The foregoing ordinance has been summarized to reduce the cost of publication. The full ordinance can be viewed at the North Bonneville City Hall during our normal business hours, Monday through Friday from 8:00am to 5:00pm. Any questions may be directed to Mayor Don Stevens at (509) 427-8182.

CITY OF NORTH BONNEVILLE

The North Bonneville City Hall is accessible to persons with disabilities. Please let us know if you will need any special accommodations in order to attend the meeting. (509) 427-8182.

Dated this 27th day of September, 2012.

John Spencer
Administrator/Clerk/Treasurer
Publ: Oct. 3, 2012 (13113)

NOTICE

NOTICE OF PUBLIC HEARING
Before the
City of North Bonneville Council

Purpose:
The City of North Bonneville hereby gives notice that a public hearing will be held to consider Resolution 449, Adoption of the Water System Plan.

Written testimony and comments to be considered at the public hearing by the City of North Bonneville Council must be received by the City Clerk/Treasurer by 12:00 PM on the Friday preceding the date of the public hearing.

Copies of the Water System Plan and Resolution 449 are available to the public at the North Bonneville City Hall, 214 CBD Drive, North Bonneville, WA.

Date: October 9, 2012
Time: 7:00 PM
Place: North Bonneville City Hall
214 CBD Drive
North Bonneville, WA
The North Bonneville City Hall is accessible to persons with disabilities. Please let us know if you will need any special accommodations in order to attend the meeting. (509) 427-8182.
Dated this 27th day of September, 2012.
John Spencer
Administrator/Clerk/Treasurer
Publ: Oct. 3, 2012 (13114)

Woodland

Stevenson posted 2 shots on goal one by Cara Sharp and one by Nica Pinson.

Goalkeeper Summer Koering saved 11 out of 22. The final score was 11-0 Woodland

Player of the Match: "This match we'd like to to spot light Katie Pyland. Katie is a junior and this is her first year playing varsity soccer. Katie typically plays defense how-

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By SC Community Health

Washington State's Division of Behavioral Health and Recovery (DBHR) has approved an inter-local agreement between Clark, Cowlitz and Skamania counties to combine administration and coordination of the region's public mental health services. The new entity commenced operation on Monday, Oct. 1, and is called the Southwest Washington Behavioral Health Regional Support Network.

The state proposed in November 2011 to reduce the number of Regional Support Networks (RSNs) across the state from 13 to six as a way to save the state money and to prepare for health care reform. The state legislature then passed House Bill 2139 calling for RSNs to be reduced on a voluntary basis and without having to compete with private entities.

Clark and Cowlitz County RSNs, along with Skamania County, determined it would be in the best interest of con-

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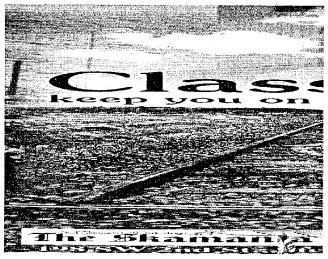

MEMORANDUM TO: Office of Drinking Water, Department of Health, State of Washington

MEMORANDUM FROM: City of North Bonneville, Washington

SUBJECT: Public Meetings on Draft Water System Plan

1. The City of North Bonneville published in the Skamania County Pioneer newspaper on September 19, 2012 and October 3, 2012 Notices of Public Hearings for the purpose of considering a resolution to adopt the Water System Plan. These hearings were held on September 26, 2012 and October 9, 2012 during the regularly scheduled City Council meetings at 7:00 p.m.
2. Several comments were received at these City Council meetings.
    a. From September 26, 2012

    <u>Resolution 449 – Adoption of Water System Plan</u>

    John noted that we don't need to adopt the plan tonight. The State Department of Health will review the plan and provide comments that we can incorporate before final approval.

    Quincy Anderson – Asked whether the council has read through the entire plan, and expressed concern about various portions of the plan, particularly Fluoride and Chlorine use and citizen education.

    Jim Runkles – Noted that he has read the entire plan in his volunteer capacity and that there is nothing in it regarding Fluoride. He stated that it is well written and includes plans for future improvements.

    Cheryl Jermann – Asked whether the plan will result in additional rate increases.

    Quincy Anderson – Noted that the plan notes an annual fee increase.

    Jim Runkles – Noted the plan calls for an annual rate increase, which was approved when he was on council. The education portion is simply to make people aware of water saving measures.

    Mayor Stevens responded to citizen questions and John provided additional background on the water conservation components of the plan.

    b. From October 9, 2012

    <u>Resolution 449 – Water System Plan</u>

    Quincy Anderson – Asked whether the council has read the plan and recommended that they do so. She stated that the plan would restrict citizen's property rights and that the plan requires continued rate increases. She questioned whether it is appropriate for the city to educate citizens on water conservation.

    Michael Hamilton – Suggested that the council should not pass the plan without reading it in its entirety. He also complained the water rates are too high.

    Jim Runkles – Noted that he read the plan and pointed out that requirements for metering water and educating the public come from the state. He also noted that the rate increases discussed in the plan were approved by a previous council.

    Quincy Anderson – Discussed water leakage requirements, asked why the Shoreline plan is mentioned in the water system plan, noted that 2007 sample results allow for a maximum

level of fluoride in the water, noted that the city was granted a waiver on asbestos testing and asked why the city requested it, asked whether the plan requires additional chlorine, and suggested that a section regarding irrigation be stricken from the document.

Robert Bianchi – Noted that many of the issues raised during the hearing so far are state, not federal, requirements and recommendations.

Judy Nappe – Asked whether copies of the plan are available.

c. From October 23, 2012

Public Comment

Katie Walker – Spoke about the proposed water plan, asking numerous questions about details of the plan. She urged the council against making hasty decisions regarding this plan and urged the city to consider other financing options for the water system. She provided a written version of her comments, which are attached.

Quincy Anderson – Discussed her views regarding the city's draft water system plan and regarding actions of the United Nations. She presented related documents to the council

3. The questions asked by Ms. Walker (above) were answered below.

Responses to questions addressed by Katie Walker

Q. Table 4-2 creates a red flag, which states, "Reduce the customer consumption by 10% over the 20-year period." I am confused how will this be implemented?

A. Table 4-2 refers to DSL (Distribution System Losses). The system currently loses 34.1%. The goal is to reduce the loss of (or unaccounted for) water to 10%. This has nothing to do with property rights. We hope to correct much of the water loss through meter replacement and by repairing any leaks in transmission pipes.

Q. Table 2-11 seems to be a scare tactic by projecting our community's numbers to increase 1,353 in population growth. In the past 7 years we have only grown at a max of 100 or so occupants. This number seems extremely off.

A. While this does seem high, it should be noted that this is just an estimate. The original WSP produced in 1998 projected the population in 2012 to be 849. In reality we now have 1000. When planning it is always better to plan for more than enough than not enough.

Q. Table 2-10 showing the build out population to max out in the year 2017, to 2875 where Stevenson alone is at 1,473 in 2011, this number with no foreseeable business growth in our town looks to be a miss hope and a way of manipulating the water "plan". With an annual growth of 5.2% the numbers do not add up.

A. These numbers are estimates based upon past growth rates. Starting with the population of 965 in 2011 and multiplying this by 4.35% each year (see the paragraph on page 2-

7 explaining the reasoning for the use of 4.35%) the numbers in Table 2-10 are accurate. Again, these are estimates used for projection purposes.

Q. Why does the city wish to convert from chlorine gas to liquid sodium hypochlorite especially when disinfection is not required?

A. The city, as a supplier of public drinking water, must comply with standards established by the Federal Safe Drinking Water Act which includes disinfection (see WAC246-290-451). The city has been using chlorine gas which is toxic and poses dangers to the public and operations staff. Liquid sodium hypochlorite has the same efficacy and residual protection as chlorine gas but is safer to handle.

Q. Table 3-2: Does it mean that the fluoride level will be 4.0 if this plan is voted in to existence and can you explain the rest of the table standards?

A. Table 3-2 lists the Maximum Contaminant Levels (MCL) for each of the chemicals listed. MCL's are the minimum standards for water quality as established by WAC 246-290-310. For Fluoride the maximum contaminant level is 4.0 milligrams per liter. This does not say that the city is adding Fluoride to the water. This is only establishing a maximum level should fluoride be present.

Q. It says in the plan, "The City has adequate storage for the 6- and 20-year planning periods with the two existing reservoirs." If this is true then why is this plan being approached?

A. The Water System Plan was first written and approved in 1998. The current version is simply an update of this plan. When first written the city had only one reservoir. By planning appropriately, we were able to have a second reservoir constructed providing adequate and redundant storage. The WSP also covers a number of other factors including pumping capacity. We are also updating this plan because state law requires us to do so.

Q. As shown in Table 1, the City has water rights totaling 1,000 gallons per minute (gpm) based on instantaneous withdrawal. Our projected maximum withdraw is stated at 445 gpm. With this being said we are half the capacity. Is this an emergency at the moment or can it be viewed in a sinking fund approach?

A. While you are correct that the city has water rights totaling 1000 gpm, our pump is only capable of pumping 600 gpm. Using the estimated demand in Table 2-13, we will not have enough volume by 2017. Given that the construction of an additional well is costly and time consuming, there is not enough time nor available funds to use a "sinking fund approach". Further we need a second well as a backup in case the existing well ever fails. While this is not currently an emergency, we are trying to avoid one.

Q. Table E-11 shows "Meter Replacement Program," Will this be residential meters and is this a need at the moments?

A. We were unable to locate the referenced Table E-11. The Meter Replacement Program is located in Chapter 7, Capital Improvement Program. The city has a number of meters, both residential and commercial. These need to be replaced as they fail. At this moment, the city

does not have any replacement meters on hand in case a meter does fail. The average life of a meter is around 10-12 years. With this in mind, we should keep an active replacement program going.

Q. In table 6-2 who is the head utilities manager and why are they not listed?

A. The head utilities manager is now Bryan Hendrickson. At the time of the printing of this "draft" revision to the WSP, the position was vacant following the retirement of the previous head utilities manager.

4. Should you have any questions concerning this Memorandum, please contact the undersigned.

John Spencer

City Administrator
City of North Bonneville

McElfresh, (509) 427-3910, E-mail diane@co.skamania.wa.us
The Skamania County Public Works Department will receive statements for qualification in the Courthouse Annex, until 5:30 pm on Thursday, March 7, 2013.
Publ: Feb. 6, 2013 (13216)

NOTICES

NOTICE OF PUBLIC HEARING
Before the
City of North Bonneville Council

Purpose: The City of North Bonneville hereby gives notice that a public hearing will be held to consider the city's Water Use Efficiency Program and Resolution Number 453, Water Use Efficiency Program.

Written testimony and comments to be considered at the public hearing by the City of North Bonneville Council must be received by the City Clerk/ Treasurer by 12:00 PM on the Friday preceding the date of the public hearing.

Copies of Resolution 454 are available to the public at the North Bonneville City Hall, 214 CBD Drive, North Bonneville, WA.

Date: February 12, 2013
Time: 7:00 PM
Place: North Bonneville City Hall
214 CBD Drive
North Bonneville, WA

The North Bonneville City Hall is accessible to persons with disabilities. Please let us know if you will need any special accommodations in order to attend the meeting. (509) 427-8182.

Dated this 30th day of January, 2013.

John Spencer
Administrator/Clerk/Treasurer
Publ: Feb. 6, 2013 (13217)

BONNEVILLE
ORDINANCE NO. 1019

AN ORDINANCE OF THE CITY OF NORTH BONNEVILLE, WASHINGTON Amending NORTH BONNEVILLE MUNICIPAL CODE Title 9 and 20 AND Adopting chapter 12.14 SIGNAGE ON CITY RIGHT OF WAYS.

This ordinance requires people to obtain permits from the city before erecting signs in the city's right-of-ways.

This ordinance was passed by the city council on January 22nd, 2013 and shall take effect five days after publication.
Publ: Feb. 6, 2013 (13219)

NOTICES

City of Stevenson
Notice of Public Hearing
Planning Commission Meeting

Please be advised that the Stevenson Planning Commission will hold a public hearing to review the following issue:

Conditional Use Review:
The Planning Commission has requested to review CUP2010-05, a proposal by the Stevenson Baptist Church to construct a 40' x 94' gymnasium and classroom building at a church in the R1-Single-Family Zone located at 252 NW Roosevelt Street (Tax Lot 03-07-36-24-1200). The public hearing is scheduled for 6:05pm.

The public hearing will be held Monday February 11th, 2013 at City Hall, 7121 E Loop Road, Stevenson, WA.

Your attendance, comments, and inquiries are cordially invited. The proposals are available for public review at City Hall during regular business hours.
City Hall is accessible to people with disabilities. Please call at least 24 hours in advance at (509) 427-5970 (TDD: 1-800-833-6388) if you require spe-

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SD #303 EXCESS M&O	2.020526
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SD #112-6 CAP PROJ	0.141966
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THESE LEVIES ARE PER THOUSAND DOLLARS OF VALUATION AS CERTIFIED TO ME BY THE COUNTY ASSESSOR. COPIES ARE AVAILABLE IN MY OFFICE.

CHERIE FLOOD
SKAMANIA COUNTY TREASURER

Cascade Sportsman's Club
WDFW Hunters
2013 Safety Class schedule

1st class
March 18, 20, 22, 25, 27 & 29 Range day March 30th
2nd class
May 13, 15, 17, 20, 22, & 24
Range day May 25th.
3rd class
July 15, 17, 19, 22, 24 & 26
Range day July 27th.

Students need to be in class 5:45 p.m. the first night, remaining classes run 6 p.m. to 9 p.m. To register online, go to Website: wdfw.wa.gov. Click on Hunters Education to register. Call W.D.Truitt with questions: 509-427-5906.

These classes are made possible through the combined efforts of the Cascade Sportsman's Club and the Washington State Department of Fish and Wildlife.

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