CITY OF MILTON-FREEWATER, OREGON

WATER SYSTEM MASTER PLAN

2009

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SIGNED

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EXECUTIVE SUMMARY

This Executive Summary briefly summarizes the results of the Water System Master Plan prepared for the City of Milton-Freewater by Anderson·Perry & Associates, Inc. The recommendations outlined hereafter have been developed in cooperation with the Milton-Freewater City staff. The focus of this study has been on the overall water system, including the water supply, storage, and distribution systems. The study includes an analysis of the existing system and its performance, evaluation of system needs, evaluation of improvement alternatives, and prioritization of improvements. Included in this Executive Summary is a brief discussion of the existing water system, recommendations to meet future demands on the water system, and an evaluation of the current financial status of the water department. For a more detailed discussion of the information presented in this Executive Summary, please refer to the individual chapters of this Master Plan.

EXISTING WATER SUPPLY AND WATER RIGHTS

Water Supply Facilities. The City of Milton-Freewater draws water from basalt aquifers using seven wells ranging in depth from 502 feet to 1,051 feet. Generally, the City's wells provide good quality water; however, the City has experienced an entrained air problem with some of the wells. The total capacity of all seven of the City's wells is approximately 7,520 gallons per minute (gpm). A brief summary of information for each of the City's wells, and their current status, is summarized hereafter.

> **Well No. 1.** Well No. 1 was rehabilitated in 1971 and extended 15 feet to a depth of 651 feet. The well is one of the oldest in the City and is currently not regularly operated to meet City demands due to an air entrainment problem. Well No. 1 has a capacity of 830 gpm (11 percent of the total available supply).
>
> **Well No. 2.** Well No. 2 was rehabilitated in May of 1988. The well was shut down in 1993 due to aeration problems developing in the water. This well has been continually monitored by the City since it developed air entrainment in 1990. A separate discharge line was routed from Well No. 2 to the Middle Reservoir in 2001 to facilitate removal of entrained air. Well No. 2 has a capacity of 750 gpm (10 percent of the total available supply) and is currently used to provide 15 to 23 percent of the City's water supply.
>
> **Well No. 3.** Well No. 3 was rehabilitated in January of 1991 and shut down in March of 1993 due to aerated water problems. An attempt to seal the aquifer and set the pump column to a greater depth was undertaken after the well was taken off line. However, the sealing effort failed to stop the aeration problem and a new transmission line was constructed in 1999 to allow the well to discharge to the North Reservoir. Well No. 3 has a capacity of 1,150 (15 percent of the total available supply) and is currently used to provide 20 to 22 percent of the City's water supply.

Well No. 5. Well No. 5 was deepened 10 feet in 1980. The well was rehabilitated in 2000. It is believed that the principal aquifer is located in the bottom 30 feet of the hole (below 470 feet depth). This is the oldest well in the City and saw increased production in 1998 and 1999, accounting for approximately 30 percent of the City's annual water production during that period. This well developed air entrainment problems in September 2000 and a separate discharge into the North Reservoir was constructed in 2001. Well No. 5 has a capacity of 1,100 gpm (15 percent of the total available supply) and is currently used to provide about 14 to 17 percent of the City's water supply.

Well No. 6. Well No. 6 was rehabilitated in 1992. The hole is crooked and placing the original column was difficult. Well No. 6 also developed air problems and a separate discharge into the North Reservoir was constructed in 1999. Well No. 6 has a capacity of 1,400 gpm (19 percent of the total available supply), and is currently used to provide about 21 to 25 percent of the City's water supply.

Well No. 8. Well No. 8 was originally 888 feet deep and was deepened to 1,051 feet in 1970, becoming the City's deepest well. The well was rehabilitated in 1969 and 1970. This well is the most recently drilled well in the City and currently provides very little supply because it is the least efficient well to operate. Well No. 8 has a capacity of 1,490 gpm (20 percent of the total available supply).

Well No. 9. Well No. 9 was acquired by the City in 1993 after previously being owned and operated by the Umatilla Canning Company. The last rehabilitation of the well was completed in 1997. This well serves both the Middle and South Pressure Zones through separate control systems for the primary pump and a separate set of booster pumps. The primary pump is controlled by system controls at the Middle Reservoir while the booster pumps are controlled by system controls at the South Reservoir. Well No. 9 has a capacity of 800 gpm (11 percent of the total available supply) and is currently used to provide about 20 to 23 percent of the City's water supply.

Water Rights. The City of Milton-Freewater holds groundwater and surface water rights issued by the State of Oregon for each of its supply sources. All of the City's wells are utilized at a rate less than the allowed flow volume under the associated water rights. A summary of the water rights information is listed in the following table.

WATER RIGHTS

Water Source	Application Number	Permit Number	Certification Number	Allowed Flow Volume (cfs/gpm)*	Priority Date
Well No. 1	U-109 G-5389	U-102 G-4924	12070	1.5 / 673 2.0 / 898	1/18/37 1/4/71
Well No. 2	U-159	U-150	15548	3.0 / 1,346	2/28/44
Well No. 3	U-191	U-172	16998	3.5 / 1,571	1/10/46
Well No. 5	U-809	U-718	23533	2.7 / 1,212	4/13/55
Well No. 6	U-511	U-462	23519	3.5 / 1,571	7/16/52
Well No. 8	G-2502	G-2312	41011	3.9 / 1,750	12/13/62
Well No. 9	G-13494	G-12582	20806	3.3 / 1,481	8/16/93
Walla Walla River	--	D-12920	12920	7.24 / 3,245	1890

* cfs = cubic feet per second
Gpm = gallons per minute

EXISTING WATER STORAGE

The City of Milton-Freewater currently has three water storage reservoirs, one for each pressure zone. The North Reservoir is a 2 million-gallon steel storage reservoir that was constructed in 1960. The base elevation of the reservoir is 1,145 feet above MSL, and the reservoir is approximately 40 feet tall. The reservoir serves the north pressure zone of Milton-Freewater by gravity flow.

The Middle Reservoir is a 1 million-gallon steel reservoir that was constructed in 1956. The base elevation of this reservoir is approximately 1,210 feet above MSL, and the reservoir is approximately 30 feet tall. The Middle Reservoir serves the middle pressure zone of Milton-Freewater by gravity flow.

The South Reservoir is a 2 million-gallon steel storage reservoir constructed in 1999. The base elevation of this reservoir is approximately 1,444 feet above MSL, and the reservoir is approximately 24 feet tall. The South Reservoir serves the south pressure zone of Milton-Freewater by gravity flow.

EXISTING DISTRIBUTION SYSTEM

The City of Milton-Freewater's water distribution system consists of approximately 45 miles of pipe, with 20 percent of the system having been installed in the 1940s or earlier. The water mains range from 2 inches to 20 inches in diameter with materials including asbestos concrete, cast iron, ductile iron, galvanized iron, polyvinyl chloride (PVC), reinforced concrete pressure pipe (RCPP), and steel pipe. The few areas in the City served by 2-inch lines were developed in the 1940s. Over the last few decades, replacement and installations have been made with C900 PVC pipe.

In general, the distribution system is reported to have good hydraulic performance, is well looped (providing supply to developed portions of the City from two or more directions), and has relatively large diameter water distribution mains spread throughout the service area. The City indicated that the water main lines are generally in good condition. The City has an annual water main replacement program in place in order to alleviate local problems that may arise in the system.

EXISTING PRESSURE ZONES

The City of Milton-Freewater currently operates three pressure zones in their distribution system. The North Pressure Zone serves the north area of the City of Milton-Freewater to a southerly limit of Broadway Avenue. The Middle Pressure Zone covers an area extending from Broadway Avenue to the south end of the City Limits, excluding a small area in the southwest portion of town. The third zone is relatively new and is called the South Pressure Zone. It serves the higher ground in the southeast areas of the City and further south along U.S. Highway 11 within the Urban Growth Boundary.

The North Pressure Zone has static pressures ranging from 65 psi at the south end of the zone up to 98 psi at the extreme north end of the City near Powell Road. The North Pressure Zone can be supplied by the Middle Pressure Zone through a pressure reducing valve (PRV) located at the intersection of DeHaven Street and East Broadway Avenue. This PRV is normally closed but it is set to open when the North Pressure Zone system falls 20 psi below the Middle Pressure Zone. A separate isolation valve between these two zones is located at N.E. 1st Avenue and U.S. Highway 11. This valve is closed during normal system operation but can be opened in emergency conditions.

The Middle Pressure Zone creates static pressures of 100 psi near Broadway Avenue down to 40 psi at the higher elevations along the bluffs in the southwest area of the City. The lowest pressures are seen on Jacquelyn Street, which is located at the highest point in the service area on the southwest hillside.

Static pressures in the South Pressure Zone range from 50 psi near the Sykes Corporation to 126 psi at Well No. 9. Operation of the South Pressure Zone is tied to the Middle Pressure Zone in two critical ways. First, booster pumps located at the Well No. 9 pump house are controlled by a pressure transducer at the South Reservoir, which activates the booster pumps when the reservoir level is low. Water is then drawn from the Middle Pressure Zone and pumped up to fill the South Reservoir. Second, water being fed out of the South Reservoir is then cycled back into the Middle Pressure Zone through a PRV located in the Well No. 9 pump house. This PRV is set to allow a constant 40 gallons per minute (gpm) flow from the South Pressure Zone to the Middle

Pressure Zone (to help circulation of water in the South Reservoir) and increase this flow when pressures drop in the Middle Pressure Zone.

SUMMARY OF SYSTEM NEEDS

The improvements identified during preparation of this Water System Master Plan are briefly outlined hereafter. Because of the nature of the City's needs, some of the improvements are considered to be of higher priority than others.

Water Supply Improvements. Water supply improvements are recommended in order to connect City Well No. 1 to the Middle Reservoir. This transmission line is intended to deliver water with entrained air from the well directly to the reservoir where the entrained air can dissipate under atmospheric conditions.

Water Storage Improvements. Recommended water storage improvements are related to maintenance of the City's existing reservoirs. They include cleaning, sandblasting, and painting the interior of the Middle Reservoir and the interior and exterior of the North Reservoir.

Water Distribution System Improvements. Several distribution system improvements are outlined in detail in Chapter 5 of this Water System Master Plan. The City has developed a detailed distribution system improvements project list as presented in Chapter 5. The distribution system improvements project list was developed to list all main lines that should be replaced due to being undersized, to eliminate dead end lines where possible, and to replace main lines that have deteriorated to the point they must be replaced to remain in reliable service. The City periodically replaces distribution system main lines using City crews.

PRIORITY OF IMPROVEMENTS

The water system improvements summarized in this Waster System Master Plan are important to help meet the City's year 2028 water system needs. Because some needs may be of higher priority, the City may wish to complete the improvements in a phased approach. If a phased approach is selected, prioritizing the improvements becomes important to help ensure the City's most important water system needs are addressed first. Outlined in the following table is the recommended priority for the water system improvements described in this Master Plan.

PRIORITY OF WATER SYSTEM IMPROVEMENTS

Priority	Improvement	Reason for Priority Ranking
A	Connecting Well No. 1 to the Middle Reservoir	Allows all water supply sources to be used on a daily basis and reduces the burden on other City wells.
B	Painting of Middle and North Reservoirs	Prevents further deterioration of existing reservoir coating and the potential damage to reservoir components.
C	Distribution System Improvements	Replaces aging main lines, provides looping for dead-end lines, improves water quality, and provides improved fire protection.

CURRENT FINANCIAL STATUS

Existing Debt. The City of Milton-Freewater currently has two outstanding general obligation bonds on the water system. These bonds are summarized in the following table:

OUTSTANDING GENERAL OBLIGATION BONDS

Original Amount	Year Issued	Year Debt Expires
$465,000	1994	2013
$1,815,000	1997	2018

The annual principal and interest payments remaining for both loans are approximately $183,840 per year through 2013, then approximately $145,697 per year until the year 2018.

Annual Water System Costs. The annual cost of operating, maintaining, and making improvements to Milton-Freewater's water system is summarized in the following table. The costs presented include all costs for the water system. The City's annual expenditures have been increasing over the last five years at an annual rate of approximately 5.3 percent.

In order to simplify the complex array of revenue sources and expenditures, the annual revenue from water system sources (services, water meter sales, system development charges, merchandising, and interest income) has been compared with annual total operation and maintenance (O&M) costs, debt service costs, and inter-fund transfers. The table below presents this information.

ANNUAL WATER SYSTEM REVENUE VS. EXPENDITURES

Fiscal Year	Revenue from Water System Sources[1]	O&M, Debt, and Transfer Expenditures	Balance
2003-04	$919,268	$922,727	($3,459)
2004-05	$945,447	$969,421	($23,974)
2005-06	$976,176	$957,799	$18,377
2006-07	$1,045,292	$1,071,916	$26,624
2007-08	$1,092,455	$1,073,769	$18,686
2008-09[2]	$1,228,100	$1,196,335	$31,765

1 Includes revenue from water user fees (services), water service installations (water meter sales), and system development charges.

2 2008-09 data are derived from the City's budget.

The positive balances since 2005-06 show that operation of the City's water system has been adequately funded over this period. The surplus of revenues from water system sources over O&M, debt service, and transfer expenditures has averaged approximately $23,863 annually over the last four years. The above data shows that O&M, debt, and inter-fund transfer expenditures will likely exceed $1,200,000 in fiscal year 2009-10.

CONCLUSIONS

The specific chapters of this Water System Master Plan contain a detailed analysis of the water supply, storage, and distribution system components of the City's water system. Based on the results of this Water System Master Plan, the City of Milton-Freewater has an excellent water system that is currently meeting existing system demands. The water department has sufficient revenue to operate and maintain the water system. The City's water supply sources and storage reservoirs appear to have adequate capacity to meet current and future needs for the 20-year planning period of this Plan, assuming growth occurs as outlined in Chapter 2. The water system is also in compliance with the Drinking Water Program.

To help ensure the water system continues to provide reliable operation and is able to meet future anticipated needs, the City should consider completing some system improvements as outlined in this Water System Master Plan. These improvements include a separate discharge line to the middle reservoir for Well No. 1 (to remove entrained air), painting the middle and north reservoirs, and distribution system improvements as outlined in Chapter 5.

CHAPTER 1

BACKGROUND INFORMATION

PURPOSE OF STUDY

This study presents the results of a Water System Master Plan authorized by agreement between the City of Milton-Freewater, Oregon, and Anderson·Perry & Associates, Inc., dated September 2, 1999. The purpose of the Master Plan is to develop water system design criteria for the planning period; evaluate the adequacy of the existing water supply, storage, and distribution systems; evaluate alternatives for improving the City's water system; and develop a financial plan for implementing the recommended improvements, should the City desire to complete major improvements. This Water System Master Plan is intended to satisfy the criteria of the Oregon Department of Human Services - Drinking Water Program (DWP) (formerly the Oregon Health Division) and Oregon Administrative Rule (OAR) 333-061-0060. Specifically, the Plan includes the following:

1. **General:** The Plan provides a general description of the community and history of the existing water system. A summary of the planning objectives and goals is outlined.

2. **Existing System:** The Plan outlines the status of the existing water system and describes its current operation, system strengths, and system deficiencies.

3. **Design Criteria:** Planning and design criteria are established and include establishment of a service area; population growth projections; past, present and future water usage patterns; fire flow requirements; federal and state standards; system pressures; and service goals. A growth rate for the City of Milton-Freewater is projected and a year 2028 design population has been selected by the City.

4. **Water Supply Facilities:** The individual components of the existing water supply system are analyzed considering capacity, compliance with current water quality standards, water rights, condition of components, operational dependability, and cost of operation. The water supply needs for the planning period have been developed and cost-effective alternatives for meeting long-term water supply needs are identified, including alternatives for correcting existing system deficiencies. Estimated costs for the preferred alternatives are presented, and general operation and maintenance requirements for the water supply system are outlined.

5. **Water Storage Facilities:** The existing water storage facilities are analyzed considering capacity, condition of reservoirs, distribution system pressures, etc. Recommended storage capacity is analyzed considering emergency storage, operational storage, equalization storage, and fire

reserve storage. Alternatives for meeting the storage requirements of the water system for the planning period are identified.

6. **Distribution System/System Mapping:** Utilizing existing distribution system maps and City records, a general review of the condition and adequacy of the distribution system piping is made. General system deficiencies are identified and alternatives for meeting current, as well as future, system deficiencies are outlined with estimated costs for implementation. General operation and maintenance requirements of the distribution system are also outlined. The City's electronically produced map of the distribution system is contained in a pocket at the end of this Plan.

7. **Water System Financing:** The status of the existing Water Department's financial condition is reviewed considering historical water system revenues, operational and maintenance costs, and debt service including the adequacy of existing water user fees. The future cost of operation and maintenance, capital improvement investments, and debt service for the water system is projected. Information is provided on potential state and federal grant and loan programs that may be available to assist the City in implementing water system improvements. A strategy for implementation of the recommended water system improvements is developed.

8. **Planning and Implementation Recommendations:** A summary is prepared identifying current and future water system needs with their associated estimated cost. Recommendations are made for meeting the water system needs for the planning period, and an Implementation Plan outlines project schedules, financing alternatives, and improvements to be made, should the City elect to complete water system improvements.

DESCRIPTION OF COMMUNITY

The City of Milton-Freewater is located along Oregon State Highway 11, adjacent to the Walla Walla River in Umatilla County. It is about 10 miles south of the City of Walla Walla, Washington. Figures 1-1 and 1-2 show a location map and general layout of the City of Milton-Freewater. The population, as reported by the Population Research Center at Portland State University, was 6,550 as of July 1, 2007. The primary economic base for the community is agriculture with some related food processing industry. The City of Milton-Freewater has also evolved into a "bedroom" community of the larger City of Walla Walla.

The City of Milton-Freewater was originally settled as two separate towns in the 1800s. Milton incorporated in 1889 and Freewater in 1892. Milton was named by pioneer W.J. Frazier for the poet, Milton. Freewater was named for the offering of free water by the City's forefathers. In 1950 the towns were merged and today bear the name Milton-Freewater, Oregon. The combined cities enjoy a long growing season similar to that of the Willamette Valley that results in the exportation of a variety of foods. Milton-Freewater hosts major fruit and vegetable packing, canning, and freezing industries. The City also continues to maintain its own electric power company, which provides local residences and businesses with some of the lowest power rates in the Northwest.

ENVIRONMENT

General. Umatilla County is bounded on the north by the Columbia River and the State of Washington, on the east by Union and Wallowa Counties, on the south by Grant County, and on the west by Morrow County. Umatilla County is divided into three watersheds that eventually drain into the Columbia River. The Umatilla River basin drains approximately 75 percent of the County, while the southern portion of the County is drained by the North Fork John Day River and the northern portion is drained by the Walla Walla River.

Topography and Drainage. The general slope of the County is to the north and west, with major drainage flowing to the west and northwest. Elevations gradually rise, as one travels south and east from the Columbia River, to approximately 5,200 feet at the southeast end of the County.

The elevation within the City of Milton-Freewater's Urban Growth Boundary (UGB) ranges from about 930 to 1,480 feet above mean sea level (MSL) and encompasses approximately 2,695 acres. The City has an average elevation of approximately 1,050 feet. In general, the area in the vicinity of the City slopes downward to the northwest. The principle stream draining the area within and near Milton-Freewater is the Walla Walla River located on the eastern edge of the City. The Little Walla Walla River runs through the City and provides drainage on a smaller scale.

Climate. In general the climate in the Milton-Freewater area is mild. The area experiences a four-season climate with cold winters, hot summers, and mild weather during spring and fall. Ordinarily, about 70 percent of the precipitation in the region occurs in the six-month period from October to March. The average annual precipitation for Milton-Freewater is about 14.33 inches. Approximately 12 percent of the precipitation falls in the form of snow and seldom does more than a few inches of snow accumulate at any one time. The average annual snowfall for Milton-Freewater is about 20 inches.

According to National Weather Service records, the average annual temperature is 53.5°F. The highest temperature recorded each year is rarely higher than 100°F and the lowest temperature seldom reaches 0°F.

Soils. The Soil Survey of Umatilla County Area, Oregon (U.S. Department of Agriculture, Soil Conservation Service, 1984) identifies seven general soil categories in the Milton-Freewater area: Walla Walla Silt Loam, Freewater-Urban Land Complex, Freewater Very Cobbly Loam, Nansene Silt Loam, Lickskillet Very Stoney Loam, Oliphant Silt Loam, and Riverwash.

The predominant soil within the City of Milton-Freewater is almost entirely the Freewater-Urban Land Complex. This soil is deep and somewhat excessively drained.

Runoff is slow, and the hazard of water erosion is slight. The permeability of this soil is moderate to a depth of 20 inches and very rapid below this depth.

Air Quality. Air quality within the study area is generally good. The prevailing wind is from the south with good air movement through the Walla Walla Valley. Monthly average wind velocity is 6.4 miles per hour. During the fall, air quality is often reduced by dust from agricultural activities, rangeland and forest fires, and burning of ditches and fields.

Transportation. Transportation to the City of Milton-Freewater is provided by state highways, rail lines, and nearby airports. Milton-Freewater is located on Oregon State Highway 11, ten miles south of Walla Walla, Washington, and about 28 miles northeast of Pendleton, Oregon. U.S. Highway 12 runs through Walla Walla, Washington, and serves as a major east/west corridor across Washington. Rail service in the area is provided by the Union Pacific Railroad through a branch line with sidings located in the City. Air service via regularly scheduled common carrier for passengers and freight is available in Walla Walla and Pendleton. Bus service is available in the City.

WATER SYSTEM HISTORY

Distribution System. Historical information for the City of Milton-Freewater's water distribution system is readily available and includes an electronically produced map of the distribution system. A majority of the historical water system information was obtained from City records and conversations with Howard Moss, former Public Works Superintendent. The system consists of approximately 45 miles of pipe, with 20 percent of the system having been installed in the 1940s or earlier. Water mains range from 2 inches to 20 inches in diameter with materials including asbestos concrete, cast iron, ductile iron, galvanized iron, polyvinyl chloride (PVC), Reinforced Concrete Pressure Pipe (RCPP), and steel pipe. The few areas in the City still served by 2-inch lines were developed in the 1940s. Over the last decade or so, replacement and installations have been completed using C900 PVC pipe.

Prior to the merger of Milton-Freewater, both the Cities of Milton and Freewater operated their own water systems. Shortly after consolidation, the decision was made to operate the systems at separate pressure levels. This decision was made on the belief that the Freewater system would not withstand the higher operating pressures provided by Milton. The pressure difference results from an approximate 65-foot base elevation difference between the north (Freewater) and middle (Milton) reservoirs.

The City of Milton-Freewater currently operates three pressure zones in their distribution system. The north zone serves the north area of the City of Milton-Freewater down to Broadway Avenue. The middle pressure zone covers an area from Broadway Avenue to the south end of the City. The third pressure zone is relatively new and is called the south zone. It serves an area from the southern extent of the City limits to the southern portion of the UGB. The pressure zone layout is shown in Figure 4-1 at the end of Chapter 4. The pressure zones and distribution system are discussed in greater detail in Chapters 4 and 5. The layout of the existing distribution system is shown on the Water System Map, contained in a pocket at the end of this report.

Water Supply. Prior to 1959, the City obtained its drinking water from a combination of wells and surface water from the Walla Walla River. Currently, the City obtains its water supply from seven groundwater wells (Wells No. 1, 2, 3, 5, 6, 8, and 9). Well No. 1, located at S.E. 9th and Mill, was constructed in 1937 and improved in 1971. It was drilled to a depth of 651 feet and supplies the middle distribution system. Well No. 2, constructed in 1944, is located on S.W. 8th and Columbia and extends to a depth of 902 feet. It also supplies the middle distribution system. In 1946, Well No. 3 was constructed and drilled to a depth of 575 feet. It was refurbished in 1969 and supplies the north distribution system from the intersection of N.E. 1st and Russell Streets. Well No. 3 can also serve the middle distribution system by the opening and closing of specific valves. Well No. 5, constructed in 1936 to a depth of 502 feet, is located on N.E. 5th near Peabody Street and supplies the north system. Well No. 6 is located on N.W. 4th near Lamb Street and was constructed in 1950 to a depth of 952 feet. It also supplies the north distribution system. On Couse Creek Road, near the Walla Walla River, Well No. 8 was constructed in 1965 and improved in 1970. It was drilled to a depth of 1,051 feet and supplies the middle water distribution system. Well No. 9 was drilled in 1951 and improved in 1972. The City of Milton-Freewater acquired this well in 1993 and completed improvements in 1999 to fill a new south-end reservoir. However, Well No. 9 can also pump into the middle distribution system as needed. Well No. 9 is located near S.E. 16th Avenue west of Basket Mountain Road and was drilled to a depth of 913 feet. Locations of the wells are shown in Figure 1-2.

Water Storage Reservoirs. The City of Milton-Freewater currently has three water storage reservoirs, one for each pressure zone. The north reservoir is a 2-million-gallon steel storage reservoir that was constructed in 1960. The base elevation of the reservoir is 1,145 feet above MSL, and the reservoir is approximately 40 feet tall. The full water surface elevation in this reservoir is approximately 1,183 feet above MSL. The reservoir serves the north pressure zone of Milton-Freewater by gravity flow.

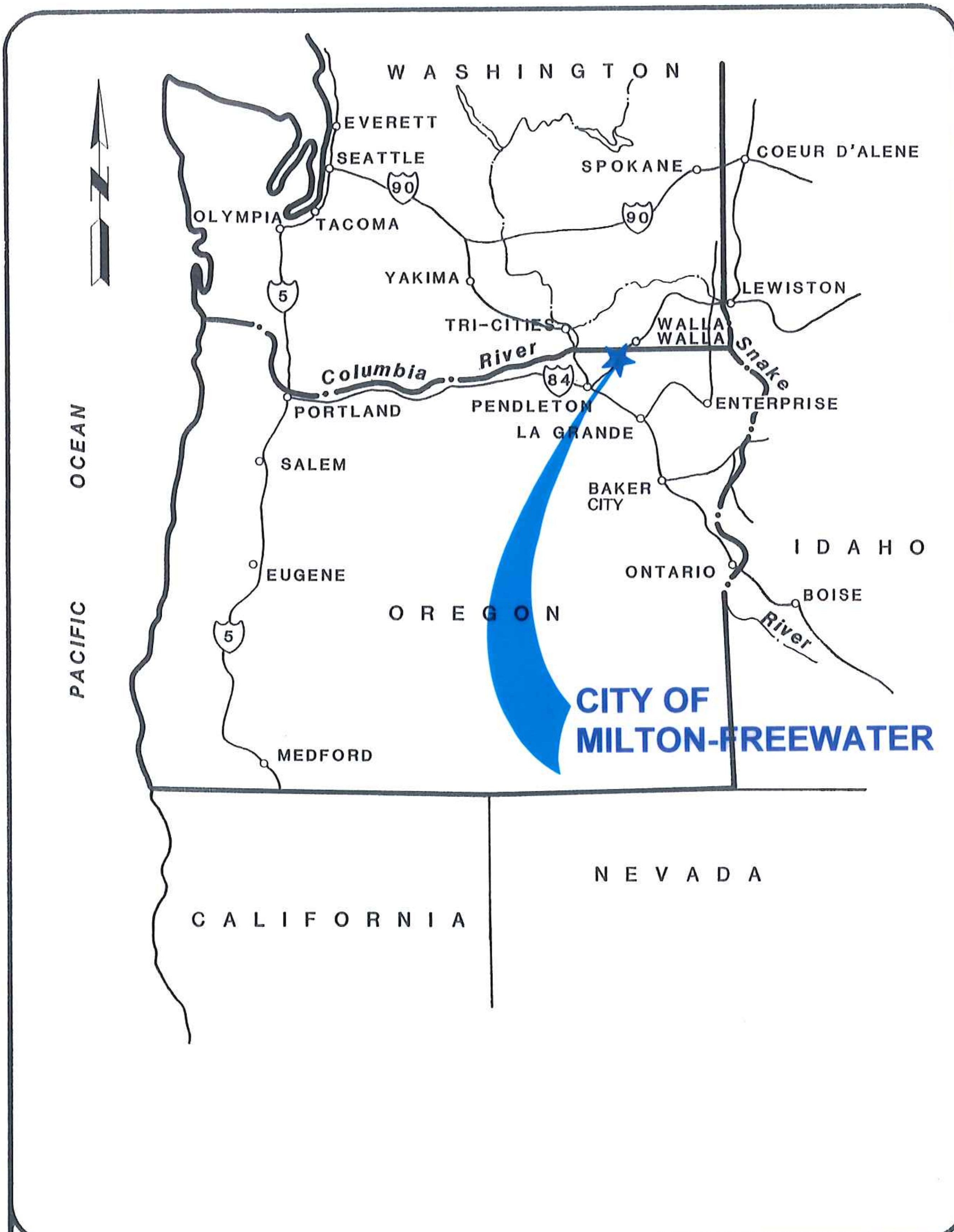
The middle reservoir is a 1-million-gallon steel reservoir that was constructed in 1956. The base elevation of this reservoir is approximately 1,210 feet above MSL, and the reservoir is approximately 30 feet tall. The full water surface elevation in this reservoir is approximately 1,238 feet above MSL. The middle reservoir serves the middle pressure zone of Milton-Freewater by gravity flow.

The south reservoir is a 2-million-gallon steel storage reservoir constructed in 1999. The base elevation of this reservoir is approximately 1,444 feet above MSL, and the reservoir is approximately 24 feet tall. The full water surface elevation in this reservoir is approximately 1,466 feet above MSL and serves the south pressure zone of the City of Milton-Freewater by gravity flow. The locations of the City's reservoirs are shown in Figure 1-2.

Booster Pump Station. The City currently has two booster pumps in their distribution system. Both booster pumps are located in the Well No. 9 well house and are used to transfer water from the middle distribution system to the south distribution system, filling the south reservoir. These pumps are controlled by the water level in the south reservoir. The location of the booster pump station and the Well No. 9 well house is shown on the Water System Map contained in a pocket at the end of this report.

PREVIOUS STUDIES

Two previous studies related to expansion of the City's infrastructure systems, including water, have been developed. The Southside Infrastructure Planning Study (Anderson·Perry & Associates, Inc., 1996) addressed infrastructure needs related to a proposed 50-acre industrial park on the south side of the City. Development of the booster pump station at Well No. 9 and south reservoir was completed to serve this industrial park. A second study, the North Milton-Freewater Utility Study (Anderson·Perry & Associates, Inc., 1999) was developed for Umatilla County in cooperation with the City of Milton-Freewater. This study included options and estimated costs to provide water service to customers north of Milton-Freewater. If the City of Milton-Freewater considers delivering water to this area in the future, the analysis, recommendations, and cost estimates provided in this previous study should be reviewed, modified, and updated as required. Because this previous study was completed for the area north of Milton-Freewater, analysis of water delivery to the areas north of the current City Limits is not addressed in this Water System Master Plan.



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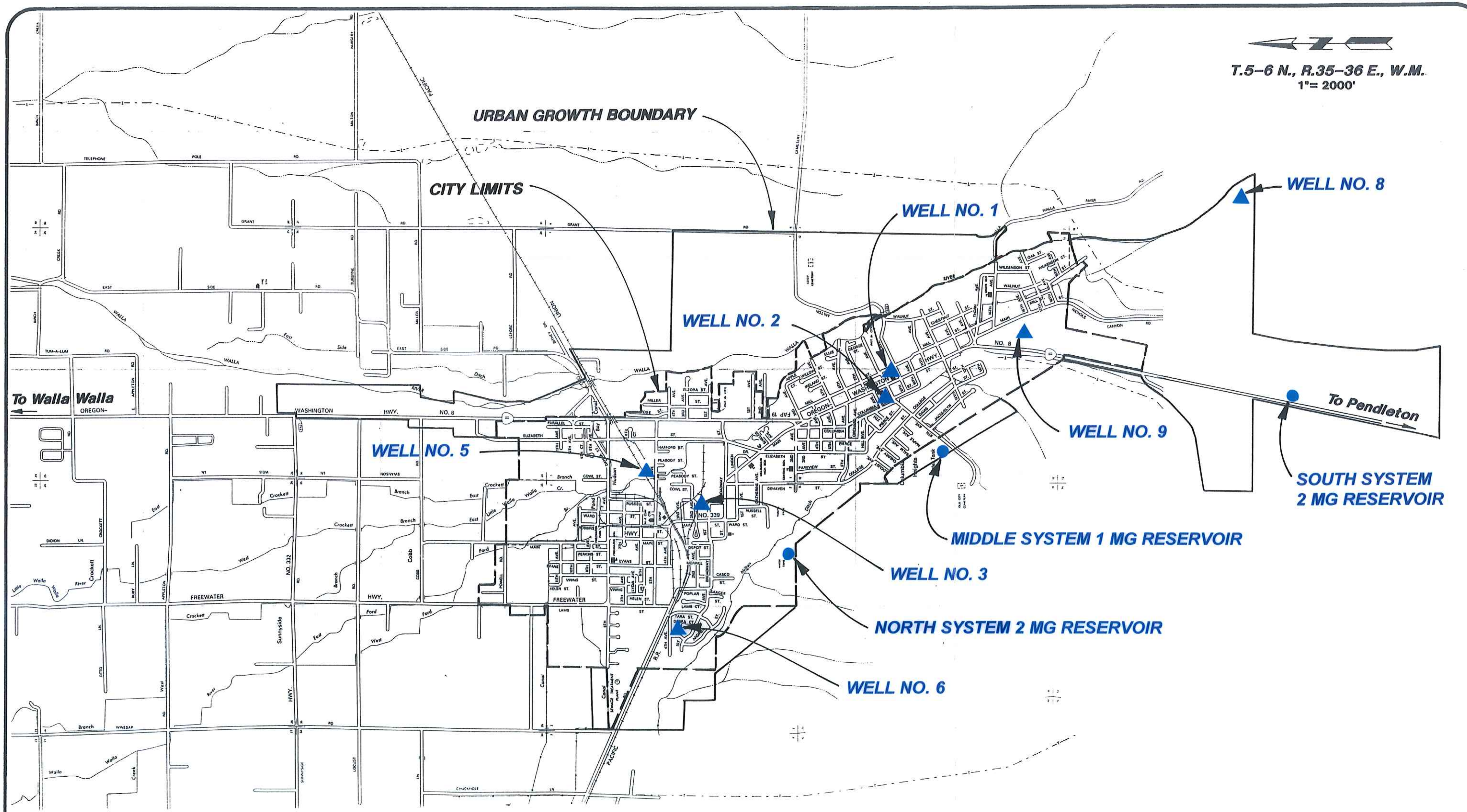
CITY OF
MILTON-FREEWATER, OREGON
WATER SYSTEM MASTER PLAN

LOCATION MAP

FIGURE 1-1



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CITY OF
MILTON-FREEWATER, OREGON
WATER SYSTEM MASTER PLAN
RESERVOIR AND WELL LOCATIONS

FIGURE 1–2

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CHAPTER 2

WATER SYSTEM REQUIREMENTS

INTRODUCTION

This chapter presents basic information from which criteria has been developed for evaluating the City's existing water system and for defining and sizing the required components of the system. Information concerning the service area, population projections, water use, and state and federal requirements is presented.

SERVICE AREA

The term "service area" refers to the area being served with water from the City's water system. This study focuses primarily on the existing water service area. The present service area consists of the developed lands within the boundaries of the City Limits and some areas outside the City Limits within the Urban Growth Boundary (UGB) (i.e., south pressure zone). For the purpose of this study, the future service area consists of the present service area and the areas inside the UGB currently served by the water system.

The present UGB of Milton-Freewater encompasses a considerable area that is not likely to be fully developed within the planning period of this study. This includes areas adjacent to State Highway 11 both north and south of town and the upper hills on the east side of the City. If development occurs in these areas, significant water system improvements may be needed similar to improvements completed in 1999 for the south industrial park. Because of the unknown timeframe of such a development, it would be wise to complete a study specific to the development similar to the Southside Infrastructure Planning Study completed in 1999. Such a study could focus in a more detailed manner on the improvements needed to serve the particular area to be developed.

SERVICE POPULATION AND PLANNING PERIOD

In order to estimate the demands that may be placed upon a municipal water system, a determination of the population to be served must be made. Population estimates must be made with reference to time. Projections are usually made on the basis of an annual percentage increase estimated from past growth rates, tempered by future expectations. It is very difficult to accurately predict the population of a community over any extended period of time. The addition or deletion of a major business, industry, or recreation use in the area could significantly affect the population and the overall water system needs.

The period of time over which the population is to be projected usually depends on the type of improvements to be considered. Improvements that will require long-term financing should be designed for no less than the term of the financing. Facilities that are readily expanded or modified are normally designed for a period of 10 to 20 years. Facilities that are not easily modified or expanded, such as buried pipelines and storage reservoirs, may be designed for their expected life, which is usually 40 to 50 years, or more.

The 2007 population of the City of Milton-Freewater is estimated to be 6,550. Past population trends for the City of Milton-Freewater, comparing data from 1960 through the present, have shown steady growth with a decline in the late 1980s. The 1990s showed steady and continual growth, although the 2000 Census numbers decreased the population count slightly. These historical population trends are shown in Figure 2-1.

The historical population data shown on Figure 2-1 was provided by the Population Research Center at Portland State University. This agency is the official source of population data in Oregon between the official census data generated at the beginning of each decade. The University does not project population increases for individual cities within the state. Therefore, no official projection is available for Milton-Freewater. However, a population projection for Umatilla County through the year 2040 has been prepared by the Oregon Department of Administrative Services, Office of Economic Analysis. They have projected an average annual growth rate for Umatilla County of 0.7 percent.

The population projections for Milton-Freewater shown on Figure 2-1 are at 1.0, 1.5, and 2.0 percent. These growth rates are above the County projections but are likely representative because most of the growth in the County is anticipated to occur in the larger cities. The Wastewater System Study performed in 1998 used a 2.0 percent growth rate. The City of Milton-Freewater has indicated the same growth rate of 2.0 percent should be used for the period of this study. This results in a population in the year 2028 of 9,928 (rounded down to 9,750). It should be recognized, however, that over the planning period of this study, actual growth could exceed or fall well below the figures presented in Figure 2-1.

LAND USE

The City of Milton-Freewater began work on a Comprehensive Plan in 1975, and it was adopted in March of 1980. The first periodic review began on December 2, 1985, and was completed in May of 1987. Amendments to the Comprehensive Plan began in 1987, with the most recent being in August of 1998.

The table below provides descriptions of the zoning classifications established with the latest update to the Comprehensive Plan and that are shown on the Zoning Map contained in a pocket at the end of this Plan.

ZONING CLASSIFICATIONS

Zoning Code	Description
R-1	Low Density Residential (< 4 units per acre)
R-2	Medium Density (up to 16 units per acre)
R-3	High Density Residential (up to 26 units per acre)
MSR	Main Street Residential
DB	Downtown Business
C-1	Retail and Service Commercial
C-2	General Commercial
I-M	Industrial Manufacturing
PL	Public Lands
CO	Civic Overlay
BP	Business Park
RM	Residential Mixed Use
EFU	Exclusive Farm Use
F-1	Farm Use
RSC	Retain Service Commercial

Commercial areas are primarily located along Highway 11, running north and south through the City, and along the Main Street/Broadway areas of old Freewater. Residential areas are to the outside of the north/south corridor of Highway 11 and surround the City Center area of old Freewater. Industrial areas are located to the south end of the City of Milton-Freewater, with the majority located along the railroad tracks through the old Freewater section of town.

Undeveloped areas are present within the City of Milton-Freewater, primarily to the south and north. Undeveloped area within the City Limits west of town will likely remain undeveloped due to the steep slope of the terrain. Large, undeveloped areas to the south and northeast are also present within the current UGB. The City anticipates that there is adequate land available within the UGB for all projected growth to and possibly beyond the year 2028.

As stated earlier, some of these undeveloped areas, especially the steeper hillsides on the east side and extreme south side of the City, would likely require significant water system improvements and other infrastructure improvements if these areas are to be adequately served. Potential demands on infrastructure are a very important factor to consider when analyzing infrastructure capacity to meet current and future needs. If these areas are to be developed, information in this Water System Master Plan should be reviewed and updated, as required, to consider the demands placed on the water system. It would also be prudent to complete a more detailed infrastructure study specific to the area to be developed to better assess infrastructure needs.

REGULATORY REQUIREMENTS

The City of Milton-Freewater's water system comes under the jurisdiction of two water quality regulating agencies. The first is the U.S. Environmental Protection Agency (EPA) and the second is the Oregon Department of Human Services - Drinking Water Program (DWP). The State of Oregon assumed primacy (responsibility) in February 1986 for enforcement of the federal Safe Drinking Water Act (SDWA). Therefore, the City of Milton-Freewater is currently and will be dealing principally with the DWP as the regulating agency for their water system.

Regulatory History. The federal "Interim Primary Drinking Water Regulations" went into effect in 1977 as a result of the Safe Drinking Water Act of 1974 (Public Law No. 93-523). The primary regulations address requirements concerning elements, trace minerals, compounds, and micro-organisms that may affect the health of water consumers. The Act provides for monitoring, testing requirements, reporting, recordkeeping, and public notification procedures in the event of non-compliance. These regulations have necessitated the revision and upgrading of many water systems to meet the requirements of the Act.

1986 Amendments to the Safe Drinking Water Act. The United States Congress first enacted the Safe Drinking Water Act in 1974. In 1986, amendments became effective that required the EPA to develop additional rules for drinking water with which water purveyors must comply. As the new rules were developed, the Drinking Water Program has been adopting them. The following describe the impacts of the EPA Administrative Rules:

1. Considerably increased the number of samples and tests the City will have to perform for regulated and unregulated contaminants.

2. Required continuous disinfection of surface water supplies and groundwater supplies when used in conjunction with surface water.

3. Required filtration of most surface water sources.

4. Initiated expanded monitoring for all systems.

5. Changed current public notification requirements.

6. Ensured more aggressive enforcement on the part of the EPA.

Prior to the 1986 amendments, maximum contaminant levels (MCLs) had been set by the EPA for 22 regulated contaminants. The 1986 amendments contain a list of 83 contaminants to be regulated. These include volatile organic compounds (VOCs), synthetic organic chemicals (SOCs), trihalomethanes (THMs), 6 contaminants related to microbiology and turbidity forms, 18 inorganic contaminants, 40 organic contaminants, and 5 radionuclides. A majority of these contaminants were regulated by the EPA as of June 1989 and the state adopted the regulations in 1991.

In the 1986 amendments, congress directed the EPA to add 25 contaminants to the list every three years. The 1996 reform bill (discussed later in this section) changed this requirement, allowing the EPA to consider adding only five contaminants to the list every five years. Therefore, the list of contaminants the City will have to test for may not expand as rapidly as before, but will likely continue to expand in the future. Additionally, amendments for disinfection requirements will be adopted in the future. With the growing list of regulated contaminants, communities will be faced with the responsibility of more sampling and testing in order to remain in compliance.

The EPA has developed regulations that will provide for different types and frequency of public notification of violations based on the frequency and severity of the violation. The revised public notification requirements included in the 1986 amendments, which took effect in April 1989, require water systems to notify the persons they serve when the following instances occur:

1. When a violation of a National Primary Drinking Water Regulation or its monitoring requirements occurs.

2. When variances or exemptions are in effect.

3. When the water system does not comply with any schedule associated with a variance or exemption.

The DWP has responsibility for administering the public notification system for public water systems in Oregon. They work closely with public water systems to make sure public notification is made in accordance with regulatory guidelines, when required.

The 1986 amendments also forbid the use of pipe, solder, or flux that is not "lead-free" in public water systems or any plumbing connected to a public water system after June 1988. Lead-free is defined as 8 percent or less lead for pipes and fittings and 0.2 percent or less lead for solder and fluxes. This requirement is not intended to affect any pipe, fittings, etc., already in place. However, those systems with lead materials in their distribution systems must provide notice to "persons that may be affected by lead contamination of their drinking water." This notice must be provided even if lead concentrations in the water do not violate allowable concentrations. This provision does not apply to leaded joints necessary for the repair of cast iron pipes.

Safe Drinking Water Act Reform Bill. On August 6, 1996, the Safe Drinking Water Act reform bill was signed. The SDWA amendments of 1996 gave the EPA new ranking orders for developing rules to ensure the safety of public water supplies. The law emphasizes controlling the greatest risks at the best price, preventing contamination of source water, informing consumers annually of contaminant levels and health effects, and providing states with new flexibility to implement regulations and small systems compliance relief and assistance. Some of the key items of the reform bill that have already been passed into law are summarized below.

1. **Operator Certification**, which requires every water supplier to employ an operator to supervise the water system. The operator is required to be

certified at a grade equal to the classification of the water system. Milton-Freewater has several certified operators with the primary operator being Dave Bradshaw, Public Works Superintendent.

2. **Consumer Confidence Report (CCR)**, which requires community water systems serving 15 or more year-round customers to prepare an annual CCR to provide customers with information about the quality of their drinking water. Annual CCR reports were first due in October 1999 and the City has distributed reports annually, as required.

3. **The Arsenic Rule**, which became effective in March 2001, lowers the MCL for arsenic allowed in a community water system from 50 parts per billion (ppb) to 10 ppb. Testing in 2003 and 2005 resulted in no detection of arsenic.

4. **The Disinfectants/Disinfection By-product Rule (D/DBPR)**, which reduces levels of disinfectants and DBPs in drinking water supplies to provide public health protection from exposure to trihalomethanes, haloacetic acids, chlorite, and bromate. This rule applies to community water systems that treat their water with a chemical disinfectant, such as chlorine, for either primary or residual treatment. Required sampling was completed in 2007 and submitted to the DWP.

5. **The Groundwater Rule**, which specifies the appropriate use of disinfection while addressing other components of groundwater systems to ensure public health protection. This rule became a law in October 2006. The law requires groundwater systems to be evaluated on a case-by-case basis to determine if the system is susceptible to fecal contamination and whether or not disinfection is necessary. Source water monitoring may be required if coliform test results indicate a presence of coliforms.

6. **Radionuclides Rule**. Regulations for radionuclides in drinking water were first discussed in 1976 as interim regulations under the authority of the 1974 SDWA. The 1986 and 1996 SWDA amendments revised the rule, and the revised Radionuclides Rule was published on December 7, 2000. The Radionuclides Rule sets standards for beta and photon emitters, radium (radium-226 and radium-228), gross alpha radiation, and uranium.

   The DWP accepted radionuclide data collected prior to December 8, 2003, to substitute for the Initial Compliance Monitoring required by the rule. Water systems had to monitor once at each supply point to the water system for gross alpha, combined radium-226/228, and uranium by December 8, 2003, in order to avoid the four consecutive quarterly samples. The City of Milton-Freewater most recently sampled for radionuclides in May 1996. Radionuclides were detected in four of nine samples at concentrations well below the MCL.

Another key item of the 1996 reform bill that is not yet law, but is anticipated to be law in the near future, is the following:

> **The Radon in Drinking Water Rule**, which attempts to reduce airborne and waterborne radon concentrations to limit exposure levels. This rule will apply to community water systems serving 25 or more people that use groundwater or mixed ground and surface water.

Public Health Security and Bioterrorism Preparedness and Response Act of 2002. The Safe Water Drinking Act requires that communities with water systems serving greater than 3,300 people conduct assessments of the vulnerability of their systems to terrorist attacks or other intentional acts to disrupt water delivery to the community. In addition to the vulnerability assessments, the Act addresses Emergency Response Plans. Oregon Administrative Rule (OAR) 333-061-0064 has been developed by the DWP to implement the measures prescribed in the federal act. This rule required all public water systems to develop Emergency Response Plans by June 30, 2005. The City of Milton-Freewater has completed an Emergency Response Plan and notified the DWP of its completion in June 2004. The Emergency Response Plan should be reviewed and updated at least every five years.

Regulatory Violations. The City of Milton-Freewater has good water quality with a well run water system operation meeting federal and state water quality criteria. The DWP has issued nine violations against the City in the past seven years related to two coliform events (not enough reported) and late chemical/non-reporting (seven events). Corrective action was taken in each case and the City is in compliance. These violations are documented in the DWP's Water Quality Summaries presented in Appendix A.

Regulatory Requirements Summary. In summary, many regulations affect operation of the City of Milton-Freewater's water system. The information presented herein is intended to provide the City with a brief summary of the regulations and possible future regulations that will likely affect operation of the City's water system. In general, it appears the City is keeping up to date with water testing and reporting requirements. Water system regulations continue to expand and will require careful attention to maintain future compliance. It is recommended that the City of Milton-Freewater consult with the DWP in Pendleton, Oregon, if any regulatory questions or issues arise.

SANITARY SURVEY

The DWP conducts sanitary surveys of communities to assist in identifying potential contamination sources that may impact water quality. These surveys are generally scheduled to occur every five years.

The City of Milton-Freewater's latest Sanitary Survey was conducted on January 16, 2009. The primary findings of the survey are summarized below:

- All deficiencies noted in the April 20, 2004, Sanitary Survey have been corrected.

- The City needs to submit to DWP a completed Water System Master Plan. This deficiency was addressed in March 2009.

A copy of the full Sanitary Surveys for 2004 and 2009 are included in Appendix B.

The DWP has also published a checklist of Sanitary Survey significant deficiencies (included in Appendix B) for City staff to periodically review and address any deficiencies found. This allows the City to take a proactive approach to these surveys.

WATER DEMAND

For the purpose of identifying needed future water system improvements, future water demands can be estimated from past water use characteristics and future population projections. Water use characteristics are usually expressed in terms of various rates of water used for various periods of time. This allows components of the water system to be sized for the maximum demands that will be placed on them. The rates of water use that are important in evaluating a water supply system are:

- **Average Daily Demand (ADD)** – The ADD is the total amount of water used in a year divided by 365 days. ADD is presented as gallons per person per day, or gallons per capita day. This is the average amount of water used by each person each day of the year.

- **Peak Daily Demand (PDD)** – The PDD is the maximum total amount of water used during any 24-hour period. PDD is presented as gallons per person per day, or gallons per capita day. This is the peak daily amount of water used by each person on the highest water use day of the year. The highest water use day of the year normally occurs during the warmer summer months when irrigation uses are at their highest.

- **Peak Hour or Peak Instantaneous Demand (PHD)** – The PHD is a measure of the maximum flow of water at any given time, often over a 1-hour period. The peak hour demand normally occurs during the warmer summer months of the year.

Water supply facilities are normally designed for peak daily demands. A well or wells would normally be sized for supplying the needed water during the peak day, without continuous 24-hour operation. For example, if the water usage during high use summer months was high enough to require wells to pump 18 hours or more per day to keep up with the peak daily demand, the situation may warrant the addition of another well or other water supply source in order to provide some backup capability. Booster pumps and distribution pipelines are typically sized to deliver peak instantaneous demands. Because peak instantaneous demands often exceed the available supply, storage reservoirs are sized to include a storage amount to make up the difference between water supply capacity and peak water use rates.

To be utilized for projecting future water demands, past water use characteristics must be converted to a per capita (per person) rate of use. This is done by dividing the average day, maximum day, and peak instantaneous water use rates by the number of people being served by the water system. These water demand rates would then be expressed as gallons per capita day (gpcd). This value multiplied by a population projected for some future year gives the estimated total demand rates for that year.

In order to determine current water demand, City well pumping records from October 2000 through September 2007 were reviewed. Monthly well production for each City well for the period October 2000 through September 2007 is shown in Figures 2-2 to 2-8. These records show typical patterns of high summer demand and low fall, winter, and spring demand. Figure 2-9 shows monthly well production for all wells from October 2000 through September 2007. Figure 2-10 summarizes water production for all wells for each water year (October through September). Figure 2-10 shows the City is more recently relying primarily on Wells No. 2, 3, 5, 6, and 9 to meet demands while Wells No. 1 and 8 are rarely used.

Based on the data presented in these figures and shown below, determination of the City's average water use is as follows:

AVERAGE WATER USE

Year (October to September)	Total Water Pumped (gallons)	City Population*	Calculated Average Water Use (gpcd)
2000-01	834,043,000	6,560	348
2001-02	885,720,000	6,450	376
2002-03	916,211,000	6,500	386
2003-04	907,584,000	6,500	381
2004-05	825,250,000	6,540	346
2005-06	679,488,000	6,585	283
2006-07	704,993,000	6,550	295

* Data provided by Population Research Center at Portland State University.

Based on the data for water years 2000-01 through 2006-07, the City's average "gallons per capita day" water use has varied from a low of 283 gpcd to a high of 386 gpcd. The average of the six values shown in the table is 345 gpcd. The City indicated the recent last two years of water use data are the most representative of future expected use amounts. Therefore, an average daily flow of 300 gpcd was selected for design purposes. The City of Milton-Freewater's 300 gpcd average water demand is in the upper range of demands when compared to other cities in Eastern Oregon and Washington, as shown in Table 2-1.

To estimate the peak daily demand for the City's water system, a peak factor of 2.5 was utilized. The peak factor is a ratio of the average daily demand to the peak daily demand. Analysis of water use characteristics of several other Eastern Oregon and Washington cities during preparation of their master plans has shown that the average peak factor is 2.5. Utilizing this peak factor, the City of Milton-Freewater's peak daily demand would be 2.5 times 300 gpcd, or 750 gpcd. A peak daily demand of 750 gpcd, assuming a population of 6,550, equates to a peak daily demand flow rate of 3,411 gallons per minute. A peak daily demand of 750 gpcd will be used for planning purposes in this Master Plan.

FIRE DEMAND

Fire flow tests were performed on some of the City's fire hydrants on April 8, 1987, by ISO Commercial Risk Services, Inc. (ISO). The results of the hydrant tests are summarized in Table 2-2, and presented in Appendix C. The observed and calculated fire flow discharges available from the hydrants tested are shown. The observed test results indicate that the City of Milton-Freewater's water system can deliver fire flows ranging from approximately 580 to 2,090 gpm, with residual pressures remaining well above the minimum required 20 pounds per square inch (psi).

The fire flow test results also utilize a theoretical formula to estimate available fire flows, which are much higher, as shown on Table 2-2. It should be noted that these theoretical fire flow rate projections by ISO were determined assuming a 20 psi residual pressure. The formula assumes the 20 psi residual pressure will occur in the immediate vicinity of the fire hydrant. In reality, there may be other connections in the distribution system, such as higher elevation users in the City, that would fall below 20 psi sooner than the formula predicts due to their elevation. Therefore, the actual available fire flows are most likely less than those shown as "available" on Table 2-2. It should also be noted that individual fire hydrants are generally only capable of providing flows of 1,500 to 2,000 gpm, and multiple hydrants would need to be used to achieve higher flow rates. Further discussion of these fire flow constraints is presented in Chapter 5, Distribution System.

Flow rates for fire suppression in residential, commercial, and industrial areas within developed communities are usually determined from the size, density, and occupancy of buildings, type of construction materials, and the desired fire insurance rating. Incorporated cities and some rural areas are given a fire suppression rating by ISO. The rating is often used by insurance companies to determine the cost for providing fire insurance to home and business owners. ISO's fire suppression rating schedule is used to review those features of available public fire protection that have a significant influence on minimizing damage once a fire has occurred. These features include the receiving and handling of fire alarms, the fire district's manpower, equipment and training, and the capability of the water system to provide the needed fire flows.

ISO periodically evaluates fire suppression capabilities of incorporated cities and rural fire districts. The numerical ratings range from Class 1 down to Class 10, with a Class 1 indicating the highest fire suppression capability and Class 10, the lowest. A Class 10 rating is reserved for unprotected areas that have no fire department and no water supply system. Most protected areas outside of cities have a Class 9 rating, and most small rural cities with municipal water systems are rated Class 8, 7, or 6, depending on the strength of their water system and fire department. The ISO rating for Milton-Freewater, based on the April 8, 1987, tests, is Class 4, which is a good rating for a rural community the size of Milton-Freewater. Again, the ISO rating information is presented in Appendix C.

ISO's fire suppression rating schedule evaluates the City's capability and the domestic water supply on an approximately equal basis (50 percent and 40 percent of the rating schedule, respectively). In order to reduce the cost of fire insurance in a community, improvements usually must be made to the fire department, the water system, or both, depending on their present condition. It is difficult to determine possible fire insurance savings on commercial buildings, because the insurance costs are determined by many other factors related to the type of occupancy and the type of building construction. When implemented, the proposed improvements outlined in this study could reduce water system deficiencies and possibly improve the City's ISO fire protection rating. However, the City of Milton-Freewater already has a good rating, and improving the rating may be difficult.

ISO also recommends fire flows for various conditions in both residential and commercial settings. Recommended fire flows for residential areas are set forth in the 1980 ISO Schedule as shown below.

Distance Between Buildings	Required Fire Flows
Over 500 feet	500 gpm
31 to 100 feet	750 gpm
11 to 30 feet	1,000 gpm
10 feet or less	1,500 gpm

Recommended fire flows for commercial buildings are based on many factors including building size, construction materials used, and what is housed in the building.

The Uniform Fire Code (UFC) requires a flow of 1,000 gpm in residential areas and 1,500 gpm for 2 hours minimum in all other occupancies. These requirements increase with square footage of the building and can be quite large for commercial and institutional buildings (i.e., schools). These fire flows must be maintained with a system-wide minimum of 20 psi residual pressure. Based on the fire flow tests shown in Table 2-2, it appears the City is meeting the elevated fire flow requirements of the commercial and institutional buildings where tests were performed. However, attaining the required fire flows for areas on the outskirts of town with high flow requirements may require substantial improvements to the water system in Milton-Freewater. The City is encouraged to evaluate the existing water system with any new commercial, industrial, or institutional buildings being developed in the City to identify distribution system improvements that may be required to facilitate the new development. The UFC does have an allowance for decreases in fire flows for small communities (if approved by the local fire chief), where development of full fire flow is impractical.

As shown by the ISO tests, the minimum fire flow protection recommended by ISO is 750 gpm for residential areas. ISO recommends a maximum fire flow requirement of 3,500 gpm. The fire flow design criteria for this Water System Master Plan are based on the maximum fire flow recommended by ISO, which is a 3,500 gpm fire flow for a two-hour duration.

DESIGN CRITERIA

In establishing design standards for a water system, primary consideration must be given to state and federal rules and regulations governing water quality and construction standards for water systems. As stated previously, these regulations are set by both the EPA and the DWP. In addition to these public health and safety requirements, many other factors control the design parameters for municipal water systems. The City must evaluate factors such as financial feasibility, philosophy and policies of the City Council, past system performance and service, and expectations of the water users. All of these factors are important and can influence the standards by which water system improvements are made.

Tables 2-3 and 2-4 present a summary of the water system design criteria for evaluating the existing water system and developing improvements to satisfy present and future needs. The application of these criteria is discussed further in the specific chapters that address the water supply, storage, and distribution system facilities. The tables present design criteria based on the present service population of 6,550, present estimated average and maximum daily demands, and present the year 2028 design criteria based on a 2.0 percent growth per year in the area. The storage volumes presented in Table 2-4 are explained and developed in Chapter 4.

COMPARATIVE WATER USAGE

TYPICAL FOR SMALL CITIES IN EASTERN WASHINGTON AND EASTERN OREGON

METERED SYSTEMS

City	Average Daily Flow (gpcd)	Peak Daily Flow (gpdc)	Peak Factor (peak daily)	Population
Hermiston, Oregon	170	410	2.4	12,165
Island City, Oregon	190	550	2.9	925
Adams, Oregon	195	625	3.2	265
Irrigon, Oregon	200	600	3.0	900
Baker City, Oregon	215	660	3.1	10,155
Stanfield, Oregon	217	705	3.2	1,620
Prairie City, Oregon	234	549	2.3	1,195
Mt. Vernon, Oregon	240	585	2.4	617
Prescott, Washington	240	1,032	4.3	300
Athena, Oregon	250	810	3.2	1,120
La Grande, Oregon	266	735	2.8	12,885
John Day, Oregon	270	864	3.2	2,010
Milton-Freewater, Oregon	**300**	**750**	**2.5**	**6,550**
Helix, Oregon	323	1,130	3.5	155
Vale, Oregon	328	820	2.5	1,500
Arlington, Oregon	360	1,200	3.3	500
Ione, Oregon	461	1,865	4.0	250
Ontario, Oregon	530	1,015	1.9	10,910

ISO FIRE FLOW TESTS

April 8, 1987

Test No.	Location (Intersection)	Pressure (psi) Static	Pressure (psi) Residual[1]	Discharge (gpm) Observed	Discharge (gpm) Available @ 20 psi	Discharge (gpm) Required @ 20 psi	Remarks
1.	S.E. 15th Avenue and S. Main Street	89	53	1,590	4,400	2,500	12-inch Main, Middle Reservoir
2.	S.W. 13th Avenue and Davis Street	42	37	1,030	2,300	1,000	6-inch Main, Middle Reservoir
3.	S.W. 6th Avenue and S. Main Street	77	70	1,820	5,600	1,750	12-inch Main, Middle Reservoir
4.	S.W. 2nd Avenue and DeHaven Street	89	80	2,040	6,100	3,000	12-inch Main, Middle Reservoir
5.	E. Broadway Avenue east of S. Main Street	68	60	1,690	4,400	2,250	8-inch Main, North Reservoir
6.	N.W. 6th Avenue and Evans Street	80	78	2,090	13,100	3,000	8-inch Main, North Reservoir
7.	N.W. 7th Avenue and Lamb Street	80	75	2,000	7,700	2,500	12-inch Main, North Reservoir
8.	Lamb Street south of Powell Road	89	74	1,870	4,300	1,250	6-inch Main, North Reservoir
9.	N.W. 8th Avenue and Main Street	83	79	1,090	4,800	3,000	12-inch Main, North Reservoir
10.	N.E. 5th Avenue and Russell Street	73	70	1,400	6,600	1,750	12-inch Main, North Reservoir
11.	N. Elizabeth Street south of N.E. 6th Court	76	71	2,050	7,600	1,000	12-inch Main, North Reservoir
12.	N.E. 10th Street and N. Elizabeth Street	81	78	580	3,000	2,500	12-inch Main, North Reservoir
13.	N. Columbia Street north of N.E. 1st Avenue	65	58	1,640	4,500	2,500	8-inch Main, North Reservoir

Footnotes: [1] Residual pressures of 20 psi are required by ISO and by the DWP.

ISO = ISO Commercial Risk Services, Inc.
DWP = Oregon Department of Human Services - Drinking Water Program

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SUMMARY OF DESIGN CRITERIA
WATER SUPPLY

	Year 2008	Year 2028
Design Population[1]	6,550	9,750
SUPPLY		
Average Daily Demand	300 gpcd	300 gpcd
Average Daily Flow	1,965,000 gpd (1,364 gpm)	2,925,000 gpd (2,031 gpm)
Peak Daily Demand[2]	750 gpcd	750 gpcd
Peak Daily Flow[2]	4,912,500 gpd (3,411 gpm)	7,312,500 gpd (5,078 gpm)
Peak Hourly Flow [3]	8,528gpm	12,695 gpm
Supply Flow Required[4]	4,548gpm	6,771 gpm
Available Supply Flow[5]	7,520 gpm	7,520 gpm
Fire Demand		
Residential	750 gpm	750 gpm
Commercial/Public/Industrial	2,000 - 3,500 gpm	2,000 - 3,500 gpm
Duration	2 hrs	2 hrs
Minimum Residual Line Pressure Under Peak Demands Plus Fire Flow	20 psi	20 psi

Abbreviations:

gpd = gallons per day

gpcd = gallons per capita per day

psi = pounds per square inch

gpm = gallons per minute

hrs = hours

Notes:

[1] Year 2008 population is July 1, 2007, projection by Portland State University Population Research Center

[2] Based on peak daily flow records for 2007

[3] 2.5 times peak daily demand (hourly records not available)

[4] Assumes 18-hour maximum well operation per day to meet peak daily flow demand

[5] Sum of all City wells' production capacities

anderson perry & associates, inc.

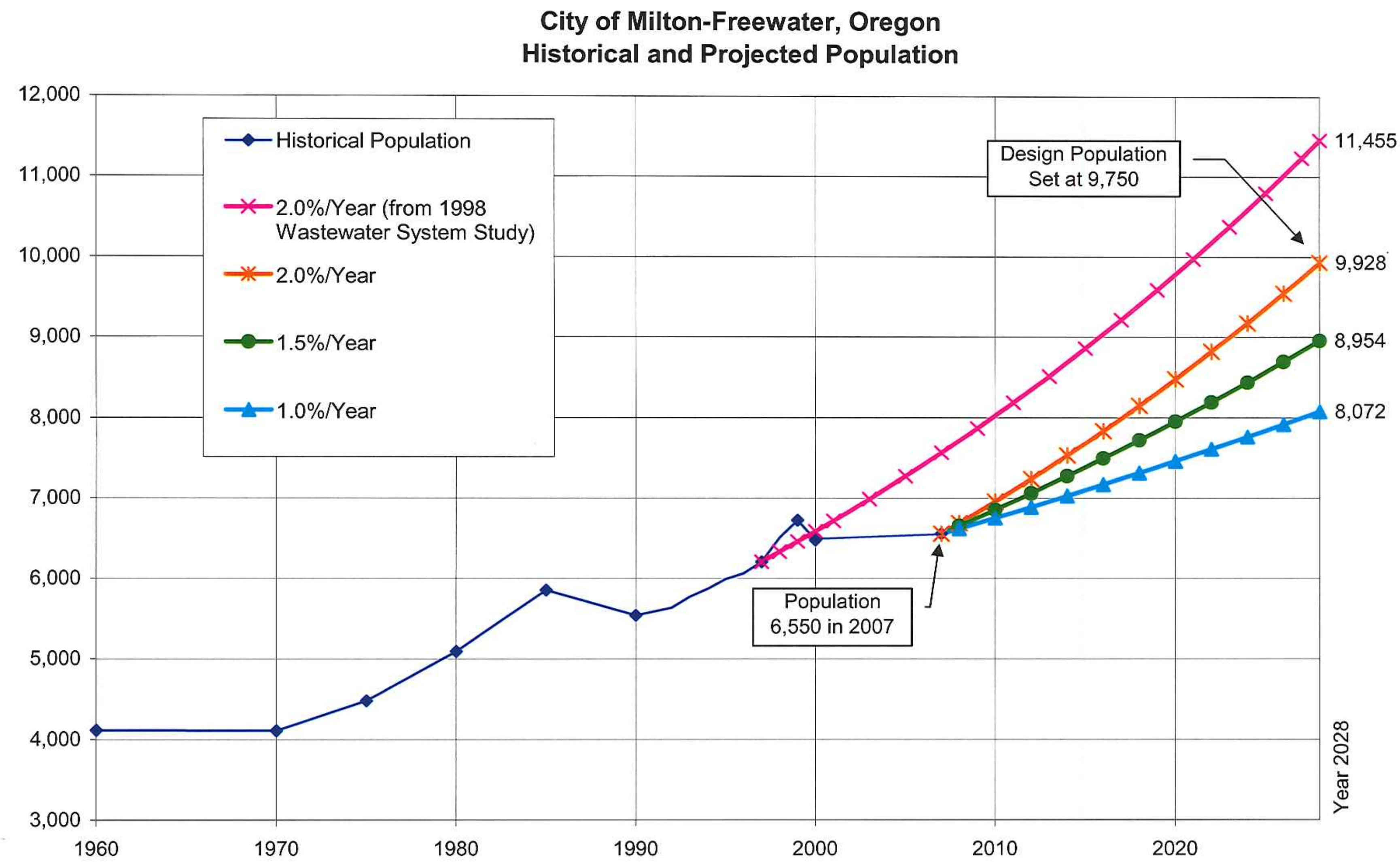
CITY OF
MILTON-FREEWATER, OREGON
WATER SYSTEM MASTER PLAN
SUMMARY OF DESIGN CRITERIA
WATER SUPPLY

TABLE
2-3

SUMMARY OF DESIGN CRITERIA
FOR STORAGE RESERVOIRS[1]

	Year 2028
Design Population	9,750
NORTH SYSTEM STORAGE REQUIREMENTS	
Equalization Storage	404,700 gal.[2]
Operating Storage	190,400 gal.
Fire Reserve (3,500 gpm, 2-hour duration)	420,000 gal.
Emergency Reserve	1,413,000 gal.
Total, North	**2,428,100 gal.**
MIDDLE SYSTEM STORAGE REQUIREMENTS	
Equalization Storage	371,700 gal.
Operating Storage	128,700 gal.
Fire Reserve (3,500 gpm, 2-hour duration)	420,000 gal.
Emergency Reserve	1,413,000 gal.
Total, Middle	**2,333,400 gal.**
SOUTH SYSTEM STORAGE REQUIREMENTS	
Equalization Storage	0 gal.
Operating Storage	338,400 gal.
Fire Reserve (3,500 gpm, 2-hour duration)	420,000 gal.
Emergency Reserve	99,000 gal.
Total, South	**857,400 gal.**
TOTAL STORAGE REQUIREMENTS	
Equalization Storage	776,400 gal.
Operating Storage	657,500 gal.
Fire Reserve	1,260,000 gal.
Emergency Reserve	2,925,000 gal.
TOTAL	**5,618,900 gal.**

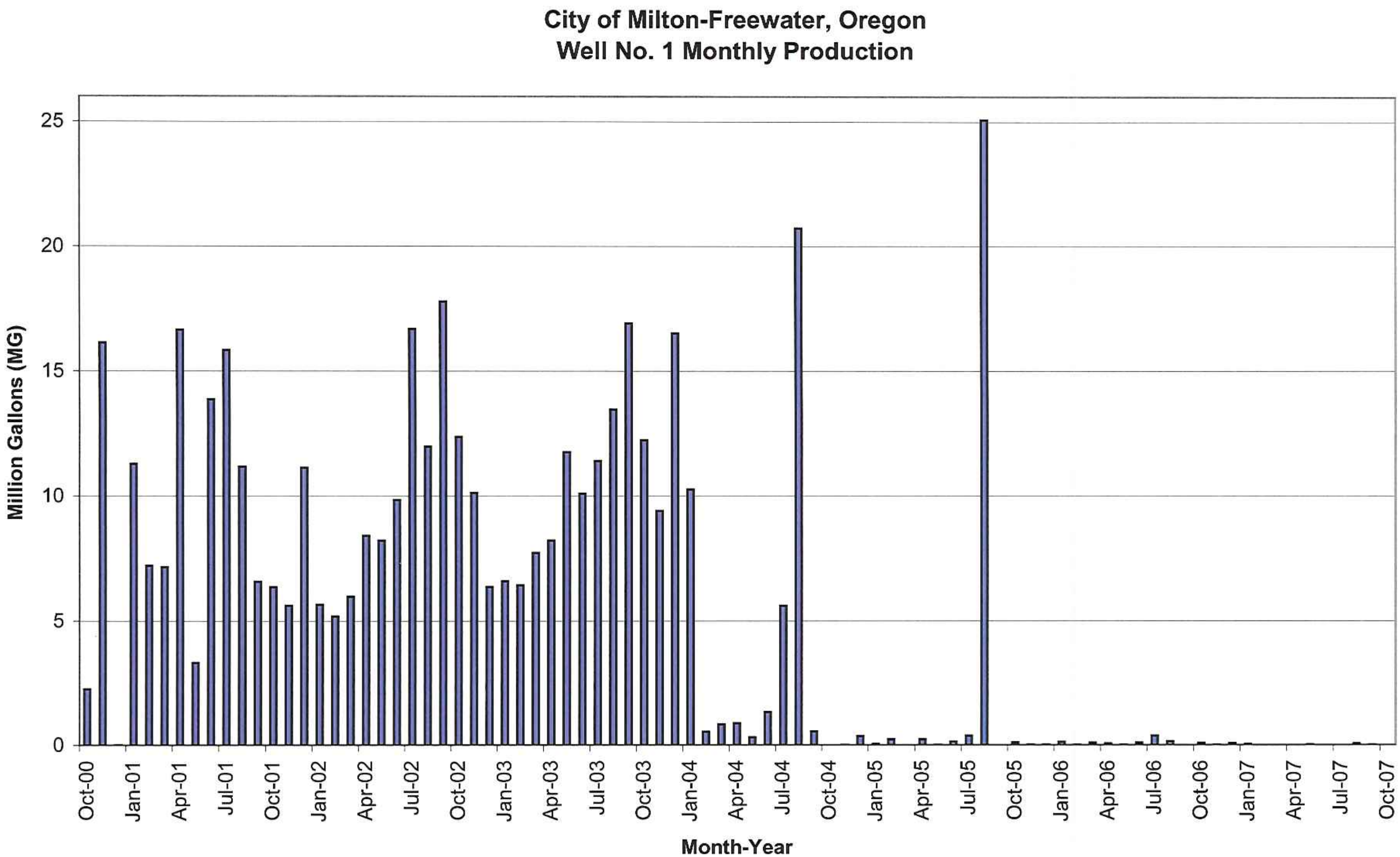
Notes:
[1] Storage requirements are explained and developed in Chapter 4, Water Storage
[2] gal. = gallons



anderson perry & associates, inc.

CITY OF
MILTON-FREEWATER, OREGON
WATER SYSTEM MASTER PLAN
HISTORICAL AND PROJECTED POPULATION

FIGURE 2-1



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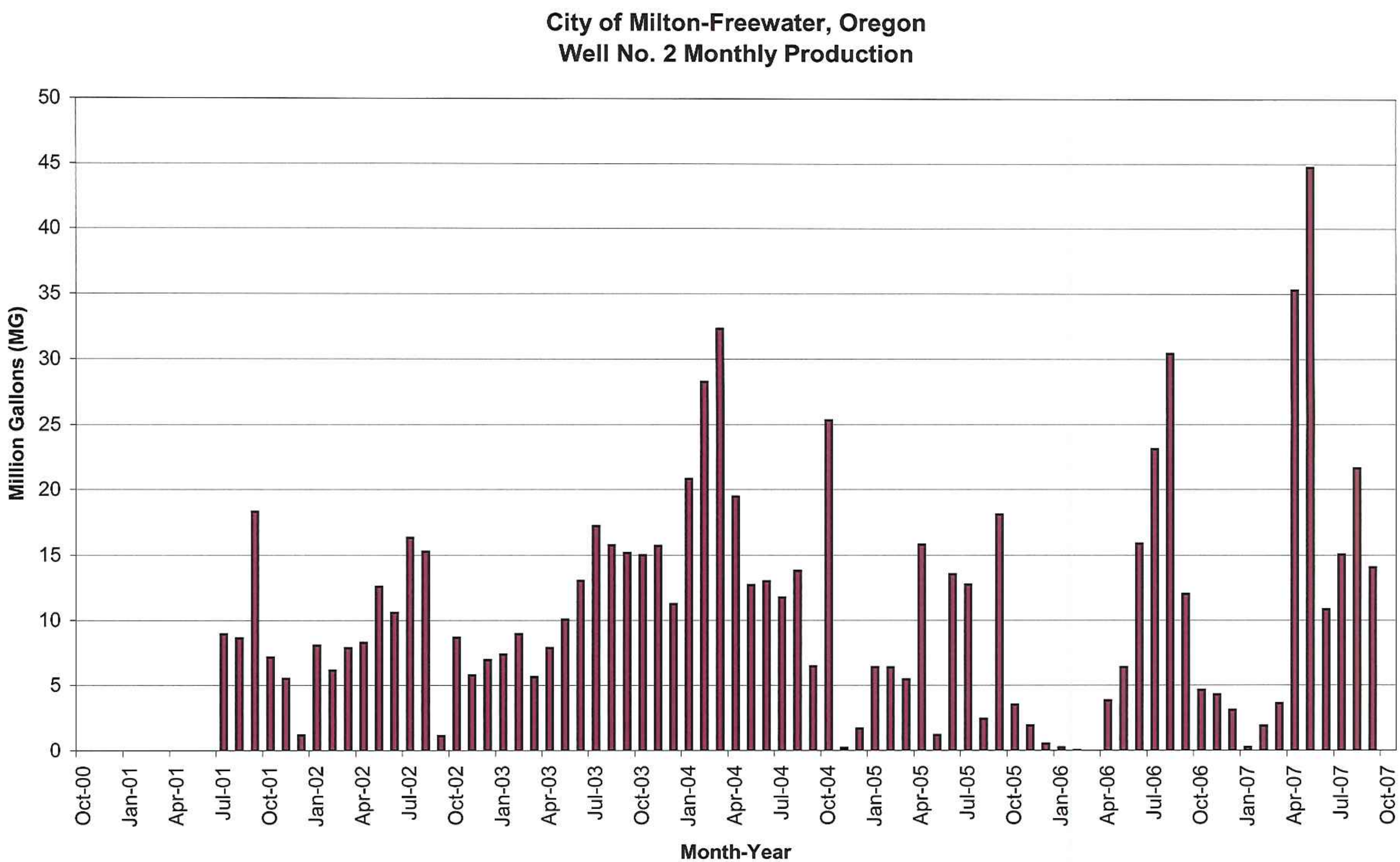
CITY OF
MILTON-FREEWATER, OREGON
WATER SYSTEM MASTER PLAN
WELL NO. 1
MONTHLY PRODUCTION

FIGURE 2-2



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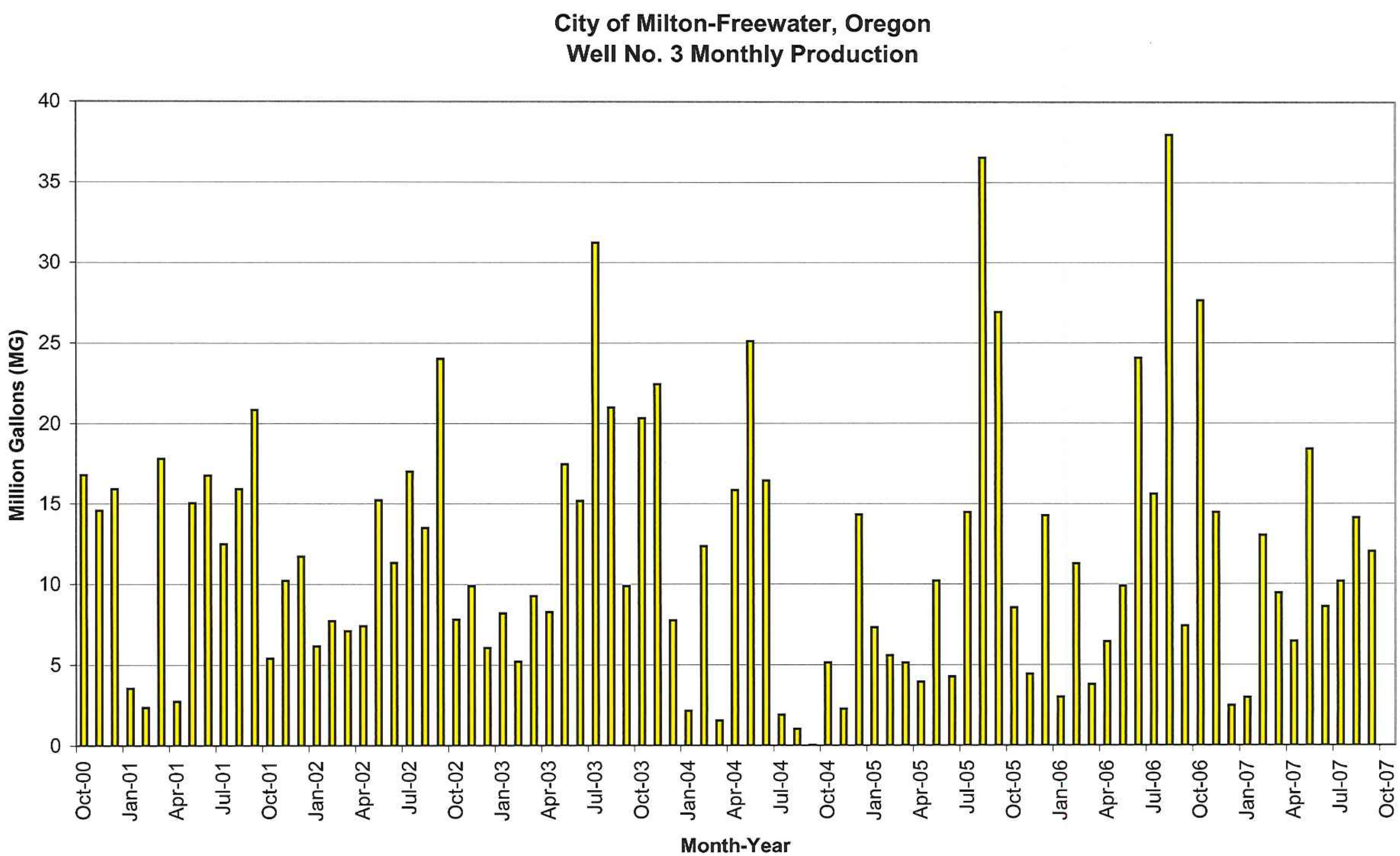
CITY OF
MILTON-FREEWATER, OREGON
WATER SYSTEM MASTER PLAN
WELL NO. 2
MONTHLY PRODUCTION

FIGURE 2-3



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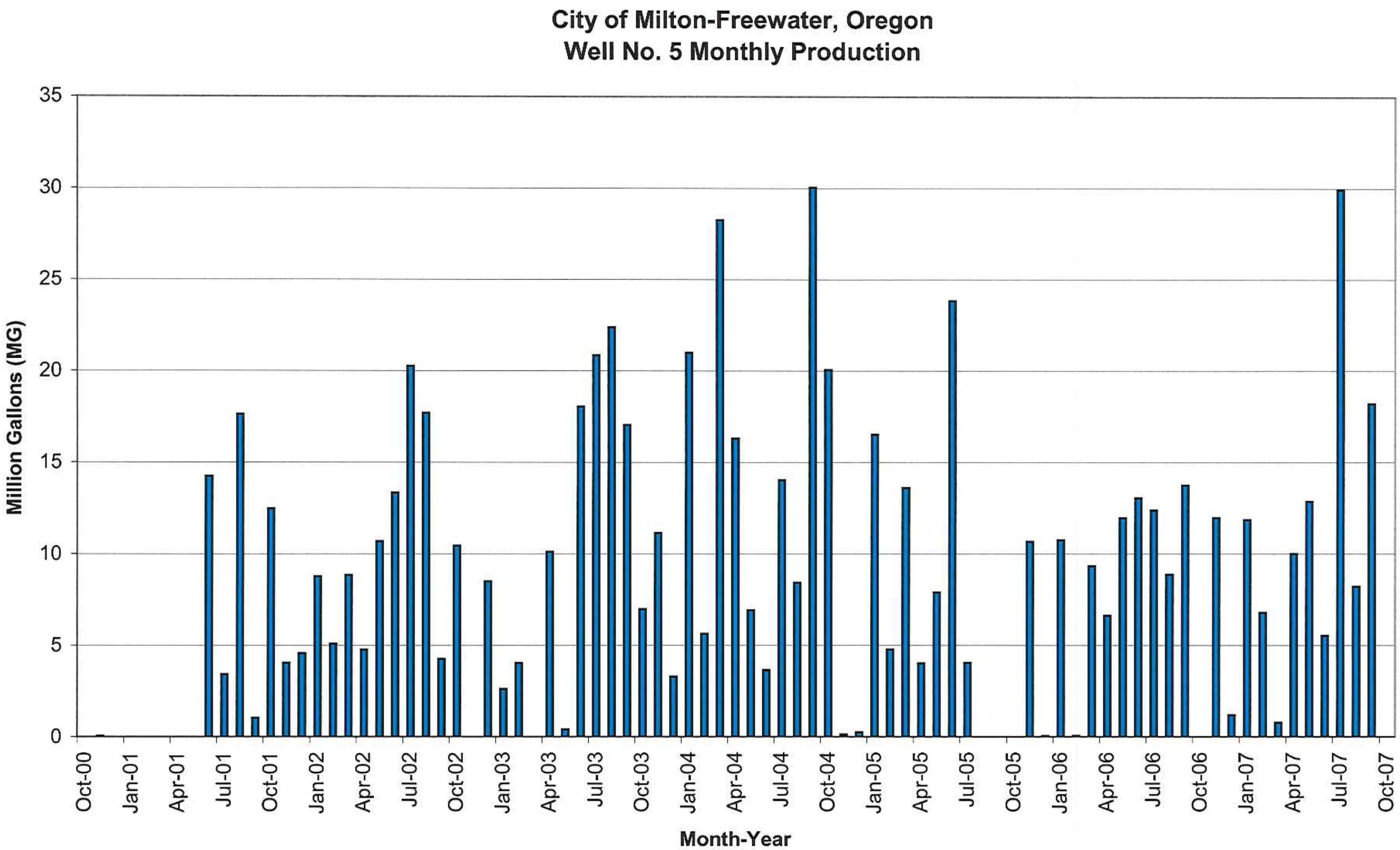
CITY OF
MILTON-FREEWATER, OREGON
WATER SYSTEM MASTER PLAN
WELL NO. 3
MONTHLY PRODUCTION

FIGURE
2-4



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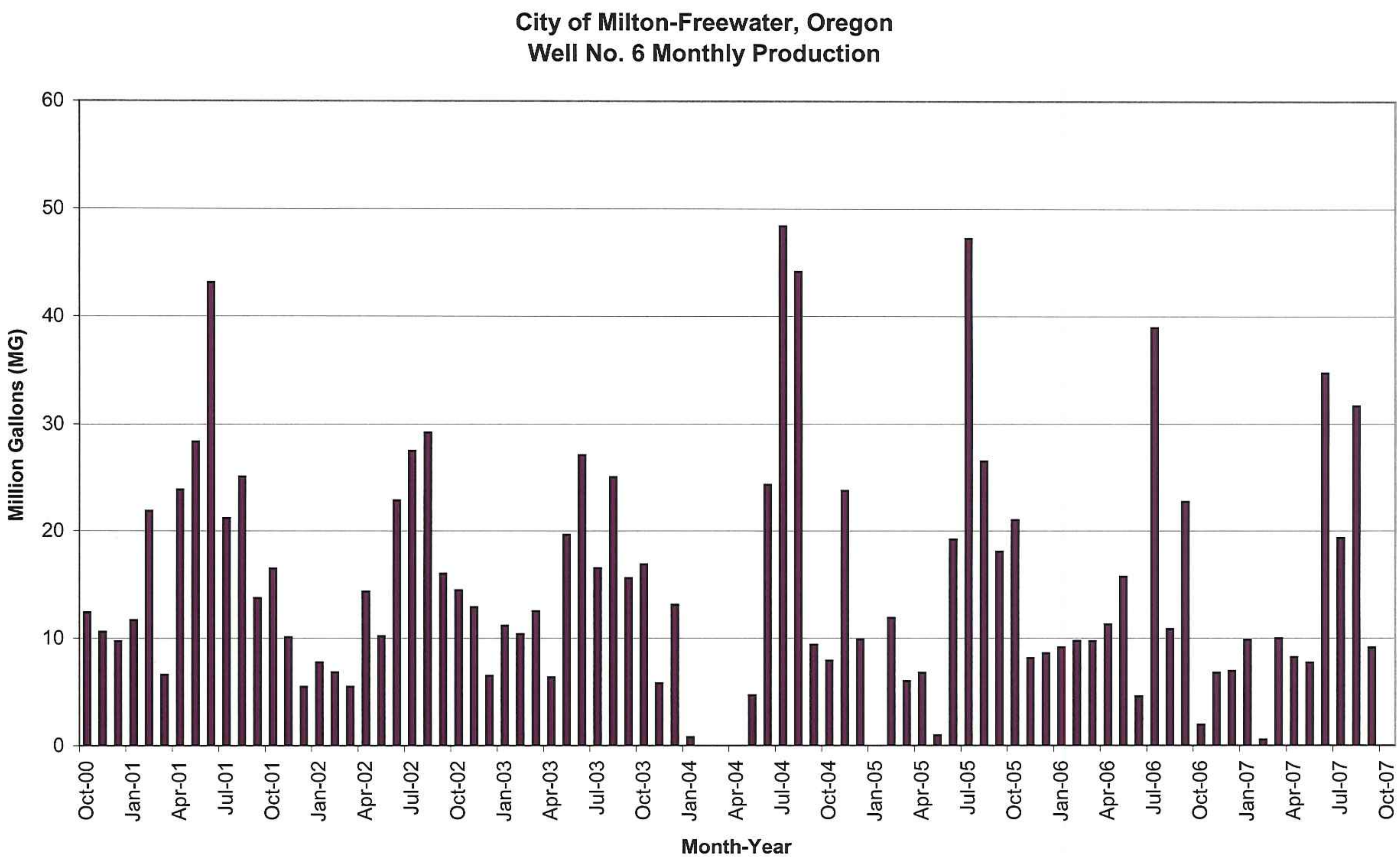
CITY OF
MILTON-FREEWATER, OREGON
WATER SYSTEM MASTER PLAN
WELL NO. 5
MONTHLY PRODUCTION

FIGURE
2-5



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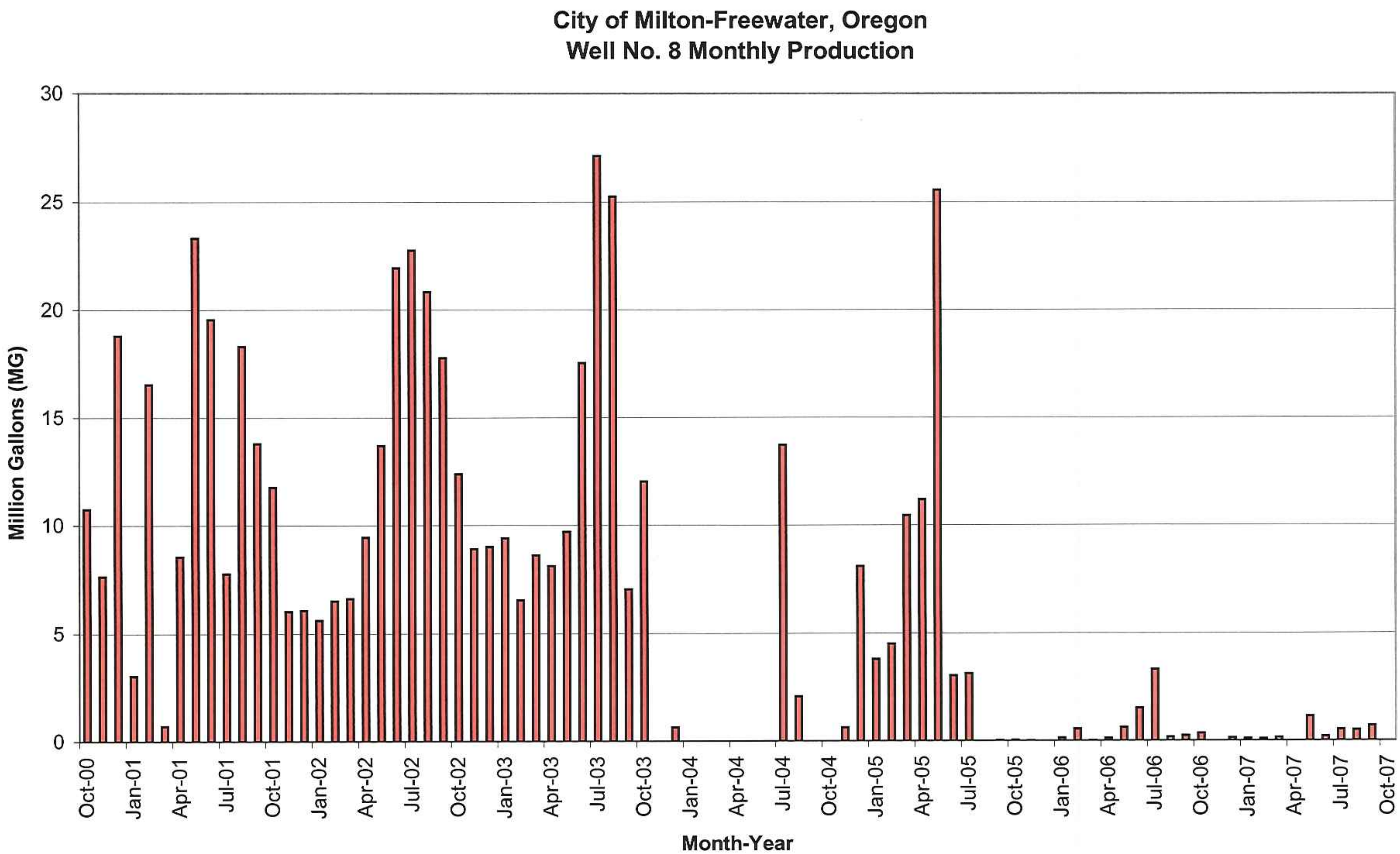
CITY OF
MILTON-FREEWATER, OREGON
WATER SYSTEM MASTER PLAN
WELL NO. 6
MONTHLY PRODUCTION

FIGURE
2-6



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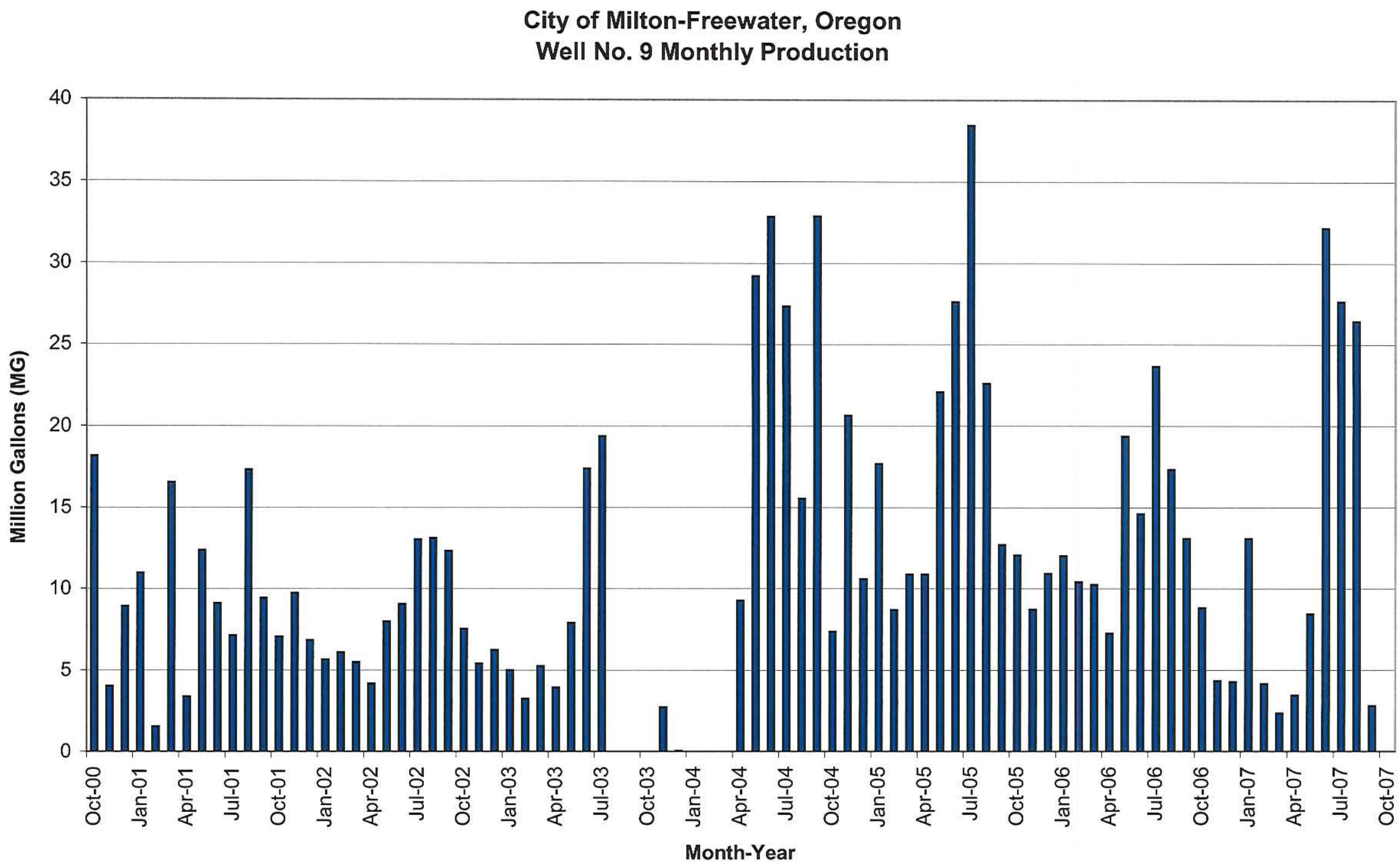
CITY OF
MILTON-FREEWATER, OREGON
WATER SYSTEM MASTER PLAN
WELL NO. 8
MONTHLY PRODUCTION

FIGURE
2-7



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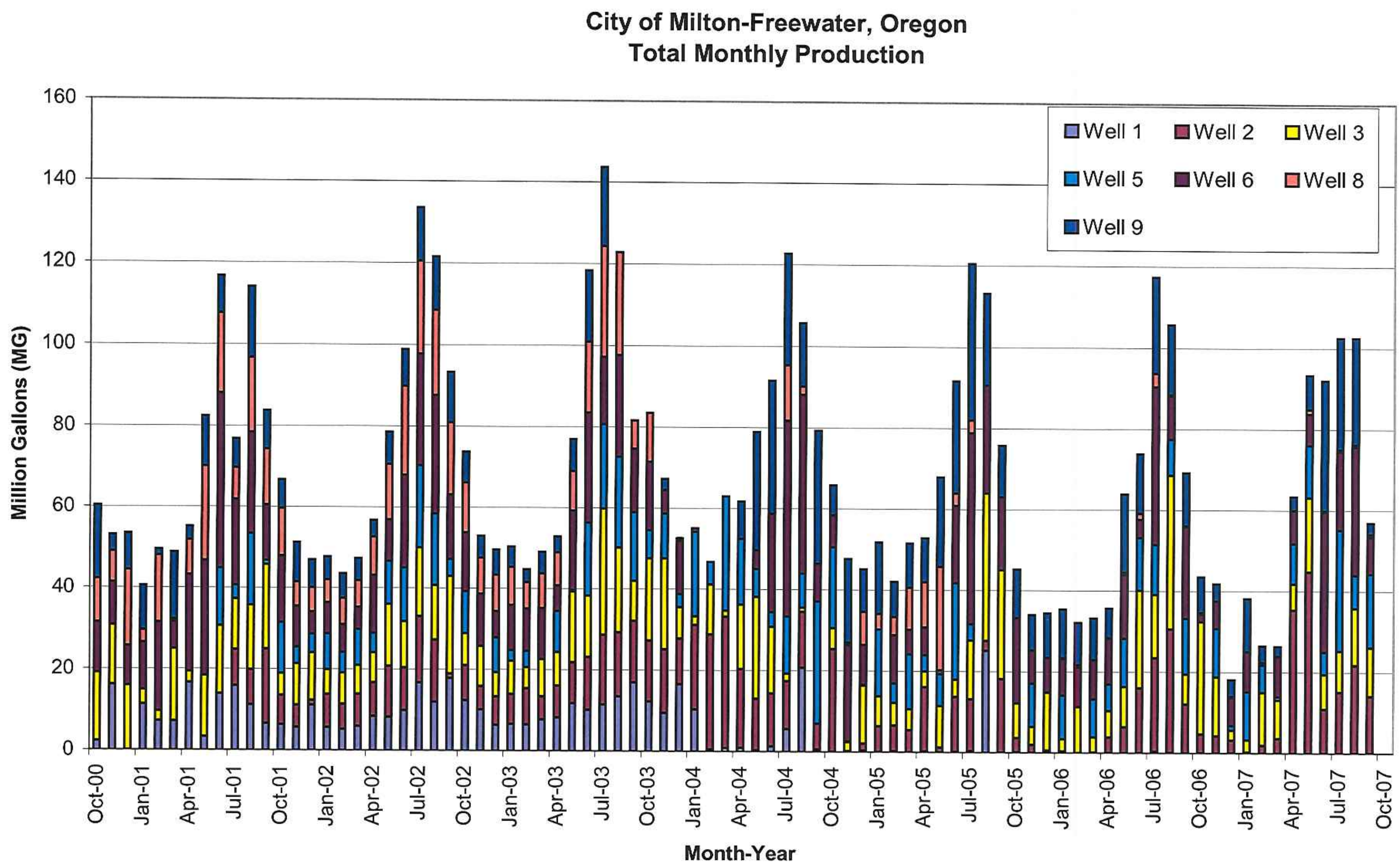
CITY OF
MILTON-FREEWATER, OREGON
WATER SYSTEM MASTER PLAN
WELL NO. 9
MONTHLY PRODUCTION

FIGURE
2-8



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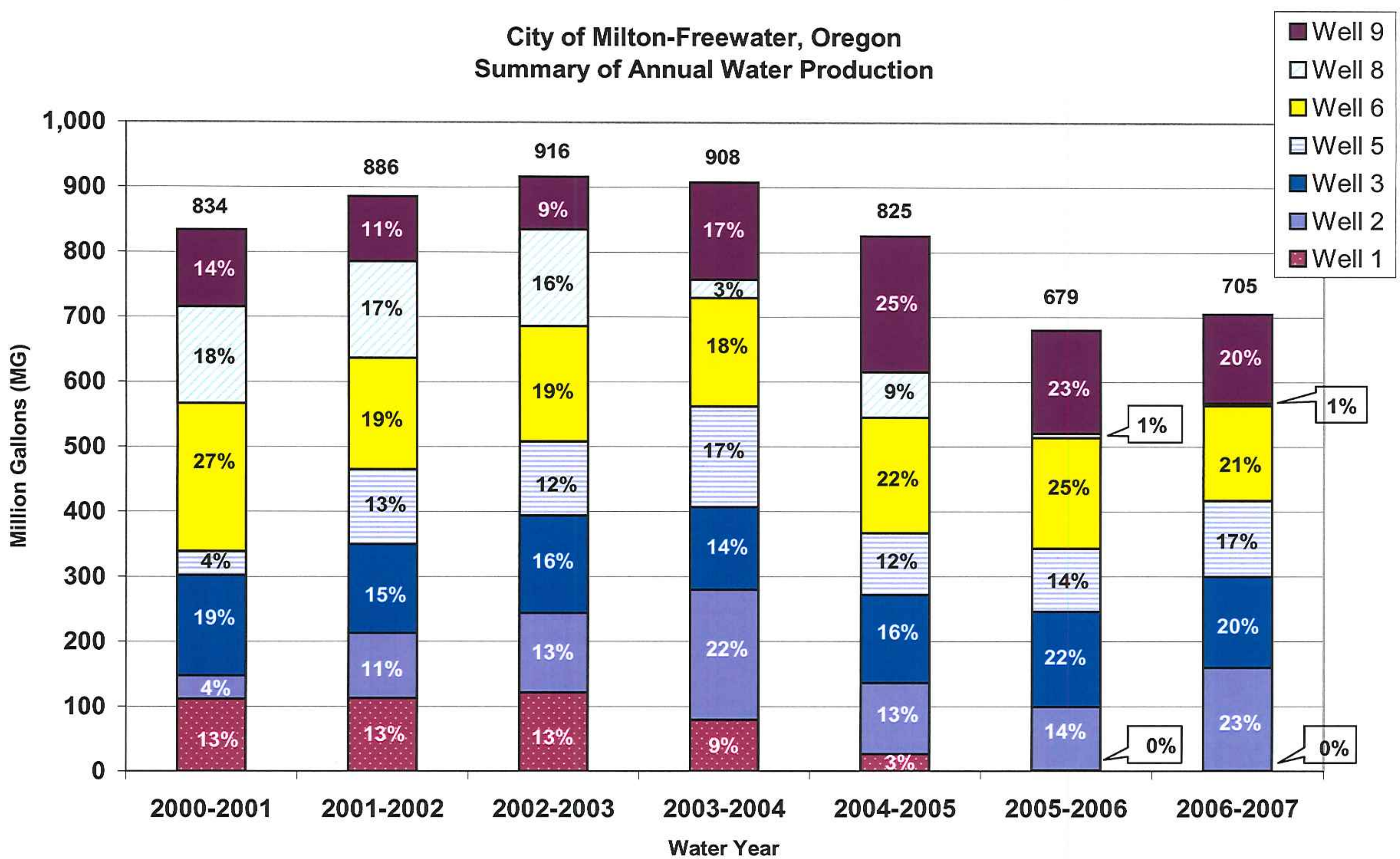
CITY OF
MILTON-FREEWATER, OREGON
WATER SYSTEM MASTER PLAN

TOTAL MONTHLY PRODUCTION

FIGURE 2-9



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CITY OF
MILTON-FREEWATER, OREGON
WATER SYSTEM MASTER PLAN
SUMMARY OF ANNUAL
WATER PRODUCTION

FIGURE
2-10

CHAPTER 3

WATER SUPPLY AND TREATMENT

INTRODUCTION

This chapter includes a description of the City's present water supply system and a discussion of its capacity to meet present and future needs. Recommendations to address needs of the present system and for meeting future needs are outlined. Cost estimates for the recommendations are presented in Chapter 6, Recommended System Improvements.

PRESENT WATER SUPPLY

The City of Milton-Freewater draws water from basalt aquifers using seven wells ranging in depth from 502 feet to 1,051 feet. Generally, the City's wells provide good quality water; however, the City has experienced an entrained air problem with some of the wells. The City also has a surface water right to the Walla Walla River with a priority date of 1887 that has not been used for almost 50 years. In the past, the City used a sand filter treatment facility to provide treatment of Walla Walla River water prior to supplying the water to City users. The treatment plant was abandoned because of rising operating costs.

Additional detail and a history of the improvements made to the City's water sources is outlined hereafter.

City Wells. General information related to the City's wells is provided on Table 3-1, and the location of each well is presented on Figure 1-2 in Chapter 1. Appendix D also contains well logs for each of the City's wells. The following information is provided in order to summarize maintenance that has been completed and problems that have arisen with each of the City's wells, and their current status.

Well No. 1. Well No. 1 was extended 15 feet in 1971 to a depth of 651 feet and rehabilitated by the Layne Bowler Pump Company. The well is one of the oldest in town and is currently not regularly operated to meet City demands due to an air entrainment problem.

Well No. 2. Well No. 2 was rehabilitated in May of 1988 by the Layne Pump Company. The well was shut down in 1993 due to aeration problems developing in the water. This well has been continually monitored by the City since it developed air entrainment in 1990. It has been videotaped several times in order to determine the source of the air entrainment. A separate discharge line was routed from Well No. 2 to the Middle Reservoir in 2001 to facilitate removal of entrained air. Well No. 2 is currently used to provide 15 to 23 percent of the City's water supply.

Well No. 3. Well No. 3 was rehabilitated in January of 1991 and shut down in March of 1993 due to aerated water problems. An attempt to seal the aquifer and set the pump column to a greater depth was undertaken after the well was taken off line. However, the sealing effort failed to stop the aeration problem and a new transmission line was constructed in 1999 to allow the well to discharge to the North Reservoir, as discussed in the Air Entrainment section later in this chapter. Well No. 3 is currently used to provide 20 to 22 percent of the City's water supply.

Well No. 5. Well No. 5 was deepened 10 feet in 1980. The well was rehabilitated in 2000. It is believed that the principal aquifer is located in the bottom 30 feet of the hole (below 470 feet depth). This is the oldest well in the City and saw increased production in 1998 and 1999, accounting for approximately 30 percent of the City's annual water production during that period. This well developed air entrainment problems in September 2000 and a separate discharge into the North Reservoir was constructed in 2001. Well No. 5 is currently used to provide about 14 to 17 percent of the City's water supply.

Well No. 6. Well No. 6 was rehabilitated in 1992. The hole is crooked and placing the original column was difficult. Well No. 6 also developed air problems and a separate discharge into the North Reservoir was constructed in 1999. This well is currently used to provide about 21 to 25 percent of the City's water supply.

Well No. 8. Well No. 8 was originally 888 feet deep and was deepened to 1,051 feet in 1970, becoming the City's deepest well. The well was rehabilitated in 1969 and 1970. This well is the most recently drilled well in the City and currently provides very little supply because it is the least efficient well to operate.

Well No. 9. Well No. 9 was acquired by the City in 1993 after previously being owned and operated by the Umatilla Canning Company. The last rehabilitation of the well was completed in 1997. This well serves both the Middle and South Pressure Zones through separate control systems for the primary pump and a separate set of booster pumps. The primary pump is controlled by system controls at the Middle Reservoir while the booster pumps are controlled by system controls at the South Reservoir. Well No. 9 is currently used to provide about 20 to 23 percent of the City's water supply.

Surface Water. The City's surface water diversion and treatment system on the Walla Walla River was last used in 1959. When it was used, the water was treated via a slow sand filter plant with a 1,200 gallon per minute (gpm) capacity. The plant was shut down due to comparatively high water production costs and water quality limitations. The plant continues to be inoperative at this time.

Treatment. Currently, the City has chlorine treatment facilities in place for all active supply wells. All of the City's seven wells (Wells No. 1, 2, 3, 5, 6, 8, and 9) have hypochlorite disinfection systems.

Controls. Operation of each of the wells is controlled by pressure transducers located in the respective pressure zone reservoirs. The transducer systems of each reservoir are routed to a transmitter via dedicated overhead phone lines. The City has indicated that it is pursuing replacement of the existing telephone-based telemetry system with a radio system.

The North Pressure Zone wells, consisting of Wells No. 3, 5, and 6, are controlled by water levels in the North Reservoir. The primary well (Well No. 3) is activated when the reservoir water level drops 7 feet below full. If the level continues to drop to 13 feet below full, the secondary well pump (Well No. 6) is activated. If the reservoir water level drops to 20 feet below full, the pump of Well No. 5 is activated. As the reservoir is filled, pumps are deactivated until the primary pump is the only one pumping, which turns off when the water level reaches within 3 feet of the reservoir's full capacity.

The Middle Pressure Zone wells, consisting of Wells No. 1, 2, 8, and 9, are controlled by water levels in the Middle Reservoir. The primary well (Well No. 2) is activated when the reservoir water level drops 4.5 feet below full. If the water level continues to drop to 7.5 feet below full, the Well No. 8 or 9 pump is activated. The final pump (either Well No. 8 or 9) is activated when the water level drops 10.5 feet below full. As the reservoir is filled, pumps are deactivated until the primary pump is the only one pumping, which turns off when the water level reaches within 1.5 feet of the reservoir's full capacity. Well No. 3 can also be used to provide water supply to the Middle Pressure Zone.

The South Pressure Zone supply, consisting of two booster pumps located in the Well No. 9 well house, is controlled by water levels in the South Reservoir. The pumps are alternately activated when the reservoir water level drops 17.5 feet below full. If the level continues to drop to 18.5 feet below full, the second booster pump is activated. As the reservoir is filled, the booster pumps are deactivated until the water level reaches 13.5 feet below the full reservoir capacity and both pumps are turned off. The reservoir is currently operated in this fashion to ensure high water quality, and operation levels will be adjusted as demand increases in the South Pressure Zone. In order to adequately exchange water in the South Reservoir, a constant 40 gpm flow passes through a pressure reducing valve from the higher elevation South Pressure Zone to the Middle Pressure Zone.

Water Supply Taste/Odor Issues. Generally, the City of Milton-Freewater has a good water supply without significant taste or odor problems. Occasionally a complaint of stagnant water is received, which is resolved by City crews flushing lines in areas with inadequate looping. The City also receives approximately 20 complaints per year of chlorine odor in areas of dead-end distribution lines. These complaints are similarly resolved by flushing lines.

Though not a taste or odor problem, the City has had complaints of water with a "milky" appearance. This began when wells first started pumping air-entrained water into the distribution system during periods of heavy pumping. Water transmission lines have been constructed from Wells No. 2, 3, 5, and 6 to feed directly to the reservoirs, allowing the air to dissipate at atmospheric pressure in the reservoirs.

WATER RIGHTS

The City of Milton-Freewater holds groundwater and surface water rights issued by the State of Oregon for each of its supply sources. Copies of these water rights are included in Appendix E. All of the City's wells are utilized at a rate less than the allowed flow volume under the associated water rights. A summary of the water rights information is listed in the following table.

WATER RIGHTS

Water Source	Application Number	Permit Number	Certification Number	Allowed Flow Volume (cfs/gpm)*	Priority Date
Well No. 1	U-109 G-5389	U-102 G-4924	12070	1.5 / 673 2.0 / 898	1/18/37 1/4/71
Well No. 2	U-159	U-150	15548	3.0 / 1,346	2/28/44
Well No. 3	U-191	U-172	16998	3.5 / 1,571	1/10/46
Well No. 5	U-809	U-718	23533	2.7 / 1,212	4/13/55
Well No. 6	U-511	U-462	23519	3.5 / 1,571	7/16/52
Well No. 8	G-2502	G-2312	41011	3.9 / 1,750	12/13/62
Well No. 9	G-13494	G-12582	20806	3.3 / 1,481	8/16/93
Walla Walla River	--	D-12920	12920	7.24 / 3,245	1890

* cfs = cubic feet per second

WATER SUPPLY ANALYTICAL TESTING

Water quality analytical results for the City's wells were obtained from the Drinking Water Program (DWP) website database. Since the majority of the wells have isolated discharge lines into the reservoirs, the City of Milton-Freewater is able to obtain water quality samples from a single sampling point that is representative of water quality from several wells. This has allowed the City to reduce the number of sampling points for their seven wells to four locations, as summarized hereafter. The entry points into the water system, or EPs, are identified in the DWP database as A, B, C, and D.

- Wells No. 1 and 2 entry point (EP-A)
- Wells No. 3, 5, and 6 entry point (EP-B)
- Well No. 8 entry point (EP-C)
- Well No. 9 entry point (EP-D)

The wells, or entry points, have been sampled for the constituents required by the DWP, including total and fecal coliform, volatile organic compounds (VOCs), synthetic organic compounds (SOCs), seven pesticides, gross alpha, nitrate, nitrite, nitrate-nitrite, sulfate, cyanide, fluoride, and metals. Only those constituents detected in the samples at low concentrations are included in the following table along with the corresponding Maximum Contaminant Level (MCL). The period reviewed for the analytical results is from 2002 through currently available data.

WATER SUPPLY ANALYTICAL TESTING SUMMARY DATA
2002 THROUGH PRESENT

Contaminant (MCL, mg/L unless otherwise noted)	Levels of Contaminants Detected (mg/L unless otherwise noted)			
	EP-A (Wells No. 1 and 2)	EP-B (Wells No. 3, 5, and 6)	EP-C (Well No. 8)	EP-D (Well No. 9)
Nitrate (10)	0.70	0.20 to 1.6	0.30	--
Radium (5 pCi)	0.86	0.88	--	--
Uranium (0.30)	0.00011 to 0.00012	--	--	--
Barium (2.0)	0.019	0.0088	0.012 to 0.013	0.022 to 0.024
Fluoride (4.0)	0.20	--	0.40	0.20
Sodium (NA)	14	12	14 to 15	14

pCi = Pico curries
NA = Not applicable

Based on the sample analytical results, the groundwater of the wells that were sampled does not contain bacteriological or chemical constituents at concentrations greater than the corresponding EPA Primary Drinking Water MCLs. The water quality testing summaries were obtained from the DWP website and are presented in Appendix A.

Distribution System Testing. Although the distribution system is discussed in greater detail in Chapter 5, a brief discussion of distribution system sample analytical testing is presented herein for completeness. The City randomly obtains eight routine samples each month from the distribution system for analysis of total and fecal coliform. For the period from July 5, 2001, through November 24, 2008, total and fecal coliform have not been detected in the routine samples. The City also biannually obtains random samples from the distribution system for chemical analysis of total lead and total copper. From 1993 through 2007, all detected concentrations of lead and copper were less than their corresponding EPA Action Levels.

WATER SUPPLY DESIGN CRITERIA

General. As presented in Chapter 2, the planning period for this Water System Master Plan extends to the year 2028. The estimated population of Milton-Freewater, as of July 1, 2007, was 6,550, and the projected population for the year 2028 is 9,750. The peak daily water demand is estimated to be 5,078 gpm in the year 2028, while the current peak daily demand is estimated to be 3,411 gpm.

Generally, water supply facilities are designed to meet peak daily demands. These facilities should normally be sized to supply the peak daily demand without 24-hour service. If these facilities are wells, it is preferred that well pumps operate a maximum of 18 hours per day, if possible.

Well Operation. Many communities in Eastern Oregon rely upon wells as their primary water source, and wells have proven to be dependable and reliable in meeting the water supply needs of these communities. The City of Milton-Freewater has developed a system of wells that effectively serves the City's current water needs. The total production available from all of the City's wells is approximately 7,520 gpm. Discounting the capacity of Well No. 1 due to minimal use of the well because of entrained air problems, the total production reduces to 6,690 gpm. This current production rate meets the current estimated peak daily demand of 3,411 gpm by operating just under 12 hours per day. The projected peak daily demand of 5,078 gpm in the year 2028 with the same set of wells operating requires just over 18 hours of operation per day. Any extended shutdowns of the actively used wells will also require the use of the entrained air water source (Well No. 1) to meet projected peak daily demands.

Bringing the City's existing Well No. 1 back into regular service by constructing a transmission line from the well to the existing line from Well No. 2 to the North Reservoir would help to reduce the projected 2028 pump operation time. A transmission line connecting the subject well to the reservoir and spilling the water into the reservoir would allow the entrained air to dissipate (as discussed in the Air Entrainment section below). The City has implemented this strategy on other wells with good results. Bringing Well No. 1 back online would alleviate potential high operation hours for the other system wells, reducing pump operation time to meet year 2028 peak daily demands to just over 16 hours. With Well No. 1 back in operation in the City's supply system, it is anticipated that year 2028 peak day demands would be met and operational flexibility would be improved.

Reliability. The reliability of the water supply is one of the most important functions of any water system. Because the health and safety of the community depends upon a reliable water source, high priority should be given to ensure a municipal water system has the ability always to meet the water needs of its customers. A number of factors, such as mechanical failures, power outages, primary water transmission line failures, etc., can affect the reliability of a water supply. It is nearly impossible to ensure 100 percent reliability of any system. However, having proper system components can help ensure long-term reliability. Currently, the City has standby power available at Well No. 2. This provides some reliability for the Middle Pressure Zone in the event of a power outage. Through the pressure reducing valve (PRV) at DeHaven and Broadway, and opening a few normally closed valves, the Middle Pressure Zone can supply water to the North Pressure Zone, providing a level of backup reliability to that zone also. The higher elevation South Pressure Zone does not have standby power or backup water supply sources available, but it does have a large capacity reservoir with fewer uses.

It should be noted that future changes in the City's projected population, water use characteristics, and/or available supply could affect these assumptions. The City should periodically review this information to ensure additional water supply beyond that recommended in this Water System Master Plan is not needed sooner than anticipated to meet the City's demands.

AIR ENTRAINMENT

One problem of concern with the City's water supply is the presence of air in the water. The entrained air readily comes out of solution when brought to atmospheric conditions such as in a reservoir or out of a water tap. However, pumping the water with entrained air directly into the distribution system results in air-related problems and appearance complaints (the water appears milky). Air can also increase other potential water quality problems associated with iron and manganese.

Prior to 1991 the problem was evident in Well No. 2 during periods of high pumping rates. During the summer of 1993 the problem grew worse and could not be eliminated by reducing pumping rates. At that time the well was shut down. Well No. 3 also developed an air entrainment problem in 1992. A video inspection performed at that time revealed that the air was entering the well at a depth of between 251 to 264 feet. A packer was installed to seal off this portion of the well; however, subsequent pump testing showed that there was also an air entrainment problem in the lower aquifer. After testing methods to remove the air from the water at the well site, it was determined that a transmission pipeline connecting Well No. 3 to the North Reservoir should be constructed. This project was completed in 1999. This new line enables the air-entrained water to be discharged to the reservoir and the air to dissipate under the open atmospheric conditions inside the reservoir prior to being conveyed to the distribution system. A separate discharge line into the Middle Reservoir for Well No. 2 was constructed in 2001.

Well No. 6 developed an air entrainment problem and a transmission pipeline connecting this well to the North Reservoir was installed in 1999. The water from Well No. 6 is discharged against a plate before mixing with the reservoir water in an attempt to increase the air dissipation rate. This discharge configuration is working well for the City. The City has also found that Well No. 5 has developed an air entrainment problem. The City has identified that the problem has moved in a northwesterly direction through its well system, which may indicate that Well No. 5 would be the last City well to be affected by the problem. However, additional wells may develop this problem, requiring future action to be taken in order to continue their use. A separate discharge line into the North Reservoir was constructed for Well No. 5 in 2001.

Currently, five wells (No. 1, 2, 3, 5, and 6) are experiencing air entrainment problems. All of these wells (except Well No. 1) have separate discharge lines into their applicable reservoirs.

AREA WELLS

Although the City is not projected to have deficiencies in the water supply system through the year 2028, it is recommended that the City continues to proactively pursue other supply sources as the opportunities arise. With this goal in mind, available copies of well logs from the Oregon Water Resources Department (OWRD) for the Milton-Freewater area were obtained and reviewed for potential City use. The well logs were reviewed considering well location, yield, and depth. Only wells located in Township 5 North, Range 35 East, Sections 1, 2, 11, and 12; Township 6 North, Range 35 East, Sections 35 and 36; and Township 5 North, Range 36 East, Sections 7 and 18 with yields greater than 400 gpm or depths greater than 500 feet were included for discussion in this chapter. The sections reviewed for well logs are located within the City's Urban Growth Boundary (UGB) or immediately adjacent to the UGB. Copies of the well logs for wells in the Milton-Freewater area meeting the assumed criteria are presented in Appendix F.

Information obtained from the well logs was used to complete a very preliminary evaluation of wells in the Milton-Freewater area for planning purposes. Interviews with well owners were not completed to verify the accuracy of the well log information presented herein. In some cases, well logs may not be available or significant alterations may have been completed to a well that are not shown on the well log or not reported to the Oregon Water Resources Department. If well log information is used as a basis for evaluating possible sites for a new well, a more detailed informational search, with personal interviews, should be completed to help verify well log information.

Based on the well log information obtained from the OWRD, ten wells are present in the Milton-Freewater area, outside of the City's wells, that have yields in the neighborhood of 400 gpm or more. Two additional wells with depths greater than 500 feet are present in the area, which have been included in this discussion due to lacking or questionable reported yields. A summary of the well log information is presented in Table 3-2. The estimated well locations are presented on Figure 3-1. It should be noted that the well locations were estimated based on legal descriptions on each log that are to the nearest 40 acres. Therefore, the locations shown on Figure 3-1 should be considered approximate.

The three most promising wells, as far as current yield (Wells A, B, and C), are located in Township 5 North, Range 35 East, Sections 1 and 12. These wells appear to have been used for canning-related operations. The City has acquired Well A and has control of the operation of Well B. Wells A, B, and C range in depth from 528 to 702 feet and provided yields ranging from 1,000 to 1,350 gpm upon completion of drilling. Based on the well log information, well yields of between 500 and 1,000 gpm appear to be attainable by drilling to depths ranging from approximately 300 to 1,000 feet in Sections 1 and 12. Wells drilled at appropriate locations in either of these sections would be very close to the existing distribution system, eliminating the need for a long pipeline from a new well to the distribution system.

STATIC WATER LEVEL TRENDS

Over time, static water levels of a well can be the best indicator of the status of the underlying aquifer. Historically, the City's basalt wells have demonstrated a decline in static water levels. This indicates that groundwater is likely being pumped from the aquifers at a faster rate than recharge can occur. This is probably due in part to the City's use and probably mostly due to significant irrigation use in the area and heavy cannery use in the past. A graphical representation of the decline using available static water level data for each of the wells is shown in Figure 3-2.

The data presented in Figure 3-2 comes from various sources without specific dates of measurement identified. Seasonal fluctuations in static water level impact water level readings throughout the year and, therefore, may have some effect on the presented data. Based on the extended period of time covered by the data and the consistency between wells, the general decline in static levels can be interpreted as being representative of the aquifer's water level.

Indications are that the aquifer is declining over the long term at an average linear rate of 2.5 to 3.4 feet per year. Focusing upon the more recent rates since the mid 1970s, the decline appears to be around 1.5 feet per year. This is probably due to significant reductions of heavy cannery use of water from the aquifer since the 1970s. Static water levels appear to be recovering some since the mid-1990s. This is a positive trend; however, the wells will need to recover significantly more to reach static water levels of the 1930s to 1940s.

It is very important to observe any trends in static and pumping water levels in the City wells. It would be wise for the City to start recording at least weekly, and preferably daily, static and pumping water level data for each well. This data can then be plotted over a several year period to observe current data trends. This data will be invaluable to the City in predicting the long-term usability of the City wells.

The lowering trend for static water levels in the City's wells, if it continues as past trends have shown in Figure 3-2, will likely require future modifications to the existing pumping equipment so the current yields can continue to be obtained from the wells. The lowering of static water levels may eventually result in the desired well yield being unattainable. If this occurs, the City will need to have alternate sources of water available to meet needs, such as utilizing the existing Walla Walla River surface water right.

The Milton-Freewater area, because of the lowering water levels, could eventually be designated by OWRD as a critical groundwater use area. This type of designation in other areas has resulted in restricted use of some existing wells and no new water rights being allowed for wells in these areas. Since wells currently appear to be the most cost-effective source of drinking water for the City of Milton-Freewater, the City could be faced with a water shortage or increased water treatment costs if the use of surface water were required to meet future demands.

The City should continue monitoring static and pumping water levels throughout the year to observe both seasonal and annual variation in the data. If static water levels are continually declining on an annual basis, it would be wise for the City to begin investigating ways to protect the City's water rights and possibly acquire water rights with old priority dates. Declining groundwater levels may very well become a major issue for the City of Milton-Freewater in the future.

GROUNDWATER SUPPLY RESOURCES

As stated previously, the City appears to have adequate water supply through the year 2028 and possibly beyond. The following comparison of water supply resources is provided for the City's reference should further water sources be sought during the planning period. There are generally four options available to the City for obtaining additional water supply capacity. The options are outlined hereafter, followed by a discussion of the advantages and disadvantages of each option.

- Drill a new well.
- Purchase an existing well with a known capacity.
- Increase the pumping rate of the existing wells.
- Bring the existing Walla Walla River treatment plant back into operation and supplement the well supply sources with treated surface water.

New Well. A new well would be operationally advantageous to the City because an additional supply would be available, allowing existing Well No. 2 to remain as a backup and emergency well. The disadvantage of a new well, as compared to the other two supply options, is the high initial expense. Assuming a new well is desired by the City, the well could either pump directly into the distribution system or to one of the existing reservoirs. Prior to selecting a site for a new well, it is recommended that a geological study be completed to help evaluate possible sites.

Estimating the required depth of a new well to obtain a desired yield on the order of 1,000 gpm is very difficult. The ultimate yield from a well can be determined only after drilling is completed and well testing has been conducted. Assuming the City would drill a new well to a depth of 900 feet, the estimated cost to drill this well is anticipated to be $300,000 to $350,000, which includes land acquisition, drilling, casing, inspecting, and testing the new well. The control building, pump, and miscellaneous appurtenances are anticipated to cost approximately $250,000, bringing the maximum anticipated cost for a new well to about $550,000 to $600,000.

Secure Use of an Existing Well. The well logs presented in Appendix F indicate that at least three wells exist on the east side of the City that would provide a desired yield of approximately 1,000 gpm. Assuming a willing seller is available, securing the use of an existing well would be a desirable option for the City to pursue because the well yield is already known. The existing well logs reviewed in this chapter were all for wells primarily used for irrigation or industrial purposes. In each case, the wells are private, serving an individual owner or company. Water quality testing in accordance with the DWP requirements for municipal wells has likely not been completed for some of these wells. In addition, the DWP municipal well construction requirements may not have been adhered to during construction of these wells. Prior to the City considering acquiring the use of an existing well, considerable information about the well should be obtained, as outlined hereafter.

- Well construction details should be obtained, specifically casing intervals and the depth of the surface seal. Some of this information may not be attainable from existing logs and records. It is recommended that a detailed down-hole inspection of the well be completed to document its condition as best as reasonably possible. At a minimum, the well should be television inspected to check the condition of the well seal, casing, and borehole, cave-ins, etc.

- Water quality parameters should be obtained, specifically testing parameters meeting the requirements of the DWP. Any well considered for municipal use should be thoroughly tested to determine if the water quality is acceptable to the DWP prior to purchase of the well. Other tests not normally required by the DWP that could lead to precipitation of solids in the distribution system, such as water chemistry tests to determine the iron, manganese, and silica content, etc., should also be performed.

- Water rights should be clearly defined, specifically the type of water right (irrigation, domestic, industrial, etc.), whether it is transferrable to the City for municipal use, and whether additional municipal water rights can be obtained for the existing well and aquifer.

- Property ownership of the well site should be understood, specifically if the City could obtain enough land surrounding the well site to construct an adequate well house and fence to protect the site. Typically, a 100-foot radius around the well is desirable.

Estimating the cost associated with securing an existing well is difficult because of the unknown purchasing terms of the seller. It is typically less expensive to secure the use of an existing well when compared to drilling a new well.

Increase Pumping Rate from Existing Wells. The City's existing wells have a known capacity that has been relatively stable since the wells were drilled, although static water levels have generally declined as discussed earlier in this chapter. There may be additional capacity available from the City's wells, depending on each well's specific capacity. Currently, the City has the ability to measure drawdown in their wells (minor modifications may be necessary) during pumping conditions. To adequately evaluate the specific capacity of each well, a detailed pump test would need to be performed while accurately measuring the drawdown of the water level in the casing. Such tests would provide an estimate of the yield of each well for each foot of water level drawdown. Estimates could then be made of how much water each well would be expected to provide and the size of pump required to obtain the desired yield.

To complete a pump test on an existing well, the existing pump can likely be used. However, appropriate measures must be in place to deal with the relatively high discharge rates from the pumps. The means for obtaining accurate water level measurements must also be available. The City would need to test one well at a time so the other wells would be available to meet City demands. Pump tests should be completed during a lower demand time of the year, such as in the early spring or late fall.

Costs associated with a thorough and detailed pump test using existing equipment and assuming the well head is accessible for water level measurements are estimated to be in the range of $10,000 to $15,000 per well. Increasing the yield from existing wells appears to be the least expensive option for additional water supply for the City, if such yield is available. It should be noted that additional water rights may need to be obtained for any increase in use of the existing wells should this option be pursued.

SURFACE WATER SOURCES

The City relied on the Walla Walla River to supply its water in the past and the river still represents a potential source of surface water that could be developed. The following section discusses the issues and options available to the City should surface water treatment be considered in the future.

Regulatory Overview. In December 1991, the Surface Water Treatment Rule (SWTR) of the Safe Drinking Water Act (SDWA) was implemented. Unless the public water system could meet certain stringent water quality and system operational conditions, the SWTR required that surface water sources and groundwater under the influence of surface water be treated to remove bacteria, viruses, turbidity, and inorganic and organic compounds if harmful to human health. The SDWA was amended in August 1996. However, the amendments to the SDWA did not change the regulations set forth in the SWTR.

Walla Walla River Overview. The headwaters of the Walla Walla River are east of Milton-Freewater in the Blue Mountains. The river flows out of the Blue Mountains in both the north and south forks, merges into the main river channel approximately four miles southeast of Milton-Freewater, then flows through the City and Walla Walla Valley, and eventually into the Columbia River near Wallula, Washington. If water from the Walla Walla River is once again utilized as a water supply source for the City of Milton-Freewater, the system would include a river intake structure upstream from the City, a transmission line to a treatment plant located down-gradient from the intake structure, a transmission line from the treatment plant to a new storage reservoir, and a transmission line connecting the new reservoir to the City's primary distribution mains. The storage reservoir would provide equalization storage as well as chlorine contact time for proper disinfection. It is not anticipated that the City's old water treatment plant can be updated to meet current treatment requirements, but the existing site can be used to accommodate a new plant and associated facilities.

Walla Walla River Water Quality. Walla Walla River water was preliminarily evaluated to determine if it has the necessary quality to provide the City with a reliable water source. The Washington Department of Ecology (DOE) maintains a water quality monitoring station on the Walla Walla River and monitors and records important water quality parameters at these stations. The testing station is located near Touchet on the Walla Walla River, which is approximately 18 miles northwest and downstream of Milton-Freewater. See Appendix G for a listing of water quality data obtained at this station. The water quality at Touchet is generally representative of what the City would be withdrawing from the river, but may tend to have slightly higher contaminate levels and temperature readings due to the relatively flat agricultural land that the river passes through between Milton-Freewater and Touchet.

Monthly water quality data from the Touchet station for a period from 1959 through 2000 were obtained from the DOE to determine if turbidity levels in the river are low enough to allow for efficient treatment of the water. The average turbidity for the period from 1959 through 2000 (about 407 months of data) was 90 Nephelometric Turbidity Units (NTU) and the peak monthly turbidity was estimated to be about 9,600 NTU. However, if the three peak turbidity readings from July 1997, December 1994, and March 1996 (2,700, 3,900, and 9,600 NTU, respectively) are not considered, the average turbidity decreases to 51 NTU. Considering that the data taken by the DOE reflects only a point in time each month, the peak daily turbidity levels will likely be significantly higher than 51 NTU. It is also likely that the river would reach levels higher than 100 NTU at least once a year (based on the monthly turbidity data), which may limit the treatment options available to the City or create an unreliable water source if conventional treatment methods are pursued. Furthermore, it appears that color and pH levels have been reported at levels above the recommended secondary maximum contaminant levels set by the SDWA. Consequently, the water quality of the Walla Walla River at Touchet does not appear to be ideal, but should be adequate to allow for efficient treatment with some, but not all, of the water treatment technologies available. These technologies are summarized later in this chapter.

Water Rights. The City owns water rights under Certificate No. 12920 (1890 priority date) to the Walla Walla River that allow for a withdrawal rate of 7.24 cfs (3,245 gpm) for domestic water use. Prior to 1959, the City used a sand filter treatment facility to treat Walla Walla River water prior to supplying the water to City users. The reported treatment capacity of the plant was 1,200 gpm, which represents approximately 37 percent of the City's full water right.

If the City were interested in developing the river as a source of domestic water, its current water right should be adequate to meet future needs as long as some of the City's existing wells remain in operation. However, the flows available in the river vary from year to year and according to the time of year. The amount of water that could be removed from the Walla Walla River, based on existing water rights, is unknown. In-stream water rights have also been established for the river to protect in-stream aquatic life. These in-stream water rights do not necessarily take precedence over the City's water right, but considering the current regulatory environment, may prove to be a limiting factor should the City decide to exercise its water right.

Water Treatment Plant Design Flow. If the City should decide that water treatment to treat a surface water source is a viable option, it appears that the most reasonable method of meeting the water system demands would be to use the water treatment plant to provide the primary supply of water to the City and augment the surface water with the existing wells when needed. This would reduce the demand placed on the wells and would provide additional capacity to the system. Therefore, for purposes of comparison and cost estimating, a design flow rate of 3.3 million gallons per day (MGD), or 2,300 gpm will be used to evaluate the alternative treatment facilities. This design flow represents the average daily demand projected for the year 2028 with a small amount of additional capacity. The design flow rate was not increased to match the full water right flow of 3,245 gpm (4.7 MGD) because it is not anticipated that the City can draw the full flow specified in its water right without significantly impacting river water levels during lower flow periods. The 3.3 MGD should be a conservative flow rate to use, considering the City currently has adequate water supply from its wells available to meet projected year 2028 peak day demands.

Water Treatment Operator Requirements. Prior to discussing specific water treatment technologies, an explanation of the DWP requirements of operators for different treatment processes will be presented. The rules are set forth in Oregon Administrative Rules (OAR) 333-61-220.

OAR 333-61-220 provides a method of determining the required classification of operators based upon an accumulated point system. A specific number of points are assigned to different items within the treatment plant. The points are assigned as follows:

WATER TREATMENT PLANTS ITEMS FOR CLASSIFICATION

Item	Points
Treatment System Size (Either Population or Flow)	
Population Served	1 per 10,000 (max. 25)
Average Daily Flow	1 per 1 MGD (max. 25)
Treatment System Water Source	
Groundwater	3
Surface Water	5
Treatment	
Aeration for CO_2	2
pH Adjustment or Corrosion Control	4
Taste and Odor Control	1 to 8
Color Adjustment	4
Iron and Manganese	1 to 10
Softening	
Ion-Exchange	10
Chemical Precipitation (Lime and Soda Ash)	20

Item	Points
Coagulation Process	
Rapid Mix	5
Flocculation	5
Sedimentation	5
Filtration	
Conventional Rapid Sand	10
Direct Rapid Sand	7
Diatomaceous Earth	7
Slow Sand Filtration	5
Sludge Treatment	1 to 6
Other Treatment	As Appropriate
Fluoridation	5
Chlorination or Equal	5
Bacteriological or Chemical Laboratory	1 to 10

The appropriate points for the treatment system are added and, based upon the cumulative point total, the following classifications are assigned:

CLASSIFICATION OF WATER TREATMENT PLANTS

Class	Points
Class I (WT I)	30 or less
Class II (WT II)	31 to 55
Class III (WT III)	56 to 75
Class IV (WT IV)	76 or greater

These classifications are used by the DWP to determine the certification grade required for plant operators. Should the City decide to pursue a surface water treatment plant, plant operators will have to become appropriately certified.

SURFACE WATER TREATMENT ALTERNATIVES

Introduction. This section discusses in detail several options available to the City for treating surface water from the Walla Walla River. The estimated costs to develop each treatment alternative assume the existing treatment plant facilities are inoperable and cannot be upgraded to meet current standards. However, the land on which the existing treatment plant is located is assumed to be utilized. Therefore, the cost estimates include the treatment plant capital cost, costs to construct an intake structure, influent pumping and piping, booster pumping station, reservoir and associated transmission and distribution piping, and the operation and maintenance costs. The treatment alternatives discussed include slow sand filters, membrane filtration, custom designed mechanical treatment plants, and prefabricated packaged mechanical treatment plants. Each treatment alternative will be evaluated based on a design flow rate of 3.3 MGD.

Slow Sand Filters. The slow sand filter was developed in England in the early 19th Century. The slow sand filter is a filter operated at very low filtration rates without the use of coagulation chemicals in pretreatment. The sand grain size used is small and this, plus the low filtration rate, results in very high removals of coliform, Giardia, cryptosporidium, and other organic materials. The removal takes place almost entirely in a thin layer on top of the sand bed. This layer, referred to as the schmutzdecke or "dirty skin," is composed of dirt and living and dead micro- and macro-organisms from the water. It becomes the dominant filter medium as the filter cycle progresses. When head loss becomes excessive, the filter is cleaned by draining it below the sand surface and physically removing the schmutzdecke along with a small layer of sand. Typical cycle lengths may vary from 1 to 6 months, depending on the source water quality and the filtration rate. Slow sand filters are not effective in treating clay-bearing water because the clay penetrates too deeply into the filter and cannot be removed by the normal surface-scraping operation inherent with maintaining the filter.

Removal mechanisms in slow sand filters are both physical and biological. Living organisms in the filter cause reductions in organic matter and chemical transformations. The effectiveness of the filter improves over the first few cycles as the organisms develop and usually continues to remain high thereafter. An initial improvement period (or ripening period) occurs at the beginning of each cycle after the schmutzdecke has been removed. The initial improvement period observed in operating slow sand filter plants varies from 6 hours to 2 weeks with most improvement periods less than 2 days. A filter-to-waste cycle of about two days is recommended after the filter is scraped.

Slow sand filter systems use a low filtration rate that can range from 25 to 230 gallons per day per square foot; however, most common slow sand filters are designed for rates of about 100 gallons per day per square foot.

The regulation governing effluent water quality from different water treatment processes indicates, for slow sand filtration processes, the turbidity level in the effluent must be less than or equal to 1 NTU in at least 95 percent of the measurements taken each month, and the maximum allowable turbidity level shall at no time exceed 5 NTU. According to the DWP, in certain cases where a municipality can effectively demonstrate that disinfection efficiency is not reduced by high effluent turbidity levels (the main health concern), and the water clarity is such that customers will not complain about "dirty water," the municipality may be granted a waiver from the 1 NTU rule. It will be nearly impossible to keep the Walla Walla River source below 1 NTU with a slow sand filter. A waiver would be required allowing finished water to be 5 NTU or less. The DWP is the agency responsible for granting such a waiver. Obtaining a waiver is a possibility; however, it is beyond the scope of this Master Plan to determine whether or not a waiver can be obtained. If a waiver can be obtained, there would still be a significant period of the year, perhaps months, when river water would not be available for the City if a slow sand filter treatment plant were to be constructed. If a slow sand filter is selected as a treatment option, further analysis of this issue will be needed.

The general components of a slow sand filter would include a raw water inlet/flow distribution structure, a filter gallery consisting of at least two filters to allow for filter cleaning, a disinfection system and controls, a backup electrical generator, water quality and flow monitoring equipment, and a building to house control equipment. The slow sand filter plant would be located at the existing treatment plant site southeast of the

City. This may allow the plant to gravity feed into the lower Middle and North Reservoirs and eliminate the need for pumps and pumping costs. Additional development of the existing site is anticipated to accommodate the desired capacity of the plant.

Some of the advantages and disadvantages of the slow sand filter plant alternative are as follows:

Advantages

- Easy to operate; minimal operator attention and training required to operate the plant (requires only a Class I water treatment plant operator).
- High coliform, Giardia, cryptosporidium, and solids removal potential without complex chemical feeders and controls.
- No process pumping and controls are necessary.
- No chemical sludges are produced; only required to dispose of dirty sand or hydraulically wash the sand for reuse.
- Low operation and maintenance (O&M) costs.

Disadvantages

- High quality raw water source required; typically raw water turbidity levels of no more than 5 NTU are required to meet water quality standards.
- Highly sensitive to fluctuations in water quality.
- Turbidity and color removal efficiencies are usually low.
- Relatively high capital cost.

For preliminary sizing purposes and cost comparison, a filtration rate of 100 gallons per day per square foot of filter surface area will be utilized. Based upon the preliminary estimated flow rate of 3.3 MGD, a minimum of 33,000 square feet of filter area would be required. Conceptually, four filter basins of 8,250 square feet each would be the minimum recommended basin size.

For a planning level cost estimate, a reasonable unit cost for a slow sand filtration plant is $200 per square foot of filter area, or $6.62 million for a 33,000 square foot plant. Additionally, the O&M costs including labor, equipment replacements, materials, and energy costs are estimated to range from $300 to $375 per million gallons of water treated, or $362,000 to $452,000 per year, depending on the water quality of the source.

Membrane Filtration. An emerging water treatment technology that may have application for the City of Milton-Freewater is membrane filtration. Membrane filtration is a physical straining process used for removing turbidity and micro-organisms from the source water. Water is pushed through a porous fiber material. The membranes have a nominal opening size of 0.01 to 0.2 microns, 10 to 300 times smaller than the size of the target organisms such as Giardia or cryptosporidium. The removed particles and organisms remain on the raw water side of the membrane and are flushed away using compressed air and backwash water.

Membrane filtration relies solely on physical processes. To provide a comparison, slow sand filtration is a biological/physical process and rapid rate filtration (discussed in subsequent sections) is a chemical/physical process. Similar to slow sand filtration, membrane filtration requires no coagulation chemicals. It requires only limited operator process control and has been found very reliable in producing safe drinking water. In addition, like slow sand filtration, its use is limited to source waters with relatively low levels of turbidity. As with slow sand filtration, membrane filtration could be limited by high turbidity levels in the Walla Walla River and may not be available for use for extended periods of time.

Because water must be pushed through the membrane, membrane filtration has certain pressure requirements associated with it. The required operating head is 30 to 50 psi. Typically, raw water pumps are required, but it is likely that a membrane filtration plant could be constructed in such a way as to take advantage of gravity pressure from the Walla Walla River source. This could be achieved by moving the intake structure up higher on the river. This would eliminate the energy cost for providing the driving pressure with pumps. A detailed evaluation of the plant site and the surrounding area would need to be undertaken to confirm this.

Membrane filtration is effective on many different surface water supplies. However, like slow sand filtration, pilot tests should be conducted to confirm its applicability on a specific waterway prior to constructing a membrane filtration treatment facility. Pilot testing also allows the operators to gain first-hand experience with the equipment to aid in the decision-making process, which can be a critical component when selecting a supply system. In general, membrane filtration is better able to handle adverse water quality conditions than slow sand filtration, but is not as flexible as conventional or direct filtration.

Pilot testing of membrane filtration ideally includes parallel testing of equipment from two or more equipment suppliers. The suppliers will often provide their equipment and some startup services at a relatively low cost, but the overall program with engineering, supply connections, and lab costs might total from $50,000 to $70,000. If the City decided to further investigate membrane filtration, it would be advisable to discuss the City of Pendleton's pilot program with their staff. Pendleton completed such a program and has a membrane filtration plant that has been operational since 2004.

The general components of a membrane filtration water treatment plant would consist of a raw water inlet/flow distribution structure, raw water pumps (which may not be required if gravity pressure can be provided), a bank(s) of membrane cartridges, process and yard piping, clear well, plant controls and electrical equipment, disinfection system, plant building(s), a backup electrical generator, water quality and flow monitoring equipment, effluent disposal system, and miscellaneous mechanical equipment.

Some of the advantages and disadvantages of the membrane filtration treatment plant alternative are as follows:

Advantages

- Easy to operate; minimal operator attention and training required to operate the plant.
- Reliability of treatment.
- High coliform, Giardia, cryptosporidium, and solids removal without complex chemical feeders and controls (no chemical addition needed).
- No chemical sludges are produced; only required to dispose of natural materials physically removed from the source water.
- Consistent high quality water produced.
- Small footprint, which is easily expandable in the future since the equipment is modular in design.

Disadvantages

- Relatively high capital and O&M costs.
- Membranes have a relatively short life span (4 to 10 years). Membrane replacement is one of the major O&M costs.
- A high quality raw water source is required to ensure efficient operation of the plant.

Membrane filtration costs have dropped significantly. Until the mid-1990s, it was generally considered too expensive for systems larger than about 1 MGD. This has changed and many systems with capacities from 5 to 30 MGD are being installed in the United States. It is expected that this trend will continue.

As a matter of reference, in Oregon, Warrenton and Pendleton have installed membrane filtration plants with capacities of 6 MGD. The cost of the membrane package equipment for Warrenton's 6 MGD plant was approximately $2.3 million in 2004 construction costs. When other project components are included (chlorination facilities, plant building, clear well, site work, piping, and other mechanical aspects), the overall plant construction cost was about $6.5 to $7.5 million in 2004. This represents a cost range of $1.08 to $1.25 per gallon of installed capacity. The actual cost of a plant for Milton-Freewater will vary from this range depending on site-specific factors. It would likely be somewhat higher because the City would be constructing a smaller plant and, consequently, the cost per gallon of capacity would be higher (i.e., the smaller the plant, the higher the cost per gallon of installed capacity). The estimated costs also need to be adjusted about 25 percent for inflation. For this master planning effort, a reasonable cost estimate is $1.90 per gallon of installed capacity, or $6.27 million for a 3.3 MGD plant. O&M costs are anticipated to range from $420 to $550 per million gallons of water treated, or $506,000 to $662,000 per year, based on a plant design flow of 3.3 MGD.

Custom Designed Direct Filtration Treatment Plant. The basic treatment process of a direct filtration water treatment system consists of coagulation, flocculation, and filtration. Coagulation is a physical/chemical process that occurs by use of chemicals or polymers (coagulant) whereby a reaction between the particulates in the water and the coagulant neutralizes the electrical charges on the particles and causes small particles to agglomerate (coagulate) into larger particles. Flocculation is agitation of the chemically treated water to induce coagulation by bringing the particles in contact with each other. Flocculation is the principal mechanism in removing turbidity from water. The larger particles created through the coagulation/flocculation process are more easily removed by the filtration process.

Typical flocculators consist of a mechanically driven shaft that supports reels. Paddles are attached to the reel. The flocculators would be constructed in a concrete basin containing paddles and baffles. The flocculation tank would be located upstream of the filters. The filters would operate by gravity and would consist of a concrete basin containing an underdrain system, an air scour system, a media backwash system, a backwash water drain system and single, dual, or mixed media. Common materials used in filters are sand, crushed anthracite coal, and garnet. Single-media filters use sand alone. Dual-media filters typically use a combination of coal and sand. Mixed-media filters use a combination of all three materials. The choice of whether to use single, dual, or mixed media depends on the raw water quality and is determined through pilot testing.

Direct filtration processes typically use rapid filtration. Rapid filtration consists of passage of coagulated water through a granular bed at rates from 2 to 10 gpm/ft^2 with a typical filtration rate of 5 gpm/ft^2. Flow is usually downward through the bed. During operation, solids are removed from the water and accumulate within the voids and on the top surface of the filter medium. This clogging results in a gradual increase in head loss across the filter if the flow rate is to be sustained. Once a maximum head loss is obtained, the filter is backwashed to clean the medium and ready the filter for continued operation. Backwash rates are usually about 15 gpm/ft^2. Typical filter cycles range from about 12 to 96 hours, depending on the raw water quality.

In order to accomplish the treatment processes described above, the plant would require chemical feed equipment (coagulation, pH control, disinfection), at least two flocculation basins, at least two filters, a standby electrical generator, a plant control system, and process piping and valves. In addition to providing these items, the plant would require an effluent clear well, backwash water recovery basin, backwash pumps, and air blowers.

Some of the advantages and disadvantages of the custom designed direct filtration water treatment plant alternative are as follows:

Advantages

- Proven reliable process.
- High process flexibility.
- Capable of treating highly variable water quality conditions and continuing to produce a high quality effluent.

Disadvantages

- Chemical sludges are produced that require sludge handling and disposal.
- Complex system to operate; requires high operator attention and knowledge of process control and water treatment (would require a Class II or Class III operator depending on the ultimate process scheme).
- High capital cost.
- High O&M costs.

The construction cost per unit of water treatment capacity varies widely with the size of the plant. Usually, the construction cost per unit of water treatment capacity becomes less with larger plants. However, based on other direct filtration plants of sizes similar to what Milton-Freewater would be installing, the construction cost is about $1.80 per gallon of water. Therefore, considering the City would require a 3.3 MGD plant, the plant construction cost alone would be approximately $5.94 million. Additionally, the O&M costs including labor, power, equipment maintenance, chemicals, and sludge handling and disposal, based on other operating plants in the region, are about $275 to $425 per million gallons of water treated, depending mainly on raw water quality. This equates to $330,000 to $512,000 per year based on an average annual flow through the plant of 3.3 MGD.

Packaged Water Treatment Systems. The water treatment industry has many different established manufacturers of packaged water treatment systems that offer a wide variety of different treatment options and process configurations. However, virtually all of the systems operate on the same principles of coagulation, flocculation, and filtration with some of the systems including sedimentation as a process step prior to filtration. Coagulation and filtration can remove a variety of substances including particulate matter that causes turbidity, microorganisms, color, precursors of disinfection byproducts (organic acids), and some inorganic contaminants. The types of systems generally include:

1. Adsorption clarification with rapid dual or mixed-media filtration.

2. Modified conventional (coagulation, flocculation, and tube settling) with rapid dual or mixed-media filtration.

3. Solids contact clarification with dual or mixed-media filtration.

4. Diatomaceous earth (precoat) vacuum filtration.

5. Pressure filtration.

A detailed analysis of the existing packaged water treatment systems should be completed should the City decide to pursue surface water treatment. Costs for these systems can be considered to be in the general range of costs developed for the three previous filtration systems ($6 to $8 million). O&M costs are also anticipated to be in the ranges previously described, approximately $360,000 to $660,000 per year or more.

Water Treatment Residuals and Sludges. A discussion of water treatment alternatives would not be complete without addressing the issue of residuals and sludges generated as a byproduct of the water treatment processes. Without exception, every treatment process type will necessarily produce sludges that will have to be dewatered in some fashion and subsequently disposed of properly.

Sludge handling and disposal is a substantial portion of the annual cost of operating a water treatment facility. The sludges typically contain the filtered particulates and some contain residual chemicals used as coagulant aids. The sludges must first be dewatered (probably by pumping thickened sludges from a backwash water basin to a sludge drying bed) and then hauled to either a land application site or a sanitary landfill. The amount of sludge generated is directly related to the source water quality: the higher the turbidity levels, the more sludge is generated.

The DEQ has published guidelines for land application of industrial solid wastes. The guidelines explain the criteria for site selection, limitations, land application approval processes, solids and soils analysis protocol, monitoring, recordkeeping and reporting.

Disposing of water treatment sludges in sanitary landfills is a common practice. Typically, constituents in ordinary water treatment sludges do not exclude these solids from being disposed of in a municipal sanitary landfill. The disadvantage of this practice is that the potential benefit of recycling the wastes and minimizing waste disposal to landfills is not realized.

Summary of Surface Water Treatment. The previous section discussed several water treatment process technologies for treatment of the Walla Walla River surface water source available to the City of Milton-Freewater. The capital and O&M costs of each treatment technology were also presented.

The water quality of the Walla Walla River appears to be adequate to allow all of the technologies presented under each source alternative to effectively treat the water to high quality potable standards. However, high turbidity levels in the river may limit the use of certain technologies during these high turbidity events. Further monitoring of the water quality in the river near Milton-Freewater would allow more definitive timeframes for these high turbidity periods to be defined. Should the City choose to pursue surface water treatment as a source option, a thorough evaluation of the available technologies should be done at that time. Some of the technologies have potential advantages over others and these technologies should be targeted by the City for further evaluation. Prior to any particular treatment process design, extensive pilot testing should be completed on the viable options. Pilot testing will effectively demonstrate whether or not a particular process will work and will aid in process design decisions.

Many variables must be considered, which are beyond the scope of this Master Plan, before the best treatment method can be selected. For source alternative comparison purposes, it was assumed that the 2008 capital cost to construct a water treatment facility is reflected by the estimated average capital cost of the three primary treatment alternatives (slow sand filters, membrane filtration, and custom designed direct filtration) previously discussed. Based upon these assumptions, the estimated 2008 capital cost to construct a water treatment facility for the City of Milton-Freewater, including all additional improvements necessary for a complete and operating system, is estimated to be approximately $6 million. The estimated 2008 annual operation and maintenance costs are between $360,000 and $660,000, depending on source water quality.

COMPARISON OF WATER SUPPLY OPTIONS

Four water supply options for the City of Milton-Freewater to consider for meeting their current and future water supply needs have been discussed in this chapter. For comparison purposes, the following table briefly outlines advantages and disadvantages of each option.

COMPARISON OF WATER SUPPLY OPTIONS

Option	Advantages	Disadvantages
New Well	Additional supply developed. New well can be constructed as City desires. Water supply system is more reliable, allowing existing wells to be cycled in and out of service.	A new well is the most costly of the three well-related source alternatives. The capacity of the well cannot be confirmed until drilling is completed.
Secure an Existing Well	Same advantages as a new well. This option is likely less expensive when compared to a new well, depending on the seller's terms.	Unknown information about the well, such as construction details, water quality, etc. This information needs to be obtained prior to purchasing an existing well. The informational investigation requires an expenditure of funds for a well that may not be purchased, depending on the outcome of the investigation.
Obtain Additional Yield from Existing City Wells	Least expensive option. No new well is needed, assuming more yield is attainable.	The desired yield may not be attainable. Testing would be required to confirm desired yield is available. Additional draw from wells may increase air entrainment and/or declining water level problems.
Develop Surface Water Treatment Plant on the Walla Walla River	Additional diversified water supply is developed. Allows existing City wells to be operated less and cycled in and out of service. Allows a backup to potential air entrainment problems and declining water levels seen in many of the City's wells.	Capital cost is high. A pilot study would need to be undertaken to decide which treatment option would best serve the City. Includes potential problems with drawing water from the river during high demand periods when turbidity levels are high.

Based on the peak demand data outlined earlier in this chapter, the City of Milton-Freewater does not appear to need a new source of water during the planning period of this study. However, it is important to determine, as accurately as possible, when a new source will be needed so adequate time can be allocated to properly complete the permit, design, and construction of the source. It is possible that a new well, from the initial permit process through final construction, can take two to three years or more before the well is ready for municipal use. The anticipated permitting, preliminary studies, design, and final construction of a surface water source could take from three to five years or more to complete. With these timeframes in mind, it is recommended the City pay close attention to water demands to ensure that the water demand projections of this Plan are not being exceeded to help anticipate when a new water source is needed.

SUMMARY AND RECOMMENDATIONS

The City's current available total water supply capacity of 7,520 gpm (assuming the air entrainment problem in Well No. 1 is dealt with) exceeds the year 2028 design criteria of this Water System Master Plan. The City's current water supply sources are also free of contamination (outside of the inconvenience of air entrainment). If population growth and water use rates continue as projected, and the wells continue to meet water quality requirements, water supply improvements do not appear to be needed. In addition, regularly checking flowmeters for accuracy and regularly completing a water audit are important procedures that conserve water and help prolong well pump life.

It is recommended that the City construct a pipeline connecting Well No. 1 to the Middle Reservoir in order to let the entrained air from this well dissipate inside the reservoir. Based on the City's belief that the air entrainment seems to be moving in a northwesterly direction, it is not recommended that such transmission lines be constructed for City Wells No. 8 and 9 unless entrained air develops in these sources at a later date. The costs associated with the transmission line for Well No. 1 are presented in Chapter 6.

It is strongly recommended that the City pay close attention to static and pumping water levels over time for their supply wells. The static water level trends indicated in Figure 3-2 for the City wells show that static water levels in the Milton-Freewater area have declined in the past but do appear to have stabilized and possibly increased. The 7,520 gpm total capacity currently available to the City will most likely be reduced if the wells lose efficiency over time or if the static water levels continue to decline in the future. The City could be faced with a major water supply shortage before the year 2028 if declining static water level trends worsen.

WELL SUMMARY

	Date Drilled	Depth in feet (intial/extended)	Casing / Bore	Grout Seal into Confining Layer	Pump Motor Type	Motor HP	Pump Type	Intake Depth	Flow Capacity (estimated gpm)	Floor	Emergency Power	Treatment	Meter	Comments
Well No. 1	1938	636/656	12" to 100', 12" open to depth	Yes, 40' into rock	US Electric	200	Vertiline	430	830	concrete	No	Hypochlorite	yes	
Well No. 2	1944	902	16" to 99', 16" open to depth	Yes, 36' into rock	US Electric	250	Vertiline	590	750	concrete	yes (350 KVA)	Hypochlorite	yes	
Well No. 3	1946	550/596	20" to 43', 16" to 100', 16" open to depth	Yes, 21' into rock	US Electric	200	Vertiline	452	1150	concrete	No	Hypochlorite	yes	
Well No. 5	1936	502/512	18" to 40', 12" to 172', 12" open to depth	Yes, 12' into rock	GE	150	Peerless Turbine	280	1100	concrete	No	Hypochlorite	yes	upgrade in process
Well No. 6	1950	952	20" to 45', 16" to 61', 16" open to 210', 12" open to depth	No, casing ends at rock	US Electric	250	Layne Bowler	424	1400	concrete	No	Hypochlorite	yes	
Well No. 8	1965	888/1051	20" to 480', 12" open to 829', 10" open to depth	Yes, 449' into rock	GE	400	Layne Bowler	497	1490	concrete	No	Hypochlorite	yes	
Well No. 9	1951	918	18" to 193', 16" to 296', 16"concrete to 321', 16" rock to 695', 12" cement to 724', 12" open to depth		US Electric	125	A.D. Cook	360	800	concrete	No	Hypochlorite	yes	

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CITY OF
MILTON-FREEWATER, OREGON
WATER SYSTEM MASTER PLAN

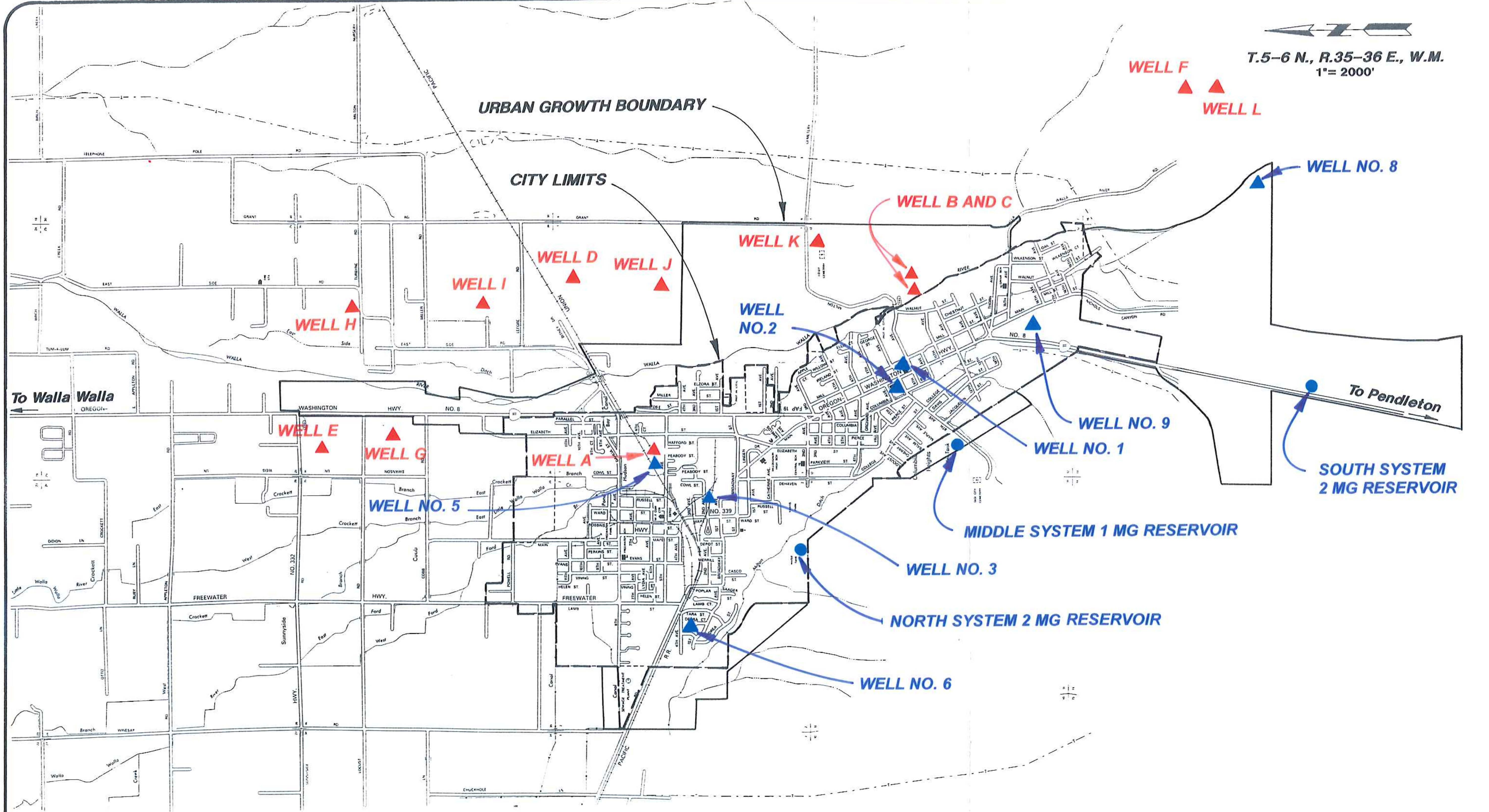
WELL SUMMARY

TABLE 3-1

MILTON-FREEWATER AREA WELL DATA

Well Identification[1]	Well Owner	Date Drilled	Depth Drilled (feet)	Static Water Level[2] (feet)	Tested Well Yield[2] (gpm)	Water Level While Pumping (feet)
A	City of Milton-Freewater (formerly Key Equipment Co).	2/16/1945	528	49	1,350	81
B	Rogers Canning Co.	4/20/1944	702	117	1,200	---[3]
C	Rogers Canning Co.	6/14/1951	560	125	1,000	---[3]
D	J. Frank Schmidt & Son Co.	6/27/1968	660	302	925	277
E	Fred Kaup	5/30/1985	102	36	500	---[3]
F	Clyde Harris	1/25/1968	195	47	472	49
G	Sam Lefore	1/29/1981	243	100	450	126
H	Oland Hubbs	1914	258	12	450	72
I	Willa M. Arnoldt	1/1/1920	90	15	400	30
J	Milton Nursery Co.	1925	30	10	400	20
K	Milton-Freewater Cemetery District	2/11/1996	706	356	150	---[3]
L	Dick Frye	2/20/1961	706	10	---[3]	---[3]
City Well No. 1	City of Milton-Freewater	3/1/1938	656	202	1,484	384
City Well No. 2	City of Milton-Freewater	5/6/1944	902	105	1,135	178
City Well No. 3	City of Milton-Freewater	6/1/1946	596	50	450	133
City Well No. 5	City of Milton-Freewater	1936	502	120	750	167
City Well No. 6	City of Milton-Freewater	12/22/1950	952	127	1,500	272
City Well No. 8	City of Milton-Freewater	4/14/1965	1,051	269	1,529	466
City Well No. 9	City of Milton-Freewater	6/22/1951	918	205	1,501	295

Notes:
1 See Figure 3-1 for approximate well locations.
2 Unless otherwise noted, static and pumping water levels, tested yield, etc., were generally obtained just after drilling. Well yields were tested by air methods, bailers, or pumps and should be considered approximate. Actual yield may vary substantially under continuous prolonged pumping conditions.
3 Data unavailable.



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CITY OF
MILTON-FREEWATER, OREGON
WATER SYSTEM MASTER PLAN
AREA WELL LOCATIONS

FIGURE
3–1

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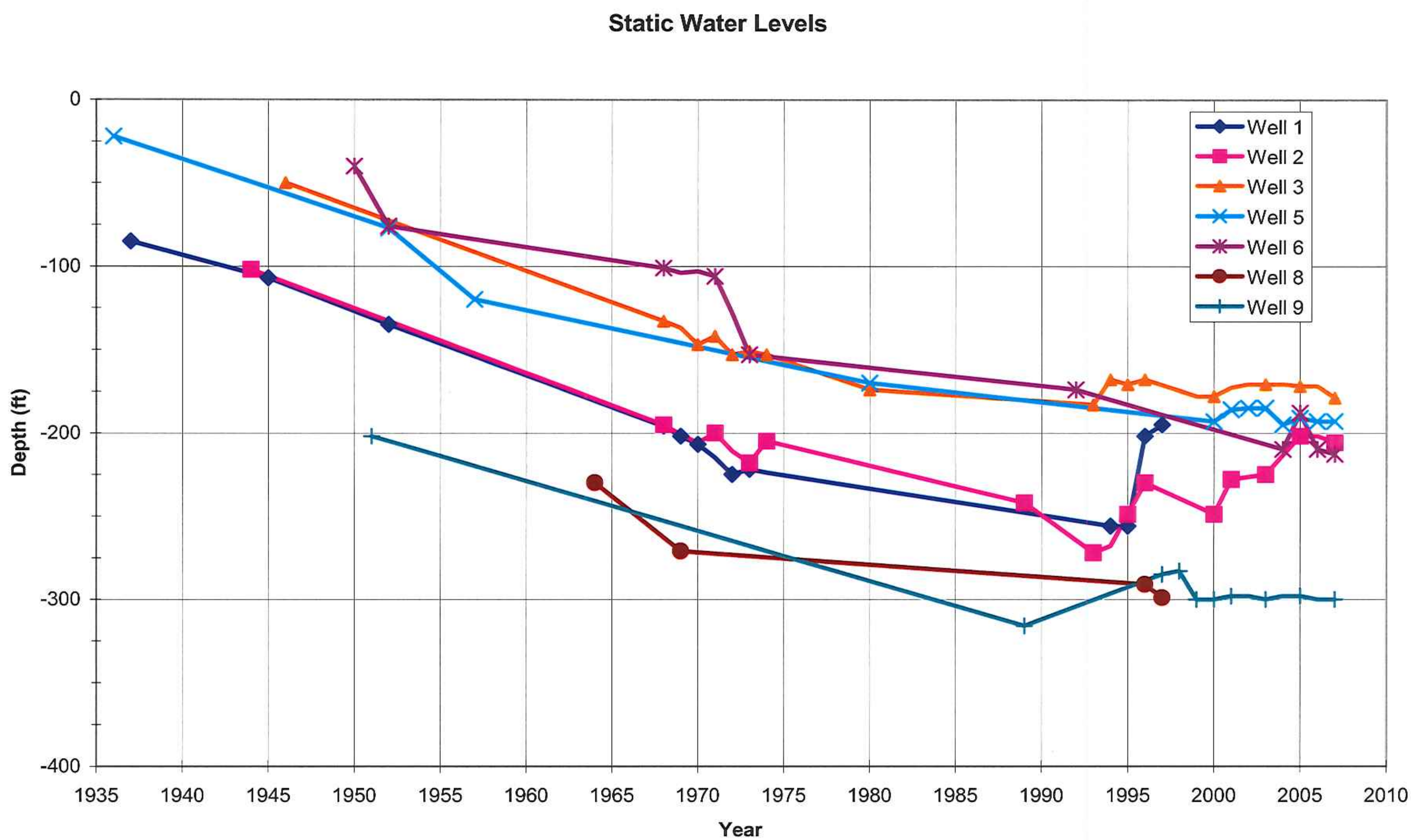

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CITY OF
MILTON-FREEWATER, OREGON
WATER SYSTEM MASTER PLAN

STATIC WATER LEVELS

FIGURE
3-2

CHAPTER 4

WATER STORAGE

INTRODUCTION

This chapter presents information on the City of Milton-Freewater's water storage facilities. The purpose for storage in municipal water systems is discussed and the types of storage facilities available are outlined. The condition and needs of the City's existing storage facilities are detailed and recommended storage requirements are presented. Recommendations for improving the City of Milton-Freewater's storage facilities are outlined. Cost estimates for the recommended improvements are presented in Chapter 6, Recommended System Improvements.

GENERAL

Water storage facilities are constructed to achieve several purposes. First, storage reservoirs are often used to provide control for well operation. When a reservoir drops a few feet or more from the full level, the water level can be used as a control for well pump activation. The amount of storage required for this type of control is called "operating storage." Second, stored water must be available to supply water during periods in which the demand for water exceeds the available water supply. This reserve is called "equalization storage." Third, reserve storage is usually provided to supply unusually large demands such as fire flows. This is referred to as "fire reserve." Finally, storage is often provided for emergencies that may arise and interfere with production from water supply sources. Such emergencies could be created by power outages, mechanical equipment failure, or sudden water contamination. The amount of storage to be provided for an emergency depends on the likelihood and the impact of such an occurrence. The amount of emergency storage provided usually becomes a balance between what is needed and what can be afforded. This storage allowance is referred to as "emergency reserve."

Storage facilities can be located at approximately the same elevation as the entrance to the water distribution system. Storage facilities of this type require continuous operation of a booster pump system to maintain distribution system pressure. Storage facilities can also be elevated, in which case the water is stored at an elevation considerably above the distribution system in order to generate adequate system pressures. For example, a water elevation of 120 feet above a distribution system would be required to generate a distribution system static pressure of approximately 50 pounds per square inch (psi). Reservoirs may be elevated by locating them on natural ground high enough above the service area (this is the case for the City's three reservoirs) or by construction on top of a steel support frame.

Storage reservoirs are generally constructed of either steel or reinforced or prestressed concrete. The choice is usually based on an economic analysis made for the particular installation. Reservoirs may be constructed either above ground or buried, with the choice made on cost, location, and community acceptance. The remainder of this chapter reviews the City's existing storage facilities, presents a discussion of future storage needs, and provides alternatives for satisfying those needs.

EXISTING FACILITIES

The City's existing storage facilities consist of three reservoirs that represent a total of 5 million gallons of storage. Because of the locations of the existing reservoirs, the City identifies them as the North Reservoir, the Middle Reservoir, and the South Reservoir. The North Reservoir is a 2-million-gallon (MG) steel reservoir located at an elevation of approximately 1,140 feet above mean sea level (MSL). This reservoir was reportedly constructed in 1961, is about 43 feet tall, and is 93 feet in diameter. The Middle Reservoir is a 1 MG steel reservoir located at an elevation of approximately 1,215 feet above MSL. This reservoir was constructed in 1956 to a height of 31.5 feet with a diameter of 74 feet. The South Reservoir is a 2 MG steel reservoir located at an elevation of approximately 1,445 feet above MSL. This reservoir was constructed in 1999, is 23.5 feet tall, and is 120 feet in diameter.

Both the North and Middle Reservoirs were television inspected and cleaned on January 6 and 7, 1997, respectively. Video logs were completed for the interior inspections without draining the water from the reservoirs. The reservoir inspections were completed by LiquiVision, Inc. LiquiVision, Inc., did not make recommendations in their reports concerning maintenance or improvements for either reservoir. The City indicated that, to the best of their knowledge, neither reservoir had been cleaned since they were constructed. The City also indicated that a regular inspection and cleaning program would be implemented in the future for the City's reservoirs.

The North 2 MG steel reservoir was reportedly in relatively good condition at the time of the LiquiVision, Inc., survey. The survey identified an average sediment depth of 1/8 inch in the reservoir, which was approximately 3 cubic yards of sediment over the entire reservoir floor. LiquiVision, Inc., estimated that the primary components of the sediment were manganese and iron. The sediment was removed from the reservoir at the time of inspection. The reservoir inspection summarized the condition of the interior paint system as being in overall good condition with a few specific rust spots indicated at the time of the inspection.

LiquiVision, Inc., also inspected the Middle 1 MG steel reservoir. This reservoir was also reportedly in relatively good condition at the time of the survey. The survey identified an average sediment depth of one inch in the reservoir, which equated to approximately 13 cubic yards of sediment over the entire reservoir floor. The divers also found an anode from the cathodic protection system on the floor near the center of the reservoir, which apparently fell from the ceiling. The sediment and anode were removed from the reservoir. The reservoir inspection summarized the condition of the interior coal tar coating system as being in overall good condition beneath the water surface although the coating above the water line was peeling and separating from the wall. A copy of the reservoir inspection video log is included in Appendix H.

EXISTING PRESSURE ZONES

The City of Milton-Freewater has three pressure zones in their existing distribution system. Pressure zones are discussed in greater detail in Chapter 5, Distribution System, and are also discussed briefly hereafter as they relate to the existing storage reservoirs. Fire flow capabilities in each pressure zone, as well as pressure reducing valves, booster pumps, and other distribution system issues, are also discussed in Chapter 5.

Elevations in the current City Limits of Milton-Freewater range from approximately 950 feet above MSL in the northwest area of the City to as high as 1,270 feet above MSL to the southeast. The service elevation of the City's existing water system ranges from approximately 955 to 1,150 feet above MSL, a difference of 195 feet, which represents a static water pressure range of approximately 84 psi. In systems with substantial elevation changes such as Milton-Freewater's, the system must be divided into pressure zones that are designed to keep water pressure within reasonable operating ranges. Ideally, these pressure zones would be designed to provide minimum static water pressures of 40 psi at the higher elevation areas in the zone and a maximum static water pressure of 80 psi at the lower elevation areas in the zone. Because of the large elevation difference within Milton-Freewater, the City has had to expand these pressure zones to provide minimum static water pressures at approximately 35 psi and maximum static water pressures near 100 psi. Figure 4-1 shows the existing pressure zone boundaries within the City.

As shown on Figure 4-1, the Middle and South Pressure Zones have a strip of area between the two zones (1,165 to 1,235 in elevation) that does not fit within the 35 psi to 100 psi operating pressure criteria. Most of this area is located on rock bluffs in the southwest area of the City and is not likely to be developed. However, areas in the southeast portions of the Urban Growth Boundary that develop within this band in the future will need to be supplied by the South Reservoir and will likely need to have individual pressure reducing valves (PRVs) installed on the water service lines. Alternatively, a larger area could be served by a main line PRV station.

The City of Milton-Freewater's three pressure zones have developed over the years to meet the City's expanding water service needs. The distribution system and water system components serving each existing pressure zone are depicted on the Water System Map contained in a pocket at the end of this Plan.

STORAGE REQUIREMENTS

Water storage is usually provided for several purposes as outlined at the beginning of this chapter. Various methods are used to calculate the volumes of each type of storage component required. Most involve a rational approach to estimating the volume of each storage component consisting of operational, equalization, emergency, and fire reserve. The decision can then be made as to which component controls, and what storage volumes, will actually be necessary. For example, the decision may be made to provide storage for operational, equalization, and fire reserve only, assuming any emergency storage would be available from the fire reserve. If this option were selected, there may not be adequate fire storage available if a sustained power outage occurs or if a well pump is out of service for some reason. An advantage associated with Milton-Freewater's water system is that multiple supply sources and storage reserves can be relied upon during emergency conditions, providing considerable system redundancy.

Normally, the four components of storage (operational, equalization, emergency, and fire reserve) are determined for an entire city, if the city has one pressure zone, or if the city is served from only one large reservoir through adequately sized pressure reducing valves. The City of Milton-Freewater currently has three pressure zones, each with its own storage component needs. The analysis of each of the four storage components is presented hereafter for each pressure zone.

Fire Reserve Storage. Reserve storage for fire suppression is usually determined from either the ISO Commercial Risk Services, Inc. (ISO) recommended fire flow, or the fire flow recommended by the City's fire chief. Based on the maximum ISO recommended fire flow, a 3,500 gallon per minute (gpm) fire flow with a two-hour duration has been set as the maximum design fire flow for Milton-Freewater. All three of the City's pressure zones provide water service to commercial areas. Therefore, the maximum recommended fire flow for commercial areas of 3,500 gpm has been used to determine fire reserve storage requirements for all three pressure zones. A summary of the required fire flows and corresponding fire reserve storage volume for each of the three pressure zones is as follows:

FIRE RESERVE STORAGE REQUIREMENTS

Zone	ISO-Required Fire Flow (gpm)	Duration (hours)	Total Required Storage Volume (gallons)
North	3,500	2	420,000
Middle	3,500	2	420,000
South	3,500	2	420,000
Total required fire reserve storage volume			1,260,000

Emergency Storage. Emergency storage is usually provided for a minimum of one to a maximum of three days' supply in the event of a power outage, mechanical problem, or other problems that would interrupt the supply of water. In most cases this would be the minimum amount of time to repair or replace a well pump or other equipment. Because Milton-Freewater has several well sources and has standby power available for one well, it was assumed one day of emergency storage at average use rates would be adequate for emergency reserves. To provide the minimum one-day emergency reserve at the present estimated average use rates and population, a total emergency storage volume of approximately 1,965,000 gallons would be required. This one-day emergency storage volume would be approximately 2,925,000 gallons at the projected design population of 9,750 in the year 2028. In order to estimate emergency storage volumes required for each of the three proposed zones, an estimate of the anticipated population of each zone was completed. It was assumed the North and Middle Pressure Zones would contain the majority of the existing and future residents in the City. A summary of the required emergency storage in each zone is as follows:

EMERGENCY RESERVE STORAGE REQUIREMENTS

Zone	Average Design Flow (gpcd)	Assumed Population (year 2028)	Total Required One-Day Emergency Storage Volume (gallons)
North	300	4,713	1,413,900
Middle	300	4,713	1,413,900
South	300	324	97,200
	TOTAL	9,750	2,925,000

Because of redundancy in the City's water supply system and the ability of higher elevation zones to serve lower elevation zones, the emergency storage volumes allocated to each zone, as presented above, may appear excessive. However, during an emergency event, such as an extended duration power outage, all of the City's water supply sources, except Well No. 2, would be unavailable. The South Pressure Zone could not be supplied with more water, and the entire North Pressure Zone would be supplied by a single PRV connection to the Middle Pressure Zone (under normal operating conditions). Therefore, the emergency reserve allocations presented above for each zone are felt to be appropriate.

Operating Storage. Operating storage is provided to facilitate operation of the City's wells and booster pumps. All of the City's booster pump stations are controlled by reservoir water level sensing systems installed in the reservoirs they serve.

Currently, the City's wells are activated when various water depths are reached in the reservoirs and deactivate when the storage reservoir reaches its full capacity or a designated depth. Further details on these activation and deactivation levels are described in Chapter 3, Water Supply and Treatment. The City has relatively low set points for well activation to provide improved "turnover," or circulation in the storage reservoirs. However, it is operationally preferable to have as much water stored in the reservoirs as possible at all times to meet emergency needs, such as fire flow demands. For example, if the City were to have a primary supply well failure when reservoir water depths happened to be at low levels, there would be a minimum amount of storage available and the other supply wells to the reservoir may not be able to meet the demand at the time. A balance needs to be determined both to provide the desired water circulation and to keep a reasonable amount of water in storage reserve. It is recommended the City raise the primary well activation set points to within 4 feet below the reservoirs' full level and adjust the secondary well activation set points accordingly. By raising the set points to the recommended levels, 10 to 17 percent of the reservoirs' volume will be circulated during each cycle, and the water stored in reserve will increase to better accommodate emergency conditions.

For the purposes of determining the recommended operating storage reserve for each of the reservoirs, it was assumed the change in water depth between activation and deactivation of the wells would be 4 feet. The resulting operation storage in each zone is as follows:

OPERATING RESERVE STORAGE REQUIREMENTS

Source Reservoir and Associated Service Zone	Flow Control Limits	Total Required Operational Storage Volume (gallons)
North	4 feet below full storage level	190,400
Middle	4 feet below full storage level	128,700
South	4 feet below full storage level	338,400
Total required operational reserve storage volume		657,500

Equalization Storage. Equalization storage must be provided to balance out the difference between peak hour demand and water supply capacity during a peak day demand period. An empirical method for estimating the volume of equalizing storage uses the difference between the peak hour flow and the peak water supply flow for a specified number of peak hours per day. To determine equalization reserve storage for each pressure zone, the estimated population for each zone used earlier to calculate emergency reserve was also used to estimate the peak daily flow in each zone. A summary of the required equalization reserve storage in the year 2028 for each zone is as follows:

EQUALIZATION RESERVE STORAGE REQUIREMENTS

Pressure Zone	Peak Daily Flow (gpm)[1]	Peak Instantaneous Flow (gpm)	Available Flow (gpm)	Total Required Equalization Storage Volume (gallons) for 2.5 Hours
North	2,539	6,348 [2]	3,650 [3]	404,700
Middle	2,539	6,348 [2]	3,870 [4]	371,700
South	0	0	1,330 [5]	0
Total required equalization reserve storage volume				776,400

1 Assumes 4,875 people in each of the North and Middle Pressure Zones used 750 gallons per capita per day (gpcd) of water.
2 Peak instantaneous flow is 2.5 times peak daily flow.
3 Assumes available supply is through City Wells No. 3, 5, and 6.
4 Assumes available supply is through City Wells No. 1, 2, 8, and 9.
5 Assumes available supply is a booster pump system of two pumps within the Well No. 9 pump house capable of supplying 450 gpm and 880 gpm, for a total supply of 1,330 gpm.

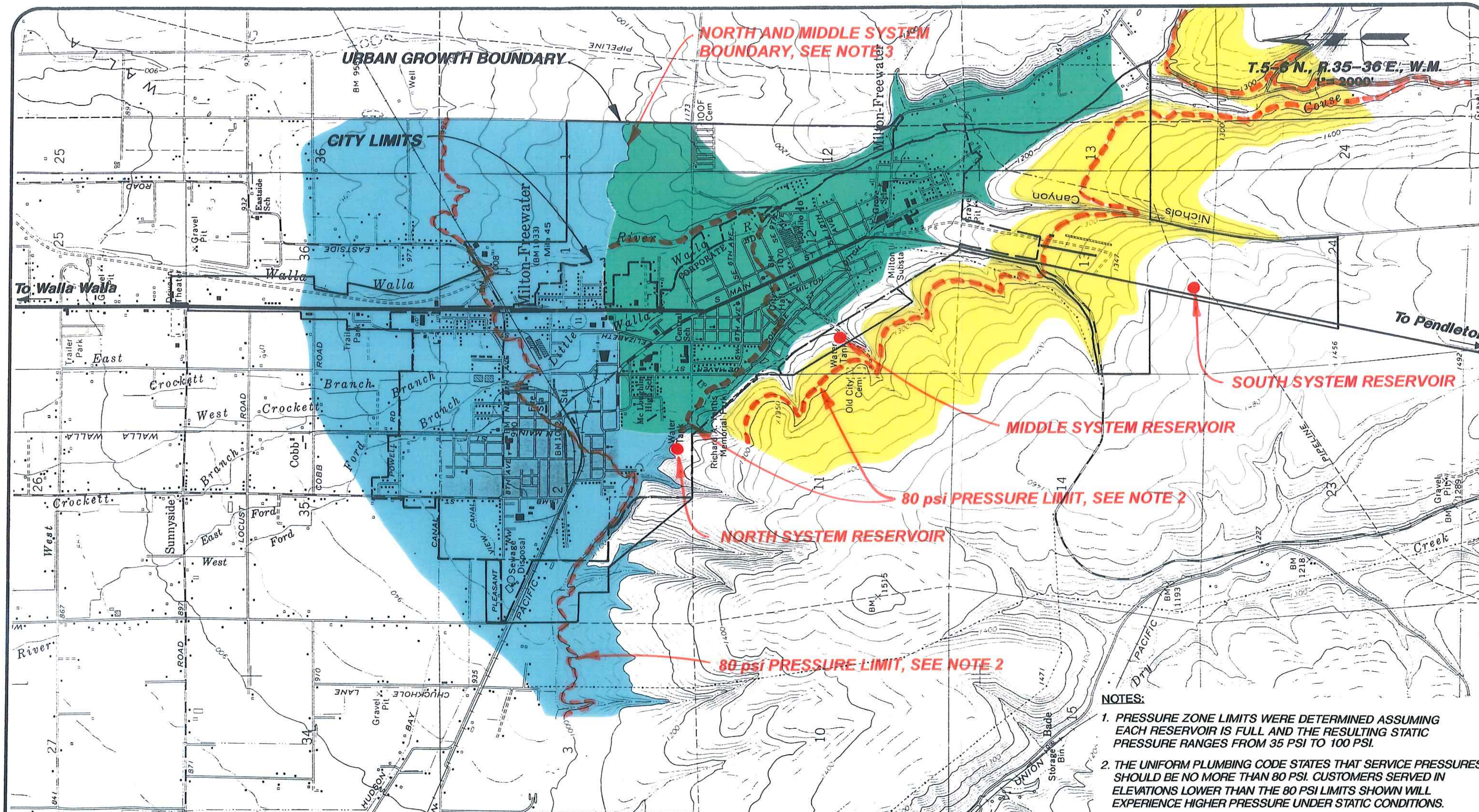
Summary of Storage Requirements. The four storage components indicate a total of approximately 5,618,900 gallons of storage is needed to meet the year 2028 design criteria (see Table 2-4). The City's current available storage total is 5,000,000 gallons. Due to the City of Milton-Freewater's multiple groundwater sources and the redundancy of the City's three-reservoir system, this 618,900-gallon deficit in storage capacity is not a significant concern for the City. This is justified because it is very unlikely that the fire reserve capacities evaluated for each reservoir will be used at the same time (a savings of 840,000 gallons of total water storage), combined with the fact that the large number of wells owned by the City provides increased flexibility in supplying water during emergency conditions. Therefore, it is not recommended that the City undertake a new reservoir project during the planning period (through the year 2028) unless water use conditions in excess of those predicted with this Plan are seen. If the City elects to begin to look at a new reservoir in the future, it is recommended that the City extend their focus beyond the planning period discussed in this Plan.

Water storage reservoirs, when properly maintained, typically remain usable for at least 40 to 100 years, or more. Because of this, should the City elect to construct a new reservoir, it may desire to select the size of the reservoir based on the projected population for the year 2048. The cost associated with construction of a larger reservoir is usually less when compared with constructing a smaller reservoir at one point and then another reservoir at a later date to meet the City's long-term storage needs. Based on the current estimated water use volumes, the selected 2.0 percent annual population growth rate, one day of emergency water storage, the design fire flow of 3,500 gpm, the City's three pressure zones, and assuming the City's total available water supply is 7,520 gpm (the total capacity of the City's wells), the City's year 2048 storage requirements are estimated to be approximately 7,952,000 gallons. This results in a storage requirement outside the City's current 5 million gallons of storage capacity of 2,952,000 gallons, which could be accommodated through a 3 MG reservoir.

The existing City reservoirs will need maintenance at some point in the future to remain in service. It is recommended that the City complete maintenance on the reservoirs to ensure they continue to remain in reliable service. Maintenance for the City's steel reservoirs would include a continued cleaning program and cleaning, sandblasting, and painting the interior and exterior of the Middle Reservoir to ensure it remains in good condition.

RECOMMENDED STORAGE RESERVOIR IMPROVEMENTS

The City should continue its current maintenance practices on the three existing reservoirs to ensure they continue to provide reliable storage. The Middle and North Reservoirs will likely need recoating during the planning period of this study. The interior and exterior of the steel Middle and North Reservoirs should be cleaned, sandblasted, and painted. A cost estimate for the recommended maintenance items on the Middle and North Reservoirs is presented in Chapter 6, Recommended System Improvements.



NOTES:

1. PRESSURE ZONE LIMITS WERE DETERMINED ASSUMING EACH RESERVOIR IS FULL AND THE RESULTING STATIC PRESSURE RANGES FROM 35 PSI TO 100 PSI.
2. THE UNIFORM PLUMBING CODE STATES THAT SERVICE PRESSURES SHOULD BE NO MORE THAN 80 PSI. CUSTOMERS SERVED IN ELEVATIONS LOWER THAN THE 80 PSI LIMITS SHOWN WILL EXPERIENCE HIGHER PRESSURE UNDER STATIC CONDITIONS.
3. THE BOUNDARY BETWEEN THE NORTH AND MIDDLE SYSTEMS IS SHOWN AT ITS TRUE LOCATION BASED ON CITY OPERATIONS, NOT ELEVATION SERVICE LEVELS.

LEGEND

	NORTH SYSTEM (EL. 950 TO EL. 1100 ABOVE MSL)	MSL	MEAN SEA LEVEL
	MIDDLE SYSTEM (EL. 1015 TO EL. 1165 ABOVE MSL)	PSI	POUNDS PER SQUARE INCH
	SOUTH SYSTEM (EL. 1235 TO EL. 1390 ABOVE MSL)		

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CITY OF
MILTON-FREEWATER, OREGON
WATER SYSTEM MASTER PLAN

PRESSURE ZONES

FIGURE 4-1

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CHAPTER 5

DISTRIBUTION SYSTEM

INTRODUCTION

This chapter discusses the existing water distribution system delivering water to the City's residential, commercial, and industrial users. Components of the distribution system include pipelines, valves, water service lines, and fire hydrants. The distribution system has been evaluated for both present and future City needs. Recommendations have been developed to address distribution system needs and provide future service to help meet both Department of Human Services - Drinking Water Program (DWP) requirements and ISO Commercial Risk Services, Inc. (ISO) fire flow requirements. Cost estimates for the recommended distribution system improvements are presented in Chapter 6, Recommended System Improvements.

EXISTING SYSTEM

Information related to the City of Milton-Freewater's water distribution system has been obtained from the City's computer-aided drafting (CAD) layout of the distribution system, City records, and conversations with Howard Moss, former Water System Superintendent. The system consists of approximately 45 miles of pipe, with 20 percent of the system having been installed in the 1940s or earlier. The water mains range from 2 inches to 20 inches in diameter with materials including asbestos concrete, cast iron, ductile iron, galvanized iron, polyvinyl chloride (PVC), Reinforced Concrete Pressure Pipe (RCPP), and steel pipe. The few areas in the City served by 2-inch lines were developed in the 1940s. Over the last few decades, replacement and installations have been made with C900 PVC pipe. A map of the existing distribution system is contained in a pocket at the end of this Plan.

In general, the distribution system is reported to have good hydraulic performance, is well looped (providing supply to developed portions of the City from two or more directions), and has relatively large diameter water distribution mains spread throughout the service area. The City indicated that the water main lines are generally in good condition. The City has an annual water main replacement program in place in order to alleviate local problems that may arise in the system.

DISTRIBUTION SYSTEM WATER QUALITY

The City obtains routine samples from the distribution system for analysis of total and fecal coliform. The City randomly obtains eight routine samples per month. For the period from July 5, 2001, through November 24, 2008, total and fecal coliform has not been detected in samples obtained during routine monthly sampling events.

The City also obtains samples from the distribution system biannually for chemical analysis of total lead and total copper. For the period from 1993 through 2007, concentrations of lead ranged from not detected to 0.005 milligrams per liter (mg/L). The Environmental Protection Agency (EPA) action limit for total lead in municipal water systems is 0.015 mg/L. Copper was detected at concentrations ranging from 0.058 to 0.14 mg/L. The EPA action level for copper is 1.3 mg/L. Based on the lead and copper analytical results from 1993 through 2007, all detected concentrations of lead and copper were less than their corresponding EPA action levels. A summary of the tests is included in the DWP's Water Quality Testing Summary in Appendix A.

Stagnant water in the distribution system can also lead to water quality problems. In a water distribution system the size of Milton-Freewater's, some dead-end mains are an unavoidable result of expanding the system to accommodate the City's growth. These dead-end lines can result in stagnant water sitting in the pipe for periods of time and decreasing water quality when demands are not high. The City has a program in place to flush these lines twice a year or as required when customer complaints are received.

EXISTING PRESSURE ZONES

The service elevation of the City's existing water system ranges from approximately 955 to 1,150 feet above MSL, or a difference of 195 feet, representing a static water pressure range of approximately 84 pounds per square inch (psi). A minimum pressure of 20 psi under all conditions is required by the DWP and an upper limit of 80 psi is suggested for residences in the State of Oregon's Plumbing Specialty Code, 2000 edition (based on 1997 Uniform Plumbing Code). Typically, pressures in the distribution system should be higher than the minimum pressure suggested by the DWP and can be higher than the suggested maximum residential pressure. Minimum distribution system pressures are generally considered to be 20 psi at the property line (as suggested by the DWP) while maximum system pressures can often reach about 90 to 100 psi in the distribution system.

In systems with significant elevation changes over a substantial service area, such as Milton-Freewater's system, the system must be divided into pressure zones that are designed to keep water pressure within reasonable operating ranges. Prior to the merger of Milton and Freewater, both of the cities operated their own water system. Shortly after consolidation, the decision was made to operate the systems at separate pressure levels. This decision was made based on the understanding that the Freewater system would not withstand the higher operating pressures of Milton's system. The pressure difference results from a 75-foot base elevation difference between the North and Middle Reservoirs (formerly the Milton and Freewater Reservoirs, respectively).

The City of Milton-Freewater currently operates three pressure zones in their distribution system. The North Pressure Zone serves the north area of the City of Milton-Freewater to a southerly limit of Broadway Avenue. The Middle Pressure Zone covers an area extending from Broadway Avenue to the south end of the City Limits, excluding a small area in the southwest portion of town. The third zone is relatively new and is called the South Pressure Zone. It serves the higher ground in the southeast areas of the City and further south along U.S. Highway 11 within the Urban Growth Boundary. Based on the layout of these pressure zones, it is possible that some customers in Milton-Freewater will experience pressures in excess of the 80 psi maximum service pressure suggested in the Plumbing Code. Where possible, each zone has been designed with a minimum static water pressure of 35 psi near the highest elevation in the zone and a maximum static water pressure of 100 psi near the lowest elevation in the zone.

Typically, customers will not complain about excessive pressure unless plumbing fixtures such as hot water heaters begin having pressure-related problems. A system such as Milton-Freewater's that has operated with these pressures for over 50 years is likely not going to have many over-pressurization-related problems because customer's systems have been installed to accommodate the pressures. However, any adjustments to the pressure zone boundaries could result in over-pressurization problems.

The North Pressure Zone has static pressures ranging from 65 psi at the south end of the zone up to 98 psi at the extreme north end of town near Powell Road. The North Pressure Zone can be supplied by the Middle Pressure Zone through a pressure reducing valve (PRV) located at the intersection of DeHaven Street and East Broadway Avenue. This PRV is normally closed but it is set to open when the North Pressure Zone system falls 20 psi below the Middle Pressure Zone. A separate isolation valve between these two zones is located at N.E. 1st Avenue and U.S. Highway 11. This valve is closed during normal system operation but can be opened in emergency conditions.

The Middle Pressure Zone creates static pressures of 100 psi near Broadway Avenue down to 40 psi at the higher elevations along the bluffs in the southwest area of the City. The lowest pressures are seen on Jacquelyn Street, which is located at the highest point in the service area on the southwest hillside.

Static pressures in the South Pressure Zone range from 50 psi near the Sykes Corporation to 126 psi at Well No. 9. The 100 psi static pressure corresponds to an elevation of approximately 1,235 feet, which creates a gap between the Middle and South Pressure Zones as discussed in Chapter 4, Water Storage. Operation of the South Pressure Zone is tied to the Middle Pressure Zone in two critical ways. First, booster pumps located at the Well No. 9 pump house are controlled by a pressure transducer at the South Reservoir, which activates the booster pumps when the reservoir level is low. Water is then drawn from the Middle Pressure Zone and pumped up to fill the South Reservoir. Second, water being fed out of the South Reservoir is then cycled back into the Middle Pressure Zone through a PRV located in the Well No. 9 Pump House. This PRV is set to allow a constant 40 gallons per minute (gpm) flow from the South Pressure Zone to the Middle Pressure Zone (to help circulation of water in the South Reservoir) and increase this flow when pressures drop in the Middle Pressure Zone.

FIRE PROTECTION

The City's water supply, storage, and distribution systems provide good fire protection. Fire flow tests were performed on some of the City's fire hydrants on April 8, 1987, by ISO. The results of the hydrant tests are summarized in Table 2-2 (Chapter 2) and presented in Appendix C. The observed and calculated fire flow discharges available from the hydrants tested are shown on Table 2-2. Based on the ISO test results, the City of Milton-Freewater's water system is generally able to deliver fire flows ranging from approximately 580 to 2,090 gpm with residual pressures remaining well above the minimum required 20 psi. The fire flow tests also utilize a theoretical formula to estimate available fire flows, which are much higher, as shown on Table 2-2 in Chapter 2.

It is important to realize that physical limitations exist in most water systems that do not normally allow fire flows as high as those calculated by the ISO tests. For example, the available fire flows determined by ISO using a theoretical formula assumes the water supply "feeding" the tested area is generally not limited and the 20 psi residual pressure resulting from the fire flow will occur in the general area of the fire hydrants that are tested. In reality, there are likely other connections in the distribution system, such as higher elevation users in the City, that would fall below 20 psi sooner than the formula predicts due to their elevation. In this situation, the theoretical formula over-estimates the available fire flows.

The fire flow tests completed by ISO were conducted by opening two fire hydrants at one time. Thirteen areas were tested (two hydrants at each area), and each hydrant provided flows ranging from approximately 580 gpm to 2,090 gpm. Realistically, individual fire hydrants can only provide flows in the range of 800 to 1,000 gpm from a small port to up to nearly 2,000 gpm from both small ports and the large "pumper" port, assuming the hydrant has a large port. To actually achieve the available fire flows at 20 psi indicated by the ISO calculations, several fire hydrants would need to be completely opened at one time.

Another limitation of actual fire flow capabilities is the supply of water feeding the area of the fire. The City's distribution system is well looped and has a good network of 8-inch diameter and larger water main lines. The capacity of the system to provide water flow is excellent. However, it must be understood that the water main lines supplying the distribution system from the City's reservoir will tend to limit the available fire flow as well. During a large demand on the distribution system, such as a fire flow, the 16-inch and 20-inch lines from the North and Middle Reservoirs can likely deliver flows in the range of 4,000 to 6,000 gpm and then smaller distribution lines branching off these main lines will further reduce the available flows due to hydraulic limitations.

Generally, the City's water system is capable of providing excellent fire flows and has an excellent fire rating from ISO. The discussion presented herein is intended to provide caution concerning the actual available fire flows from the City's distribution system and fire hydrants. Considering the limitations previously discussed, the City's water system appears capable of meeting the maximum recommended ISO fire flow of 3,500 gpm while maintaining 20 psi in the system where this type of flow is needed (i.e., commercial and industrial areas).

DISTRIBUTION SYSTEM PIPING IMPROVEMENTS

Some minor improvements to the distribution system are recommended. The improvements discussed in this section are intended to improve system circulation by providing looping and eliminating dead-end lines, where feasible. Some areas of water main lines in the City are reportedly cast iron and steel pipe that were most likely installed in the 1940s or earlier. The City intends to replace some of these main lines in the near future.

In general, the City's distribution system is in good condition and is well looped. However, approximately 70 dead-end lines were tallied throughout the City's water service area. This relatively high number of dead-end lines is attributable to the unique geological features of the area (i.e., rock bluffs, the Walla Walla River, etc.) that limit the extent to which ideal looped water systems can be constructed.

Table 5-1 summarizes the distribution system improvements currently planned by the City. Many of these improvements would replace aging main lines, improve system circulation, provide looping for existing dead-end lines, and improve fire flows throughout the City's water service area. It is recommended that these improvements are made with a minimum of 8-inch diameter C900 PVC or ductile iron water lines. The improvement list provided by the City is not presented in a particular priority. The City selects which improvements to implement based on several factors such as budget, other area utilities, pipe condition, planned paving projects, etc.

The City indicated that the majority of the residential service lines are in satisfactory condition. The older galvanized iron service lines are likely to develop leaks as time progresses, but it is anticipated that the City's meter testing and maintenance program will address service line work on an as-needed basis during the planning period of this Water System Master Plan. However, as a general rule, all service lines connected to a water main line should be replaced when the main line is upgraded.

WATER LOSS

One important monitoring activity that is currently being performed by the City is conducting a periodic audit of the volume of water supplied to the system versus the volume of water that is being metered and used by its customers. The difference between billed water use and total water supplied is termed "unaccounted for water." A system that has tight controls on its water consumption generally maintains at least 90 percent accountability for all water. That is, 90 percent of the water supplied to the system can be accounted for in usage through service meters, etc. Systems that have a water accountability of less than 90 percent should look for the cause of the water usage discrepancies and make corrections where possible.

The City has begun completing annual water audits. The water audit results for the most recent six years are presented hereafter.

WATER AUDIT RESULTS

Year	Gallons Produced	Gallons Sold	City Use (gallons)	Gallons Lost	Calculated Water Loss
2002	897,069,000	710,628,000	23,550,000	162,891,000	18.2%
2003	943,157,000	749,140,000	23,550,000	170,467,000	18.1%
2004	869,999,000	649,930,000	23,550,000	196,519,000	22.6%
2005	824,892,000	634,590,000	23,550,000	166,752,000	20.2%
2006	679,488,000	565,564,000	23,550,000	66,824,000	9.8%
2007	714,993,000	550,106,000	23,550,000	141,337,000	19.8%
2008	613,669,000	504,461,000	57,464,000	51,744,000	8.4%

The above results show that the City regularly experiences water loss in excess of 10 percent, but has observed water loss below 10 percent in 2006 and 2008. It is possible the older service mains and the service lines being served by these older main lines are a primary source for the unaccounted for water loss. The City should investigate all sources of potential water loss and make corrections where possible in an attempt to maintain at least a 10 percent water loss rate.

The City currently has a leak detection program in place that has led to the replacement of a leaking water main line from Well No. 8 to South Main Street. The City also has a meter change-out program in place. When suspected leaks are discovered by routine monitoring of flow records, the City determines the location of the leak and completes repairs as soon as practically possible. The City is also annually replacing portions of their pre-1940s steel water main lines, which has helped reduce water loss. By using these monitoring techniques to identify suspected leaks and replace old lines, the City is proactively using the Best Management Practices (BMPs) available to them to identify water losses and improve the distribution system.

MAINTENANCE RECORDS

One important operational function of the City's distribution system is to keep accurate records of various system components. These records become invaluable as time passes in terms of planning future improvements and replacing old or deteriorated components. It is recommended that the City keep accurate records on all water meters installed so that, in the future, these meters can be periodically pulled, checked for accuracy, and replaced as appropriate. The distribution system evaluation in this Water System Master Plan did not include determining existing fire hydrant and valve condition. It would be wise for the City to keep accurate records on all hydrants, valves, and other distribution system components. The City does currently check hydrants annually for proper operation. This program should be expanded to include all water valves, exercising them at least annually, with records kept on their operating condition, location, etc.

WATER MANAGEMENT AND CONSERVATION PLAN

One method available to the City to reduce possible water loss and help conserve water is to complete a Water Management and Conservation Plan (WMCP). The City completed a WMCP in 2000 and submitted it to the Oregon Water Resources Department (OWRD) (prepared by Anderson·Perry & Associates, Inc.). These plans are required by the OWRD as outlined in Oregon Administrative Rules (OAR) Chapter 690, Division 86. Completion of a WMCP is usually required when a City applies for a new water right from OWRD. If a WMCP is completed and some of the conservation measures are implemented, the City may find, after sufficient time has passed, that their average daily water use has reduced. By having a WMCP in place, the City will also be able to review applications for new wells within a five-mile radius of the City's wells and voice concerns to the Water Resources Department about potential impacts to the City's water source, as described in the Umatilla Basin Program (OAR 690-057) included in Appendix I.

The OARs applicable to WMCPs also require a 10-year update to the plans. The City is currently preparing an update to their 2000 WMCP. The updated WMCP will be available under separate cover in the summer of 2009.

SUMMARY AND RECOMMENDATIONS

In general, the City's distribution system provides good fire protection and, in most cases, is adequately looped. Some water main line improvements are recommended to enhance system reliability and hydraulic capacity and, where practical, eliminate dead-end lines. These improvements, as outlined in this chapter, include installing new water main lines in a few key areas to improve looping, circulation, and fire flow capacity. The recommended distribution system improvements and estimated costs for the improvements are outlined in Chapter 6, Recommended System Improvements.

DISTRIBUTION SYSTEM IMPROVEMENTS

Imp. No.	Description and Location of Improvements	Existing Size (in)	Existing Pipe Material	Year Installed	Approximate Length of Improvement (ft)
1	N Elizabeth, N of NE 11th to Parallel	2	Galvanized	1946	267
2	NE 11th, N Elizabeth to Parallel	4	Steel	1946	270
3	N Elizabeth, NE 10th North of NE 11th	4	Steel	1946	525
4	Miller, NE 4th to end	4	Cast Iron	1946	520
5	NE 1st and NW 1st, Well No. 3 to Depot	10	Steel	1946	765
6	Well No. 3, Russell to Broadway to DeHaven	12	Cast Iron	1946	690
7	DeHaven, Broadway to SW 2nd	12	Cast Iron	1947	1,450
8	SW 2nd, DeHaven to S Elizabeth	12	Cast Iron	1947	620
9	Catherine, Russell to Golf Course	2	Steel	1940	715
10	S Main, S Main NE to S Elizabeth	2	Steel	1945	680
11	S Elizabeth, S Main to near E Broadway	6	Steel	?	640
12	SW 3rd, Pierce to S Main	4	Steel	1940	380
13	S Elizabeth, SW 2nd to SW 5th and SW 5th, S Elizabeth to S Main	12	Cast Iron	1947	1,700
14	SE 7th, Mill to near George	4	Steel	1940	570
15	S Main, SW 5th to SW 10th	12	Steel	1940	1,920
16	SE 9th, S Main to Well No. 1	12	Steel	1940	280
17	SW 7th, S Main to near S Columbia	2	Steel	1940	230
18	Alley, Locust to SW 8th	4	Steel	1940	1,140
19	SE 9th, S Main to S Mill	4	Steel	1940	350
20	Alley, SE 9th to SE 10th	2	Steel	1940	260
21	SW 10th, S Main to Alley	4	Steel	1940	170
22	SE 10th, S Main to near S Mill	2	Steel	1940	270
23	S Mill, SE 9th to SE 11th	8	Steel	1940	590
24	NW 11th, Evans to N Main	4	Steel	1946	400
25	N Main, 270' n to 210' s of NW 11th	2	Galvanized	?	480
26	NW 10th, Lamb to end of NW 10th	4	Steel	1953	620
27	Perkins, NW 8th to NW 10th and NW 10th to Perkins to Evans	4	Steel	1946	920
28	Ward, NE 8th to alley at Hudson Bay and Ward to Robbins alley to 420' south	4	Steel	1946	1,210
29	NE 9th, Ward to dead end alley to 420' south	2	Steel	1946	250
30	Robbins, NE 8th to NE 7th	4	Steel	1940	320
31	NE 7th, N Main to Russell	4	Steel	1940	780
32	NW 6th, Lamb to Evans	8	Steel	1945	860
33	Helen, NW 6th to NW 7th	4	Steel	1945	370
34	NW 7th, Lamb to Vining	4	Steel	1946	480
35	Evans, NW 6th to NW 8th	4	Steel	1946	660
36	NW 6th and NE 6th, Evans to Ward	6	Steel	1946	1,120
37	Alley between Robbin, NE 6th to midblock south	6	Steel	1946	180
38	NW 5th, Lamb to Evans	6	Steel	1946	840
39	Evans, NW 5th to NW 4th	6	Steel	1946	280
40	NE 6th and Russell, East 470' then south 260' to Well No. 5	8	Steel	1940	730
41	West Broadway, Casco to Depot	4	Steel	1940	760
42	NW 1st and Depot, Northerly to NE 4th and N Main	6 and 8	?	1940	900
43	Alley between N Main, NE 5th to near NE 4th	2	?	1940	200

CHAPTER 6

RECOMMENDED SYSTEM IMPROVEMENTS

INTRODUCTION

This chapter summarizes the recommendations of the Water System Master Plan and outlines the estimated costs of the proposed water system improvements. Detailed descriptions of the proposed improvements for the water supply system, storage system, and distribution system are included in Chapters 3, 4, and 5, respectively.

SUMMARY OF PROPOSED SYSTEM IMPROVEMENTS

Relatively few improvements were identified for the City of Milton-Freewater's water system in the analysis associated with this planning effort. All of the deficiencies noted and improvements recommended to improve these deficiencies are summarized hereafter. Because of the nature of the City's needs, some of the improvements are considered to be of higher priority than others. Later in this chapter, the improvements are prioritized based on the City's most important water system needs.

It should be noted that the costs for the improvements summarized below anticipate a public bidding process. The City has successfully completed several system improvements with their own staff and may choose to do so with some of these improvements. These cost estimates may need to be adjusted if the City chooses to make the improvements themselves.

Water Supply Improvements. Water supply improvements are recommended in order to connect City Well No. 1 to the Middle Reservoir. This transmission line is intended to deliver water with entrained air from the well directly to the reservoir where the entrained air can dissipate under atmospheric conditions. Table 6-1 presents a summary of the estimated year 2009 cost for this improvement.

Water Storage Improvements. Recommended water storage improvements are related to maintenance of the City's existing reservoirs. They include cleaning, sandblasting, and painting the interior of the Middle Reservoir and the interior and exterior of the North Reservoir.

For estimating purposes, it was assumed the exterior of the North Reservoir will be over-coated with polyurethane (due to lead-based primer containment concerns), while the interior of the reservoir will have a two-component epoxy-based coating applied. The interior of the Middle Reservoir will also have the two-component epoxy-based coating applied. Interior preparation and painting costs are estimated to be $4.25 per square foot, while exterior preparation and painting costs are estimated to be $3.50 per square foot. With these assumptions, the estimated costs for coating maintenance on the North and Middle Reservoirs are as follows:

RESERVOIR COATING COST ESTIMATES

	Interior Coating Cost	Exterior Coating Cost	Total Coating Cost	35 Percent for Additional Costs (See Note Below)	Total Estimated Cost
North Reservoir	$111,100	$67,700	$178,800	$62,600	$241,400
Middle Reservoir	$67,600	$0	$67,600	$23,700	$91,300
TOTAL ESTIMATED COST					**$332,700**

Note: Additional costs include design and construction engineering, permitting, legal, and a 10 percent construction contingency.

Water Distribution System Improvements. Water distribution system improvements planned by the City are identified in detail in Chapter 5. The year 2009 recommended distribution system improvements are estimated to have a construction cost of $80.00 per foot for 8-inch water line improvements (replacing all existing pipes 8 inches and smaller, as listed in Chapter 5), and $88.00 per foot for 12-inch improvements (replacing all existing 12-inch pipes, as listed in Chapter 5). These unit costs account for a valve located every 250 feet, a connection to an existing pipeline every 250 feet, hydrants placed every 750 feet, water service replacements every 150 feet, half of the trench surface restoration costs being asphalt, and half being gravel surfacing.

Increasing these unit costs by 35 percent to account for administration, legal, engineering, permitting, and construction contingency results in unit costs of $108 per foot for 8-inch water lines and $119 per foot for 12-inch water lines. The total length of the 8-inch improvements listed in Chapter 5 is estimated to be 19,937 feet, while the proposed 12-inch improvements is estimated to be 7,425 feet. This results in total costs of $2,153,196 for the 8-inch improvements and $883,575 for the 12-inch improvements, for a total project cost of $3,036,771. These cost estimates assume a public bidding and contracting process and take into account all costs described above. If City crews are able to perform this work, it is estimated that these costs would be reduced.

PRIORITY OF IMPROVEMENTS

The water system improvements summarized in this chapter are important to help meet the City's year 2028 water system needs. Because some needs may be of higher priority, the City may wish to complete the improvements in a phased approach. If a phased approach is selected, prioritizing the improvements becomes important to help ensure the City's most important water system needs are addressed first. Outlined in the following table is the recommended priority for the water system improvements described in this Master Plan.

PRIORITY OF WATER SYSTEM IMPROVEMENTS

Priority	Improvement	Reason for Priority Ranking
A	Connecting Well No. 1 to the Middle Reservoir	Allows all water supply sources to be used on a daily basis and reduces the burden on other City wells.
B	Painting of Middle and North Reservoirs	Prevents further deterioration of existing reservoir coating and the potential damage to reservoir components.
C	Distribution System Improvements	Replaces aging main lines, provides looping for dead-end lines, improves water quality, and provides improved fire protection.

Increasing the City's supply capacity by bringing the existing air-entrained Well No. 1 back online for daily use should be considered the highest priority improvement to the water system. This would help reduce the additional hours that the City's wells are currently operating to meet peak daily demands. It would also allow the City to better provide enough supply to meet projected peak daily demands through the year 2028.

The next priority should be maintenance related to the City's North and Middle Reservoirs. The information obtained from the cleaning and inspection of the North and Middle Reservoirs by LiquiVision, Inc., indicates that the Middle Reservoir is in need of interior painting. The North Reservoir will likely need recoating within the planning period of this study. These projects should be undertaken by the City within the next five to ten years, if possible, to ensure that corrosion does not begin to deteriorate reservoir appurtenances to a degree that requires replacement.

Finally, the City could complete the recommended distribution system improvements to upgrade aging main lines, help eliminate dead-end lines, improve water quality, and increase fire flows in key areas of the City.

COST SUMMARY

The year 2009 estimated project costs for Priority A, B, and C water system improvements are summarized below. If improvements are completed after 2009, updating the construction costs to account for inflation and more current construction conditions will be required. The total estimated costs are briefly summarized as follows:

- Priority A Improvements (new transmission line from Well No. 1 to Middle Reservoir): $181,000
- Priority B Improvements (North and Middle Reservoir painting): $332,700
- Priority C Improvements (distribution system improvements): $3,036,771

The total estimated water system improvements project costs outlined above are \$3,550,471. Again, these estimated costs assume the public bid process is utilized, the improvements require design and construction engineering services, and a 10 percent construction contingency is included. If the City is able to complete some of these improvements using City crews, the costs will likely be less.

ESTIMATED COST
SUPPLY SYSTEM IMPROVEMENTS
(YEAR 2009 COST)

NO.	ITEM	UNIT	UNIT PRICE		ESTIMATED QUANTITY	TOTAL PRICE	
SUPPLY SYSTEM IMPROVEMENTS							
12-inch Transmission Line Extending Southwest on 9th Avenue from City Well No. 1, across Main Street, then Northwest on S. Columbia Street, Tying into Existing Transmission Line from Well No. 2 to the Middle Reservoir							
1	Mobilization (5%)	LS	$	5,500	All Req'd	$	5,500
2	12-inch Water Line	LF		50	800		40,000
3	Bored and Jacked Main Street Crossing	LS		60,000	All Req'd		60,000
4	12-inch Valves	EA		1,800	3		5,400
5	Connect to Existing Line	EA		1,000	2		2,000
6	Surface Restoration - Asphalt	SY		45	400		18,000
7	Surface Restoration - Gravel	SY		8	400		3,200
	Subtotal Construction Costs					$	134,100
	Administration, Legal, Engineering, Permitting, and Contingency at 35%						46,900
	Total Year 2009 Estimated Cost					**$**	**181,000**

anderson perry & associates, inc.

CITY OF
MILTON-FREEWATER, OREGON
WATER SYSTEM MASTER PLAN
ESTIMATED COST
SUPPLY SYSTEM IMPROVEMENTS

TABLE
6-1

CHAPTER 7

PROJECT FINANCING

INTRODUCTION

This chapter evaluates the financial status of the City's Water Department and outlines alternatives for financing the water system improvements outlined in this Plan. For analysis purposes, it was assumed the City would implement the improvements outlined in Chapter 6 as a single project. These financial alternatives include state and federal grants and loans, as well as financing options for providing the local funding share. In order to construct the proposed improvements as a single project, a financing plan that is acceptable to the citizens of Milton-Freewater would need to be developed to complete the needed improvements. Financing resources available to fund the improvements could include both local funding and available outside loan funding.

Although a detailed analysis of Milton-Freewater's current water rate structure is beyond the scope of this Plan, some discussion of the existing rate structure and current and future water system budgets is included. As a general rule, most utility rate structures include funding for periodic minor system improvements and maintenance items, payroll costs for staff, and an amount to be set aside for future improvements. The majority of the discussion in this chapter will center on available state and federal grant and loan programs that will be important to Milton-Freewater in the decision-making process, and methods of developing the local share needed for the project.

CURRENT WATER USE RATES AND REVENUE

The operation and maintenance of the existing water system is financed through the City's annual budget. Revenue is obtained primarily from water user fees. Water rates (per month) that were current at the time of this study and which have been in effect since July 1, 2008, are summarized in the following table.

WATER RATE INFORMATION

BASE CHARGE		
Account Type	**Connection**	**Base Monthly Rate**
Residential and Commercial	All	$ 17.22
Motels, Assisted Living, Industrial, and Government	1-1/2" 2" 3" 4" 6" 8" 10"	$118.75 $173.42 $230.78 $454.91 $624.36 $815.10 $989.95

USAGE CHARGES		
Account Type	**Usage**	**Per 1,000 gal/month**
All	0 to 5,000 gallons 5,000 to 500,000 gallons Over 500,000 gallons	Minimum charge $ 1.25 $ 0.81

These water rates are the Water Department's sole source of revenue, and no taxes are assessed to support the water system.

As of August 2008, the City of Milton-Freewater had the following number of water service connections that were metered and billed:

WATER SERVICE CONNECTIONS

Connection Type	Total Number of Connections
Residential	2,013
Commercial	240
Industrial	23
Total Connections	**2,276**

Some of the accounts listed above include more than one user connected to a single, or master, meter. For example, a duplex in Milton-Freewater that has one meter has been counted as one connection but is charged twice the minimum monthly fee per unit and is counted as two accounts. After review of billing information provided by the City, it was determined that the City has a total of 2,276 connections and 2,911 billable accounts.

The revenue generated annually by the City's Water Department is presented in Table 7-1. As shown in Table 7-1, the City has multiple revenue sources contributing to the Water Department fund. For the purpose of this planning study, three sources of income are anticipated to provide continued stable and reliable revenue to the Water Department fund. These revenue sources are related to water user fees (services), water service installations (water meter sales), and system development charges. These three revenue sources will be referred to as the water system sources in the following discussion.

The annual revenue generated from the water system sources over the period from 2003 through 2009, with fiscal year 2008-09 budgeted numbers, is shown in the following table, along with the City's population. Revenue from the water system sources has increased at an average annual rate of approximately 3.9 percent per year from 2003-04 through 2008-09, including the increased revenue from raising the minimum monthly water rate in July 2006 and again in July 2008. Using an annual user fee revenue amount of approximately $1,094,700 for 2008-09, as shown in Table 7-1, and assuming 2,911 accounts, the City currently has an average monthly water user fee of approximately $31.32 per account. This shows that the City's overage rates and rates for larger meter connections are substantially increasing the Water Department revenues.

REVENUE FROM WATER SYSTEM SOURCES

Fiscal Year	Population	Revenue from Water System Sources
2003-04	6,500	$919,268
2004-05	6,540	$945,447
2005-06	6,585	$976,176
2006-07	6,550	$1,045,292
2007-08	6,550	$1,092,455
2008-09*	6,550	$1,228,100

*2008-09 are budgeted numbers.

CURRENT FINANCIAL STATUS

Existing Debt. The City of Milton-Freewater currently has two outstanding general obligation bonds on the water system. These bonds are summarized in the following table:

OUTSTANDING GENERAL OBLIGATION BONDS

Original Amount	Year Issued	Year Debt Expires
$465,000	1994	2013
$1,815,000	1997	2018

The annual principal and interest payments remaining for both loans are approximately $183,840 per year through 2013, then approximately $145,697 per year until the year 2018.

Annual Water System Costs. The annual cost of operating, maintaining, and making improvements to Milton-Freewater's water system is summarized in Table 7-2 for fiscal year 2003-04 through the current budget year, 2008-09. The costs presented include all costs for the water system. The City's annual expenditures have been increasing over the last five years at an annual rate of approximately 5.3 percent.

In order to simplify the complex array of revenue sources and expenditures, the annual revenue from water system sources (services, water meter sales, system development charges, merchandising, and interest income) has been compared with annual total operation and maintenance (O&M) costs, debt service costs, and inter-fund transfers. The table below presents this information.

ANNUAL WATER SYSTEM REVENUE VS. EXPENDITURES

Fiscal Year	Revenue from Water System Sources[1]	O&M, Debt, and Transfer Expenditures	Balance
2003-04	$919,268	$922,727	($3,459)
2004-05	$945,447	$969,421	($23,974)
2005-06	$976,176	$957,799	$18,377
2006-07	$1,045,292	$1,071,916	$26,624
2007-08	$1,092,455	$1,073,769	$18,686
2008-09[2]	$1,228,100	$1,196,335	$31,765

[1] Includes revenue from water user fees (services), water service installations (water meter sales), and system development charges.
[2] 2008-09 data are derived from the City's budget.

The positive balances since 2005-06 show that operation of the City's water system has been adequately funded over this period. The surplus of revenues from water system sources over O&M, debt service, and transfer expenditures has averaged approximately $23,863 annually over the last four years. The historical trends for these revenues and expenditures are shown in Figure 7-1, along with a projection of future expenditures. By plotting a "trend" line for the expenditures, the anticipated expenditures in a future year can be determined, assuming no changes in the water system occur. This trend line shows that O&M, debt, and inter-fund transfer expenditures are anticipated to increase to approximately $1,200,000 in fiscal year 2009-10.

WATER SYSTEM IMPROVEMENTS FUNDING

In order to accomplish the water system improvements discussed in Chapter 6, the City may consider outside funding assistance. A number of state and federal grant and loan programs can provide assistance on municipal improvement projects to cities, counties, and utility districts. These programs offer various levels of funding aimed at different types of projects. These include programs administered by the Oregon Economic and Community Development Department (OECDD), Rural Development (RD) under the U.S. Department of Agriculture, the U.S. Economic Development Administration (EDA), and others. These agencies can provide low-interest loan funding and possibly grant funding for assisting rural communities on public works projects. Most of these agencies require increases in existing water rates to support loans for system improvements both as a condition of receiving monies and prior to being considered for grant funds. Some of the funding programs provide funding only if the improvements address documented water quality compliance issues.

As many of the proposed system improvements will most likely be constructed in the future, it is likely changes will occur in funding availability and selection criteria. The following is provided to show the current state of the programs and the nuances of funding available now. Funding alternatives should be reevaluated in the early phases of a project that is ready to be initiated.

SUMMARY OF STATE AND FEDERAL GRANT AND LOAN PROGRAMS

The following section briefly summarizes the primary funding programs available to assist the City with a water system improvements project. The programs are generally presented in order of most likely applicability to the City. Some funding programs require a water quality problem for funding eligibility. As the City's projects are generally not based on a water quality issue, funding from these sources is not likely unless the City's situation changes or a water quality issue arises. However, the information is presented herein for completeness and for the possibility of future applicability to the City's needs.

(1) In conjunction with the Oregon Drinking Water Program (DWP), the OECDD administers the ***Safe Drinking Water Revolving Loan Fund (SDWRLF)***. This program receives a federal funding allocation each year. Although Letters of Interest can be completed at any time, they should be submitted during the annual Letter of Interest process, which typically occurs in the spring of each year. This program provides loans with interest rates around 4.5 percent for a 20-year term, but as low as 1 percent for a 30-year term for communities meeting hardship criteria. Projects are ranked by the following criteria: projects addressing serious human health risks, projects to assure compliance with the Safe Drinking Water Act, and water systems in need based on affordability criteria.

Revisions to the SDWRLF have been implemented for the purpose of making loan funds more affordable to lower income communities. OECDD has developed a "Disadvantaged Community" status in the SDWRLF program where communities that qualify can be eligible for a "hardship criteria" loan interest rate of 1 percent for a 30-year term and for "principal forgiveness" (essentially a grant) up to $250,000 or 25 percent of the total loan amount, whichever is less. To evaluate eligibility for Disadvantaged Community status, the following criteria must be met:

a) Funding from any source being evaluated for the improvements project must result in a community's monthly residential water cost for 7,500 gallons of water exceeding 1.48 percent of the 2000 median household income (MHI). Based on the 2000 Census, the MHI in Milton-Freewater is $28,365. A monthly residential water fee corresponding to 1.48 percent of this MHI would be approximately $34.98 per month. The monthly residential water cost must include all OM&R costs, existing debt cost, and the anticipated additional monthly cost for the new debt. If the monthly costs charged to residential customers to meet all these obligations exceed 1.48 percent of the 2000 MHI, then the community meets the Disadvantaged Community status and is eligible for hardship criteria funding, pending further evaluation, as summarized hereafter.

b) The total loan amount of the project is then reevaluated at the hardship criteria interest rate of 1 percent for a 30-year term. The total loan amount may also be reduced by the principal forgiveness amount, which may not exceed the lesser of $250,000 or 25 percent of the total SDWRLF award for the project. If the resulting monthly water cost charged to residential customers to cover the existing OM&R, existing debt service, and new loan at the 1 percent rate is still equal to or greater than 1.48 percent of the 2000 MHI, then the community qualifies for the hardship criteria rate and principal forgiveness. If the resulting average monthly water cost required to meet all obligations is less than 1.48 percent of the MHI, then the community does not qualify for the principal forgiveness.

A preliminary analysis of the City of Milton-Freewater's existing water rates, debt service, and OM&R costs indicates that the City may be able to qualify for the Disadvantaged Community status or the hardship criteria loan with principal forgiveness if all improvements outlined in Chapter 6 were pursued at one time. The SDWRLF program is a good source of loan funds for potential water system improvements.

(2) Another potential funding source is the ***U.S. Department of Agriculture, Rural Development (RD)*** program (formerly known as Farmers Home Administration). This agency can provide financial assistance to communities through both loans and direct grants. Under the loan program, the agency purchases local bonds. The interest rate for these bonds is dependent on the MHI of the community and other factors, and varies from year to year based on other national economic factors. Application for this type of funding is a fairly lengthy process involving a detailed application, environmental review, etc.

The grant fund eligibility under the agency's current rules is dependent upon the City's MHI in comparison with the 2000 Oregon non-metropolitan MHI. Currently, RD is using a non-metropolitan MHI of $41,230 as the basis for grant fund eligibility. The City's current (2000 Census) MHI is $28,365. When comparing the City's MHI with the non-metropolitan MHI, Milton-Freewater would likely qualify for grant funding through RD. However, RD's grant funds are limited and generally very competitive to obtain. The interest rate for RD loans typically varies between 4.0 and 4.5 percent with a repayment period of 40 years if grant funds are provided. The repayment period can be reduced if only loan funds are provided.

The equivalent monthly water rate must provide sufficient revenue to pay for all system operation and maintenance costs, any existing debt service, and the local debt service incurred as a result of the project. Project costs above this level may be paid for by grant funds, which is typically a maximum of $1,000,000. A general rule is that RD requires 20 percent of the project to be funded through other sources. The objective of the RD loan/grant program is to keep the cost for utilities in small rural communities at a level meeting RD's definition of affordable and similar to what other communities are paying. Currently RD requires a monthly water rate of approximately $46.00 to 48.00 per month to be eligible to receive grant funds.

Another of the agency's requirements is that loan recipients establish a reserve fund of 10 percent of the bond repayment. If a city does not have these reserves available, they can be established during the first 10 years of the project, effectively making the net interest rate a little higher. The RD program also requires cities to establish either revenue or general obligation bonds to guarantee the loan. The RD program also allows project costs previously incurred by the city, interest paid on interim financing during construction and, in some cases, existing debt to be financed as part of the project.

RD should be considered a potential source of funding for the City's water system improvements. However, RD would likely serve only as a loan source to fund the project since high rates are required to be eligible for grant funds.

(3) The State of Oregon has developed the ***Oregon Bond Bank*** as a loan source available to cities for improvement projects. The OECDD also uses the Bond Bank as the source of loan funds for the Water/Wastewater and Special Public Works Fund programs (described below). Periodically, the State of Oregon sells bonds, using the state's credit rating, to maintain a pool of money that the State can, in turn, loan out to cities, counties, and special districts. The state pays the bonding costs and buys down the interest rate a small amount. Interest rates for loans from the Bond Bank are typically around 5 to 6 percent. Local government agencies can finance a loan obtained from the Oregon Bond Bank based on either a local general obligation bond election or a local revenue bond authorization; either way the interest rate is the same. Applications for loans through the Oregon Bond Bank are accepted at any time by the state. This loan source is attractive to small communities because of the slightly lower interest rate and because the local government is not faced with expensive bonding costs. This program is not as appealing as financing through other programs with potential grants or low-interest loans.

(4) The OECDD also administers the ***Water/Wastewater*** financing program. This program uses Oregon Lottery funds to help municipalities make improvements to their drinking water and wastewater systems. Project eligibility is generally limited to those projects necessary to ensure compliance with drinking water quality standards administered by the DWP or water quality statutes, rules, orders, or permits administered by the Department of Environmental Quality (DEQ). A project may also be eligible for funding from this program to assist in

bringing the system into compliance with requirements proposed to take effect within the next two years or if the DWP indicates there is a high probability that the system owner will soon be notified of non-compliance.

Funding from this program can be in the form of loans and/or grants. Determination of the final amount of financing available for a specific project, and the loan/grant mix, is based on several factors including the financial strength of the municipality, per capita income of the applicant, existing water and sewer rates as compared to a statewide average, and more.

For reduced rate loans and grants, this program requires that the recipient has a monthly residential rate for 7,500 gallons of water of at least 1.48 percent of the 2000 statewide MHI. As discussed earlier, a monthly residential water fee corresponding to 1.48 percent of this MHI would be approximately $34.98 per month for Milton-Freewater. The City's current monthly residential water fee for 7,500 gallons is $20.35. This is approximately $14.50 under where it would need to be to establish rates at 1.48 percent of the MHI. A water rate increase would be necessary to meet the threshold rate requirement. Therefore, the City does not currently qualify for low-interest loans and/or grant funds. It is possible this criteria could be met in the future due to rate increases that may be necessary to cover rising OM&R costs and/or repay additional loans the City may incur to finance water system improvements.

If the City were to become eligible for grants under the above criteria, a maximum $750,000 grant may be available for communities with an MHI less than the statewide MHI. Since Milton-Freewater's 2000 MHI ($28,365) is less than the statewide MHI ($41,662), the maximum amount of grant funds the City could potentially qualify for is $750,000. However, if the City is eligible for a grant through this program, the grant award is usually split at least 50/50 with the loan amount. Often, the loan amount is higher due to the requirement to reach the target water rate, so the loan typically exceeds 50 percent of the project cost. Typically, these loans are tied to the Oregon Bond Bank, as previously discussed.

Funding from this program would require a proposed project that is associated with a documented compliance issue, which is not the case at this time.

(5) The OECDD is also responsible for administering the ***Oregon Community Development Block Grant (OCDBG)*** program. Funding for this program is provided on an annual basis by the U.S. Department of Housing and Urban Development.

Projects that qualify under the Public Works category of the OCDBG program include municipal sewer and water system improvement projects that are user-rate dependent. The community must be primarily residential in nature and the proposed project must primarily benefit city residents. The funds available from this program are limited to $1,000,000 per community per project or $20,000 per permanent residential connection benefited by the project, whichever is less.

Those projects necessary to ensure compliance with drinking water quality standards administered by the DWP or water quality statutes, rules, orders, or permits administered by the DEQ are given highest priority under this program. The OECDD considers factors such as the ability of the users to fund the project locally, the urgency of the area's need, the cost in grant dollars per person benefited by the project, and how well the project is targeted toward meeting the national objective of primarily benefiting persons of low to moderate income.

The OECDD, through its OCDBG program, gives water improvement projects that address documented health problems highest priority for funding. The agency does not fund projects that are targeted toward water quantity problems or growth related problems. The OCDBG program also requires the community to have 51 percent or greater low to moderate income residents. The City of Milton-Freewater's percentage of low to moderate income residents is approximately 53.2 percent based on the 2000 Census, which meets this aspect of the program's criteria.

As with the Water/Wastewater financing program, to qualify for this funding source the average residential water rates must be at least 1.48 percent of the 2000 MHI. As previously discussed, the current rate would need to be increased $14.50 to approximately $34.98 per month to qualify for grant funds.

(6) The OECDD is the administrator of the ***Special Public Works Fund*** program, which is funded by monies from the Oregon Lottery. Funds from this program can be made available for either the purpose of improving public facilities or enabling the community to be in a position to serve additional commercial and industrial businesses. Loan funds are normally available through this program to be utilized by cities and counties for public utility improvements. The interest rate for loans through this program is generally tied to the Oregon Bond Bank, as discussed earlier. The program also offers grant funds once specific loan capacity limits are met, and when economic growth and the creation of new jobs or retention of jobs can be tied to the project. Unless a project can be tied directly to the creation of new family wage jobs or the retention of existing jobs, a project will not be in a competitive position to receive loan and/or grant funds under this program with the limited funds that are available.

If Milton-Freewater desires to move forward with a project involving funding alternatives as presented above, it is important for the City to consult with funding agencies early to ascertain which programs the City would be eligible to receive funding from for the proposed improvements. This consultation with funding agencies is usually done through a "One-Stop Meeting" where representatives of major funding agencies meet with the City to discuss the project and funding needs and identify the funding program best suited for the project. These meetings are typically held in Salem, Oregon. Once the meeting is concluded, the City is then invited to submit a Project Intake Form. OECDD utilizes a Project Intake Form to outline a city's project, including the needs, project requirements, affected area, estimated project cost, timeframe, schedule, etc. OECDD evaluates the project based on information collected for the Intake Form to determine the best funding program suited to the project. OECDD then invites the City to submit a funding application to the particular funding program identified to best fit the City's needs. The One-Stop Meeting and Project Intake Form process can be completed at any time.

The remainder of this chapter focuses on evaluating funding options for the City's water system improvements, assuming improvements are funded entirely by a loan, which represents the most likely scenario for the City of Milton-Freewater.

PRELIMINARY EQUIVALENT DWELLING UNIT ANALYSIS

When projecting future revenue for a water system, an Equivalent Dwelling Unit (EDU) analysis is usually completed. One EDU is intended to represent the average residential water use for a given city. As an example, each residential connection in Milton-Freewater would represent one EDU. A commercial connection user with water use amounts similar to the average residential use amount would also be considered one EDU. A commercial connection such as a cafe, with three times the typical water usage as an average residential connection, would be considered three EDUs.

An analysis of the City's water service accounts was completed in 1999 to provide a preliminary EDU determination. For that analysis, the City provided total annual water use records for the period from August 1998 through August 1999 for all accounts. The total annual water use of all residential accounts for that period was determined to be 411,389,000 gallons. This total use, divided by 2,648 billable residential accounts, results in an average monthly residential water use volume of 12,946 gallons (155,358 gallons/year). This average residential water use volume was then divided into the total water use for commercial, public, and industrial accounts to estimate the EDUs for each category. The preliminary results are summarized in the following table.

PRELIMINARY EDU ANALYSIS

Connection Type	Total Number of Connections	Total Number of Billable Accounts	Estimated EDUs
Residential	2,013	2,648	2,648
Commercial	240	240	988
Industrial	23	23	946
Total	**2,276**	**2,911**	**4,582**

Some funding agencies will use this type of EDU evaluation as a basis for estimating future yearly revenues and debt capabilities for a city. The EDU determination, which is based on water consumption, is intended to equitably distribute water costs among all users. The EDU determination helps funding agencies determine the maximum loan (debt) amount a city must meet prior to being considered for grant funds. For Milton-Freewater, the analysis presented later in this chapter shows that the City can complete a water system improvements project by obtaining only a loan or funding the improvements themselves. Many funding sources that provide only loans do not always require an EDU determination. Some of these agencies may only require a city's water rate structure to be equitable and to demonstrate that sufficient revenue can be generated to pay the required annual debt payment. Since this type of funding would most likely be obtained by the City of Milton-Freewater, the analysis presented hereafter for the City's future water rate revenue and estimated debt capacity is based on the current estimate of 2,911 billable accounts, not the preliminary EDU determination of 4,582. This will result in a more conservative estimate of the City's debt capacity.

DEBT CAPACITY

In order to determine the City's ability to fund a water system improvements project, Table 7-3 was prepared. Several assumptions were made as follows:

1. Water usage revenue is based on the number of water service accounts, which is estimated to be 2,911.

2. Operations, maintenance, and replacement (OM&R) costs for the budget year 2009-10 were set at $572,000 per year. The budget year 2009-10 was used as this would be the earliest time period in which a project could be initiated.

3. Existing bond payments were set at $183,000 per year.

4. Inter-fund transfers were set at $445,000 per year based on the three most recent years (2005-06 through 2007-08).

5. Debt service was calculated at 5.0 percent interest for a 20-year repayment period.

The data shown on Table 7-3 provides a general idea of the amount of debt the City could afford to service. Based on this information, it does not appear that the City could afford to service any debt with their current average monthly water cost of approximately $30 per account. This indicates the City may need to increase the base rate or the overage fees in order to increase revenue should the City seek a loan for water system improvements projects in the future. The various funding programs previously described in this chapter have differing thresholds established for grant assistance. In Milton-Freewater's case, average user rates would need to be approximately $35 to $45 or more per month in order to qualify for many of these grant assistance packages.

As stated above, it is important to note that the estimated bond debts shown in Table 7-3 and the average water use costs are based on 2,911 billable water service accounts, not the preliminary estimate of 4,582 EDUs. If the same evaluation were made assuming 4,582 EDUs, the evaluation would show that the City could afford to service a higher debt for the same monthly base water rate cost. It should be recognized that this is only a very preliminary analysis, and the assumptions and figures should be refined if project implementation proceeds in the future and when agreements are worked out with funding agencies.

PROJECT FUNDING

Based on the estimated debt capacity of the City's Water Department, and the estimated cost of the water system improvements discussed in Chapter 6, it may be possible to obtain grant funds for the project if the City were to pursue all improvements outlined in Chapter 6 at one time. Of the various loan funding programs, the most likely sources of funding would be a loan from Rural Development or a loan from the Safe Drinking Water Revolving Loan Fund. Funding sources for a loan, other than the state and federal funding agencies outlined herein, may be available to the City at competitive rates. If an improvements project is pursued, it is recommended that the City thoroughly investigate other loan sources to ensure the most competitive rates and terms are obtained for the project.

One-Stop Meeting and Project Intake Form. If funding is desired for water system improvements, the City of Milton-Freewater will need to schedule a One-Stop Meeting and submit a Project Intake Form as described earlier in this chapter. As stated above, OECDD evaluates a project based on information presented at the One-Stop Meeting and on the Intake Form to determine the best funding program suited to the project. OECDD then invites a City to submit a funding application to the particular funding program identified by OECDD.

LOCAL FINANCING OPTIONS

Regardless of the ultimate project scope and agency from which funding is obtained, the City may need to develop authorization to incur debt (i.e., bonding) for the needed project improvements. The need to develop authorization to incur debt depends on funding agency requirements and provisions in the City Charter. Bonding by the City is not required by most state funding programs. However, if a bond election is required, there are generally two options the City may use for its bonding authority: general obligation bonds and revenue bonds. General obligation bonds require a vote of the people to give the City the authority to repay the debt service through tax assessments, water revenues, or a combination of both. The taxing authority of the City provides the guarantee for the debt. Revenue bonds are financed through revenues of the water system. Authority to issue revenue bonds can come in two forms. One would be through a local bond election similar to that needed to sell a general obligation bond, and the second would be through Council action authorizing the sale of revenue bonds, if the City charter allows. If citizens do not object to the bonding authority resolution during a 60-day remonstrance period, the City would have authority to sell these revenue bonds.

PROJECT IMPLEMENTATION

The following action items and implementation steps need to be made by the City of Milton-Freewater if they desire to implement a water system improvements project.

The steps outlined are general in nature and include the major steps that need to be undertaken.

Action Items

1. The City will need to formally adopt this Water System Master Plan.

2. The City needs to select the scope of a water system improvements project.

3. If funding assistance is needed to fund the improvements, the City needs to schedule and attend a One-Stop Meeting with OECDD, complete the Project Intake Form, and submit the form to OECDD to initiate funding discussions.

4. The City will need to hold public information meetings to inform its citizens of the needs and scope of the project, to answer questions, and to generate support for a local bond issue, if required.

5. The City will need to acquire any required easements and property for the new water facilities, depending on the location of these improvements.

6. The City will need to prepare funding applications for the water system improvements project, if outside funding is pursued, and submit them to the appropriate funding agencies.

PROPOSED PROJECT IMPLEMENTATION PLAN

Should the City wish to proceed with a water system improvements project, the following Implementation Plan outlines the key steps the City would need to undertake to proceed with project implementation. It is important to note that it typically takes nearly two years or more from the date the City decides to proceed with an improvements project until it is completed and serving the community.

	ITEM	COMPLETION DATE
1.	Schedule and attend a One-Stop Meeting with OECDD.	Spring 2009
2.	Complete and submit the Project Intake Form to OECDD.	Spring 2009
3.	Initiate funding discussions with funding agencies.	Spring 2009
4.	Submit funding applications to appropriate funding agencies.	Spring - Summer 2009
5.	Obtain local bonding authority, if required.	Fall 2009
6.	Finalize project funding.	Fall 2009

ITEM		COMPLETION DATE
7.	Design system improvements.	Winter 2009-10
8.	Construct system improvements.	Spring - Summer 2010

The key to implementing part or all of the water system improvements outlined in Chapter 6, as a single project, is the ability of the City to fund the project themselves or acquire low-interest loan funding. The City will have to work closely with its citizens to inform them of the system needs and the necessity for increased water user costs. Depending on the scope of improvements, the City may need to plan on average user costs being in the range of approximately $35 to $40 per month to obtain the loan funds required to complete the improvements. Rates at these levels may result in the City becoming eligible for grant funds or special interest rates.

The City of Milton-Freewater has an excellent water system that operates efficiently. The City's existing multiple reservoirs and wells provide considerable redundancy in the water system. Water system improvements as outlined in this Water System Master Plan will help to improve the reliability and quality of the water system, which would help to continue to meet the needs of the City for many years to come.

Water Department Revenues

Fiscal Year	Services (User Fees)	Water Meter Sales (Installations)	System Development Charges	Merchandising Revenues	Interest Income	Miscellaneous Income	Total Revenues
2003-04	$902,065	$3,911	$10,440	$382	$2,086	$384	$919,268
2004-05	$920,411	$3,440	$7,175	$10,707	$3,714	$0	$945,447
2005-06	$960,996	$0	$6,280	$3,468	$5,335	$97	$976,176
2006-07	$1,033,422	$0	$6,565	$0	$5,305	$0	$1,045,292
2007-08	$961,705	$0	$125,908	$0	$4,847	$0	$1,092,455
2008-09*	$1,094,700	$5,000	$121,000	$1,400	$0	$6,000	$1,228,100

Notes: *2008-09 revenue is projected per the City's adopted budget.

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CITY OF
MILTON-FREEWATER, OREGON
WATER SYSTEM MASTER PLAN

WATER DEPARTMENT REVENUES

TABLE
7-1

Water Department Expenditures

Actual Data From the City's Audit Reports

Fiscal Year	Personnel Cost	Operating Cost	Capital Outlay	Total O,M,&R Cost	Existing Debt Service	Total O,M,&R and Existing Debt Cost	Inter-Fund Transfers Out (Net)	Total Cost
2003-04	$110,676	$224,410	$32,193	$367,279	$183,706	$550,985	$371,742	$922,727
2004-05	$134,014	$224,707	$33,812	$392,533	$154,661	$547,194	$422,227	$969,421
2005-06	$174,313	$225,419	$4,809	$404,541	$184,731	$589,272	$368,527	$957,799
2006-07	$183,319	$231,732	$47,133	$462,184	$175,682	$637,866	$434,050	$1,071,916
2007-08	$201,391	$229,919	$12,812	$444,122	$181,787	$625,909	$447,860	$1,073,769
2008-09*	$231,952	$250,219	$87,860	$570,031	$182,155	$752,186	$444,149	$1,196,335

Notes: *2008-09 data derived from the City's budget.

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CITY OF
MILTON-FREEWATER, OREGON
WATER SYSTEM MASTER PLAN
WATER DEPARTMENT
EXPENDITURES

TABLE
7-2

Preliminary
Water Rate Analysis For Bonding Capacity
2009-10 Budget Year

Rates		Expenditures					
Average Monthly Cost[1]	Revenue[2]	Estimated O,M,&R Costs[3]	Existing Bond Payments	Interfund Transfers[4]	Revenue Available for Debt Service	Total Expenditures	Bonding Capacity[5]
$30	$1,047,960	$572,000	$183,000	$445,000	$0	$1,200,000	$0
$32	$1,117,824	$572,000	$183,000	$445,000	$0	$1,200,000	$0
$34	$1,187,688	$572,000	$183,000	$445,000	$0	$1,200,000	$0
$36	$1,257,552	$572,000	$183,000	$445,000	$57,552	$1,200,000	$717,606
$38	$1,327,416	$572,000	$183,000	$445,000	$127,416	$1,200,000	$1,588,728
$40	$1,397,280	$572,000	$183,000	$445,000	$197,280	$1,200,000	$2,459,850
$42	$1,467,144	$572,000	$183,000	$445,000	$267,144	$1,200,000	$3,330,973
$44	$1,537,008	$572,000	$183,000	$445,000	$337,008	$1,200,000	$4,202,095

[1] The current base rate of $17.22 for 5,000 gallons is attributable for approximately 57 percent of the City's revenue. Additional water use and commercial and industrial rates cause the average monthly cost to increase to approximately $30.00 per month.

[2] Assumes 2,911 water system accounts.

[3] Projected budget year 2009-10 O,M,&R cost including personnel, operating, and capital outlay expenditures.

[4] Interfund transfers are the average amount from 2006-07 through 2008-09 budget.

[5] Assumed loan funding at 5 percent for 20 years. Values are rounded to the nearest $1,000.

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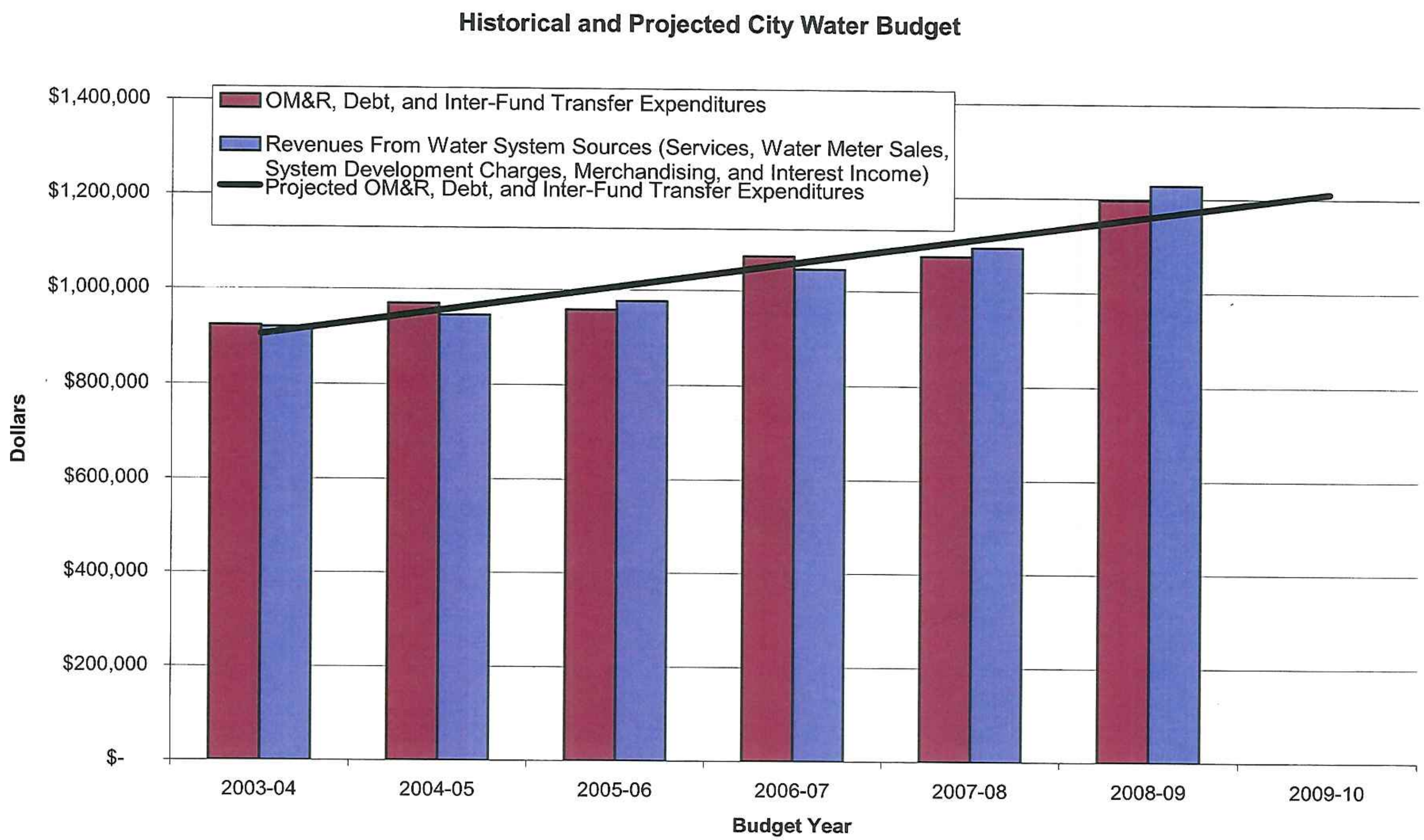
CITY OF
MILTON-FREEWATER, OREGON
WATER SYSTEM MASTER PLAN
PRELIMINARY WATER RATE ANALYSIS
FOR BONDING CAPACITY

TABLE
7-3



Notes:
2008-09 data are derived from the City's Budget.

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CITY OF
MILTON-FREEWATER, OREGON
WATER SYSTEM MASTER PLAN
HISTORICAL AND PROJECTED
CITY WATER BUDGET

FIGURE
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APPENDICES

APPENDIX A

Drinking Water Program
Water Quality Testing Summary

Oregon Department of Human Services

Drinking Water Program

Water System #: OR4100522
MILTON-FREEWATER, CITY OF
Certification Level Required

Distribution: 2
Treatment: None
Filtration: None

Licensed Operators and their certification levels

Cert Number	Name	Distribution Level	Is DRC* Distribution	Treatment Level	Is DRC* Treatment	Filtration Endorsement	License Expires
D-1790	Scott D. Amon	1					12/31/2008
D-1827	Steve P. Birdwell, Sr.	2					12/31/2008
T-1845 D-1845	David L. Bradshaw	2	DRC Dist	2			12/31/2008 12/31/2008
D-6509	Murdeth S. Brannan						12/31/2006
D-6511	Robin W. Burrowes						12/31/2006
D-6558	David G. Robertson	1					12/31/2009
D-6559	Emilio A. Sandoval	1					12/31/2009
D-6275	Ken A. Weis	2					12/31/2009
D-6560	Richard L. Worden	1					12/31/2009

*Direct Resposible Charge
**Contract Operator
***Only Operators with a current certification will appear.

Distribution Grade 2

EPA Rule	Requirements
333-061-0235 OPERATOR REQUIREMENTS LEVELS 1-4	HS/GED and 3 years experience, *OR* HS/GED and 1 year relevant post-high school education and 2 years experience

For further information on this public water system click on the area of interest below.

System Info :: Report for Lenders :: Alerts :: Violations :: Enforcements :: Contacts :: Site Visits :: Public Notice
Coliform Summary :: Coliform Results :: Coliform Results Archives (pre 2002) :: Sampling Schedule for Coliform
Chemical Group Summary :: Latest Chemical Results :: Chemical Detections :: Sampling Schedules for Chemicals
Single Analyte Results For a System :: Lead & Copper :: Corrosion Control(LCR) :: SWTR :: Nitrates :: Arsenic
DBPs :: TOC & Alkalinity :: DBP/TOC/Bromate/Chlorine Monitoring :: Radionuclides :: FANLs :: MRDL :: Plan Review

Information by county:
Inventory :: Surface Water Systems :: Water System Surveys :: Alerts :: Violations :: Open Enforcements :: Cross Connection ASRs

Inventory List for all Oregon Drinking Water Systems in Excel or printable screen format
SNC Reports for Oregon Drinking Water Systems

Oregon Department of Human Services

Drinking Water Program

OR41 00522 **MILTON-FREEWATER, CITY OF** **Classification:** COMMUNITY

Contact: DAVE BRADSHAW PO BOX 6 MILTON-FREEWATER, OR 97862	**Phone:** 541-938-8272 **County:** UMATILLA **Activity Status:** ACTIVE -- History
Population: 6,500	**Number of Connections:** 2,400
Operating Period: January 1 to December 31	**Regulating Agency:** REGION 1
Certified Operator(s)	**Owner Type:** LOCAL GOVERNMENT
Required: Y	**Licensed By:** N/A
Distribution class: 2	**Approved Drinking Water Protection Plan:** No
Treatment class: None	**Source Water Assessment:** Yes
Filtration Endorsement Required: No	**Last System Survey Date:** Apr 20, 2004

Sources

ID	Facility Name Well Logs	Activity Status	Availability	Source Type	Sampling Point?
EP-A	**EP FOR WELLFIELD (WELLS #1 & #2)**	**A**		**GW**	**Yes**
SRC-AA	WELL #1	A	permanent	GW	Yes
SRC-AB	WELL #2	A	permanent	GW	Yes
EP-B	**EP FOR WELLFIELD (WELLS #3,#5 & #6)**	**A**		**GW**	**Yes**
SRC-BA	WELL #3	A	permanent	GW	Yes
SRC-BB	WELL #5	A	permanent	GW	Yes
SRC-BC	WELL #6	A	permanent	GW	Yes
EP-C	**EP FOR WELL #8**	**A**		**GW**	**Yes**
SRC-CA	WELL #8 - COUSE CREEK ROAD	A	permanent	GW	Yes
EP-D	**EP FOR WELL #9**	**A**		**GW**	**Yes**
SRC-DA	WELL #9	A	permanent	GW	Yes

Treatment

State ID	Facility Name	Treatment Process	Treatment Objective
WTP-A	TP FOR WELLFIELD (WELLS #1 & #2)	RESID. MAINT. HYPOCHLORINATION	OTHER
WTP-B	TP FOR WELLFIELD (WELLS #3,#5 & #6)	RESID. MAINT. HYPOCHLORINATION	OTHER
WTP-C	TP FOR WELL #8	RESID. MAINT. HYPOCHLORINATION	OTHER
WTP-D	TP FOR WELL#9	RESID. MAINT. HYPOCHLORINATION	OTHER

Consumer Confidence Reports

For Year	Date Received	Date Certified
2007	Mar 24, 2008	Mar 24, 2008
2006	Apr 02, 2007	Apr 02, 2007
2005	Apr 10, 2006	Apr 03, 2006

2004	Jul 29, 2005	Jul 26, 2005

Cross Connection Annual Summary Reports

Ordinance Received	Ordinance Status	ASR Received
Yes	Final	2007
		2006
		2005

For further information on this public water system click on the area of interest below.

System Info :: Report for Lenders :: Alerts :: Violations :: Enforcements :: Contacts :: Site Visits :: Public Notice
Coliform Summary :: Coliform Results :: Coliform Results Archives (pre 2002) :: Sampling Schedule for Coliform
Chemical Group Summary :: Latest Chemical Results :: Chemical Detections :: Sampling Schedules for Chemicals
Single Analyte Results For a System :: Lead & Copper :: Corrosion Control(LCR) :: SWTR :: Nitrates :: Arsenic
DBPs :: TOC & Alkalinity :: DBP/TOC/Bromate/Chlorine Monitoring :: Radionuclides :: FANLs :: MRDL :: Plan Review

Information by county:
Inventory :: Surface Water Systems :: Water System Surveys :: Alerts :: Violations :: Open Enforcements :: Cross Connection ASRs

Inventory List for all Oregon Drinking Water Systems in Excel or printable screen format
SNC Reports for Oregon Drinking Water Systems

Oregon Department of Human Services

Drinking Water Program

PWS ID: 00522 ---- MILTON-FREEWATER, CITY OF

Group Abbreviations:	(ARS = Arsenic, DBP = Disinfection By Products, IOC = Inorganic Chemical, LCR = Lead/Copper, NO3 = Nitrate, OC = Organic Chemical SOC = Synthetic Organic Chemical, RAD = Radionuclides, TCR = Coliform, VOC = Volatile Organic Chemical, RL = SWTR)
Note:	Violations are displayed for the last 5 years only.

Violation History

ID	Monitoring Period Begin	Monitoring Period End	Facility ID	Group	Violation: Type - Count	Hide	Enforcement Action	Enforcement Date
32214	Apr 01, 2008	Apr 30, 2008		TCR	Routine Coliform: did not Report Enough - 1			
32162	Jul 01, 2007	Jul 31, 2007		TCR	Routine Coliform: did not Report Enough - 1			
32161	Jan 01, 2005	Dec 31, 2005	EP-B	NO3	Chemical Late/Nonreporting - 1		ST COMPLIANCE ACHIEVED	Nov 30, 2006
32184	Jan 01, 2005	Dec 31, 2007		ARS	Chemical Late/Nonreporting - 1			
32213	Jan 01, 2005	Dec 31, 2007	EP-B	SOC	Chemical Late/Nonreporting - 29	Show analytes		
32237	Jan 01, 2005	Dec 31, 2007	EP-B	VOC	Chemical Late/Nonreporting - 21	Show analytes		
32157	Jan 01, 2004	Dec 31, 2004	EP-C	NO3	Chemical Late/Nonreporting - 1		RETURNED TO COMPLIANCE	Jul 26, 2006
32157	Jan 01, 2004	Dec 31, 2004	EP-C	NO3	Chemical Late/Nonreporting - 1		ST COMPLIANCE ACHIEVED	Nov 30, 2006
32156	Jan 01, 2002	Dec 31, 2004	EP-A	SOC	Chemical Late/Nonreporting - 29	Show analytes	RETURNED TO COMPLIANCE	Jul 26, 2006

For all compliance errors please phone Chuck Michael, DWP Compliance Specialist, at 971-673-0405

For further information on this public water system click on the area of interest below.

System Info :: Report for Lenders :: Alerts :: Violations :: Enforcements :: Contacts :: Site Visits :: Public Notice
Coliform Summary :: Coliform Results :: Coliform Results Archives (pre 2002) :: Sampling Schedule for Coliform
Chemical Group Summary :: Latest Chemical Results :: Chemical Detections :: Sampling Schedules for Chemicals
Single Analyte Results For a System :: Lead & Copper :: Corrosion Control(LCR) :: SWTR :: Nitrates :: Arsenic
DBPs :: TOC & Alkalinity :: DBP/TOC/Bromate/Chlorine Monitoring :: Radionuclides :: FANLs :: MRDL :: Plan Review

Information by county:
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Inventory List for all Oregon Drinking Water Systems in Excel or printable screen format
SNC Reports for Oregon Drinking Water Systems

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Click here for Coliform fact sheet :: Spreadsheet :: MRDL Summary

PWS ID: **00522 ---- MILTON-FREEWATER, CITY OF**

Recent Coliform Test Results (SDWIS database)

Sample Date	# Samples	Type	Coliform Type	Results ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Dec 02, 2008	1	RT	Total	Absent--081203K2		N/A	0.07	Dec 10, 2008
Dec 02, 2008	1	RT	Total	Absent--081203K1		N/A	0.06	Dec 10, 2008
Nov 24, 2008	1	RT	Total	Absent--081125H2		N/A	0.17	Dec 03, 2008
Nov 24, 2008	1	RT	Total	Absent--081125H1		N/A	0.15	Dec 03, 2008
Nov 18, 2008	1	RT	Total	Absent--081119E2		N/A	0.12	Nov 28, 2008
Nov 18, 2008	1	RT	Total	Absent--081119E1		N/A	0.13	Nov 28, 2008
Nov 12, 2008	1	RT	Total	Absent--081113D2		N/A	0.12	Nov 21, 2008
Nov 12, 2008	1	RT	Total	Absent--081113D1		N/A	0.09	Nov 21, 2008
Nov 04, 2008	1	RT	Total	Absent--081105N3		N/A	0.07	Nov 10, 2008
Nov 04, 2008	1	RT	Total	Absent--081105N2		N/A	0.07	Nov 10, 2008
Oct 28, 2008	1	RT	Total	Absent--081029F2		N/A	0.20	Nov 07, 2008
Oct 28, 2008	1	RT	Total	Absent--081029F1		N/A	0.10	Nov 07, 2008
Oct 21, 2008	1	RT	Total	Absent--081022D2L		N/A	0.31	Oct 27, 2008
Oct 21, 2008	1	RT	Total	Absent--081022D1L		N/A	0.27	Oct 27, 2008
Oct 07, 2008	1	RT	Total	Absent--081008J2L		N/A	0.37	Oct 14, 2008
Oct 07, 2008	1	RT	Total	Absent--081008J1L		N/A	0.33	Oct 14, 2008
Oct 01, 2008	1	RT	Total	Absent--081002H2		N/A	0.23	Oct 06, 2008
Oct 01, 2008	1	RT	Total	Absent--081002H1		N/A	0.26	Oct 06, 2008
Sep 23, 2008	1	RT	Total	Absent--080923I2		N/A	0.31	Oct 06, 2008
Sep 23, 2008	1	RT	Total	Absent--080923I1		N/A	0.32	Oct 06, 2008

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Sep 16, 2008	1	RT	Total	Absent--080917IL		N/A	0.03	Sep 24, 2008
Sep 16, 2008	1	RT	Total	Absent--080917I2		N/A	0.06	Sep 24, 2008
Sep 09, 2008	1	RT	Total	Absent--080910H1		N/A	0.23	Sep 24, 2008
Sep 09, 2008	1	RT	Total	Absent--080910H2		N/A	0.10	Sep 24, 2008
Sep 03, 2008	1	RT	Total	Absent--080904K1		N/A	0.24	Sep 11, 2008
Sep 03, 2008	1	RT	Total	Absent--080904K2		N/A	0.18	Sep 11, 2008
Aug 26, 2008	1	RT	Total	Absent--080827I2		N/A	0.88	Sep 05, 2008
Aug 26, 2008	1	RT	Total	Absent--080827I1		N/A	0.55	Sep 05, 2008
Aug 19, 2008	1	RT	Total	Absent--080820F2		N/A	0.24	Aug 28, 2008
Aug 19, 2008	1	RT	Total	Absent--080820F1		N/A	0.25	Aug 28, 2008

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Aug 14, 2008	1	RT	Total	Absent--081015J2		N/A	0.18	Oct 23, 2008
Aug 14, 2008	1	RT	Total	Absent--081015J1		N/A	0.12	Oct 23, 2008
Aug 13, 2008	1	RT	Total	Absent--080814H2		N/A	0.10	Aug 28, 2008
Aug 13, 2008	1	RT	Total	Absent--080814H1		N/A	0.02	Aug 28, 2008
Aug 05, 2008	1	RT	Total	Absent--080806K3		N/A	0.22	Aug 14, 2008
Aug 05, 2008	1	RT	Total	Absent--080806K2		N/A	0.26	Aug 14, 2008
Jul 29, 2008	1	RT	Total	Absent--A80730B1		HOSE BIB	0.17	Aug 05, 2008
Jul 29, 2008	1	RT	Total	Absent--A80730B4		HOSE BIB	0.27	Aug 05, 2008
Jul 29, 2008	1	RT	Total	Absent--A80730B3		HOSE BIB	0.33	Aug 05, 2008
Jul 29, 2008	1	RT	Total	Absent--A80730B2		HOSE BIB	0.10	Aug 05, 2008
Sample Date	**# Samples**	**Coliform Type**	**Type**	**Results--ID**	**Repeat of Sample ID**	**Sample Site**	**Cl Residual**	**Receive Date**
Jul 09, 2008	1	RT	Total	Absent--MO080710PU131		N/A	0.37	Aug 06, 2008
Jul 09, 2008	1	RT	Total	Absent--MO080710PN123		N/A	0.22	Aug 06, 2008
Jul 01, 2008	1	RT	Total	Absent--MO080702PP329		N/A	0.19	Jul 24, 2008
Jul 01, 2008	1	RT	Total	Absent--MO080702PP328		N/A	0.19	Jul 24, 2008
Jun 25, 2008	1	RT	Total	Absent--MO080626PF212		N/A	0.05	Jul 07, 2008
Jun 25, 2008	1	RT	Total	Absent--MO080626PF211		N/A	0.43	Jul 07, 2008
Jun 18, 2008	1	RT	Total	Absent--MO080619PE27		N/A	0.08	Jul 02, 2008
Jun 18, 2008	1	RT	Total	Absent--MO080619PE28		N/A	0.08	Jul 02, 2008
Jun 11, 2008	1	RT	Total	Absent--MO080612PD35		N/A	0.28	Jul 02, 2008
Jun 11, 2008	1	RT	Total	Absent--MO080612PD34		N/A	0.17	Jul 02, 2008
Jun 04, 2008	1	RT	Total	Absent--MO080605PK316		N/A	0.39	Jul 02, 2008
Jun 04, 2008	1	RT	Total	Absent--MO080605PK315		N/A	0.33	Jul 02, 2008
May 28, 2008	1	RT	Total	Absent--MO080529PE26		N/A	0.22	Jun 05, 2008
May 28, 2008	1	RT	Total	Absent--MO080529PE25		N/A	0.24	Jun 05, 2008
May 21, 2008	1	RT	Total	Absent--MO080522PB22		N/A	0.13	Jun 02, 2008
May 21, 2008	1	RT	Total	Absent--MO080522PB23		N/A	0.07	Jun 02, 2008
May 14, 2008	1	RT	Total	Absent--MO080515PI212		N/A	0.05	May 27, 2008
May 14, 2008	1	RT	Total	Absent--MO080515PI211		N/A	0.22	May 27, 2008
May 07, 2008	1	RT	Total	Absent--MO080508PF48		N/A	1.05	May 27, 2008
May 07, 2008	1	RT	Total	Absent--MO080508PF47		N/A	0.73	May 27, 2008
Sample Date	**# Samples**	**Coliform Type**	**Type**	**Results--ID**	**Repeat of Sample ID**	**Sample Site**	**Cl Residual**	**Receive Date**
Apr 22, 2008	1	RT	Total	Absent--M0080423PH213		N/A	0.26	May 01, 2008
Apr 22, 2008	1	RT	Total	Absent--M0080423PH212		N/A	0.20	May 01, 2008
Apr 16, 2008	1	RT	Total	Absent--M0080417PB23		N/A	0.13	May 01, 2008
Apr 16, 2008	1	RT	Total	Absent--M0080417PB22		N/A	0.25	May 01, 2008
Apr 09, 2008	1	RT	Total	Absent--M0080410PE28		N/A	0.16	May 01, 2008
Apr 09, 2008	1	RT	Total	Absent--M0080410PE27		N/A	0.10	May 01, 2008

Mar 25, 2008	1	RT	Total	Absent--M0080326PI217		N/A	0.11	Mar 31, 2008
Mar 25, 2008	1	RT	Total	Absent--M0080326PI216		N/A	0.04	Mar 31, 2008
Mar 19, 2008	1	RT	Total	Absent--M0080320PE27		N/A	0.06	Mar 31, 2008
Mar 19, 2008	1	RT	Total	Absent--M0080320PE26		N/A	0.20	Mar 31, 2008
Mar 11, 2008	1	RT	Total	Absent--M0080312PJ218		N/A	0.35	Mar 17, 2008
Mar 11, 2008	1	RT	Total	Absent--M0080312PJ217		N/A	0.36	Mar 17, 2008
Mar 05, 2008	1	RT	Total	Absent--M0080306PD48		N/A	0.04	Mar 10, 2008
Mar 05, 2008	1	RT	Total	Absent--M0080306PD49		N/A	0.27	Mar 10, 2008
Feb 27, 2008	1	RT	Total	Absent--M0080228PB22		N/A	0.22	Mar 03, 2008
Feb 27, 2008	1	RT	Total	Absent--M0080228PB23		N/A	0.19	Mar 03, 2008
Feb 20, 2008	1	RT	Total	Absent--M0080221PA21		N/A	0.28	Feb 25, 2008
Feb 20, 2008	1	RT	Total	Absent--M0080221PA22		N/A	0.27	Feb 25, 2008
Feb 13, 2008	1	RT	Total	Absent--M0080214PE26		N/A	0.04	Feb 19, 2008
Feb 13, 2008	1	RT	Total	Absent--M0080214PE27		N/A	0.22	Feb 19, 2008

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Feb 06, 2008	1	RT	Total	Absent--M0080207PE49		N/A	0.19	Feb 19, 2008
Feb 06, 2008	1	RT	Total	Absent--M0080207PE410		N/A	0.03	Feb 19, 2008
Jan 30, 2008	1	RT	Total	Absent--M0080131PE26		N/A	0.03	Feb 04, 2008
Jan 30, 2008	1	RT	Total	Absent--M0080131PE27		N/A	0.05	Feb 04, 2008
Jan 22, 2008	1	RT	Total	Absent--M0080123PH216		N/A	0.30	Jan 28, 2008
Jan 22, 2008	1	RT	Total	Absent--M0080123PH215		N/A	0.23	Jan 28, 2008
Jan 15, 2008	1	RT	Total	Absent--M0080116PG28		N/A	0.10	Jan 22, 2008
Jan 15, 2008	1	RT	Total	Absent--M0080116PG29		N/A	0.10	Jan 22, 2008
Jan 08, 2008	1	RT	Total	Absent--M0080109PH411		N/A	0.45	Jan 14, 2008
Jan 08, 2008	1	RT	Total	Absent--M0080109PH410		N/A	0.44	Jan 14, 2008
Jan 02, 2008	1	RT	Total	Absent--M0080103PF217		N/A	0.05	Jan 09, 2008
Jan 02, 2008	1	RT	Total	Absent--M0080103PF216		N/A	0.07	Jan 09, 2008
Dec 26, 2007	1	RT	Total	Absent--M0071227PB22		N/A	0.41	Dec 31, 2007
Dec 26, 2007	1	RT	Total	Absent--M0071227PB23		N/A	0.45	Dec 31, 2007
Dec 19, 2007	1	RT	Total	Absent--M0071220PC23		N/A	0.10	Dec 26, 2007
Dec 19, 2007	1	RT	Total	Absent--M0071220PC24		N/A	0.31	Dec 26, 2007
Dec 11, 2007	1	RT	Total	Absent--M0071212PE26		N/A	0.28	Dec 17, 2007
Dec 11, 2007	1	RT	Total	Absent--M0071212PE25		N/A	0.13	Dec 17, 2007
Dec 05, 2007	1	RT	Total	Absent--M0071206PD47		N/A	0.16	Dec 10, 2007
Dec 05, 2007	1	RT	Total	Absent--M0071206PD46		N/A	0.15	Dec 10, 2007

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Nov 28, 2007	1	RT	Total	Absent--M0071129PD28		N/A	0.18	Dec 03, 2007
Nov 28, 2007	1	RT	Total	Absent--M0071129PD27		N/A	0.02	Dec 03, 2007

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Nov 19, 2007	1	RT	Total	Absent--M0071120PL218		N/A	0.17	Nov 23, 2007
Nov 19, 2007	1	RT	Total	Absent--M0071120PL217		N/A	0.16	Nov 23, 2007
Nov 14, 2007	1	RT	Total	Absent--M00711115PL219		N/A	0.13	Nov 21, 2007
Nov 14, 2007	1	RT	Total	Absent--M0071115PL220		N/A	0.25	Nov 21, 2007
Nov 08, 2007	1	RT	Total	Absent--M0071109PC44		N/A	0.22	Nov 15, 2007
Nov 08, 2007	1	RT	Total	Absent--M0071109PC43		N/A	0.20	Nov 15, 2007
Oct 31, 2007	1	RT	Total	Absent--M0071101PG216		N/A	0.17	Nov 05, 2007
Oct 31, 2007	1	RT	Total	Absent--M0071101PG215		N/A	0.01	Nov 05, 2007
Oct 24, 2007	1	RT	Total	Absent--M0071025PD25		N/A	0.12	Oct 31, 2007
Oct 24, 2007	1	RT	Total	Absent--M0071025PD24		N/A	0.10	Oct 31, 2007
Oct 17, 2007	1	RT	Total	Absent--M0071018PE28		N/A	0.43	Oct 22, 2007
Oct 17, 2007	1	RT	Total	Absent--M0071018PE27		N/A	0.48	Oct 22, 2007
Oct 10, 2007	1	RT	Total	Absent--M0071011PG28		N/A	0.12	Oct 15, 2007
Oct 10, 2007	1	RT	Total	Absent--M0071011PG27		N/A	0.10	Oct 15, 2007
Oct 03, 2007	1	RT	Total	Absent--M0071004PE8		N/A	0.08	Oct 09, 2007
Oct 03, 2007	1	RT	Total	Absent--M0071004PG49		N/A	0.62	Oct 09, 2007
Sep 19, 2007	1	RT	Total	Absent--M0070920PG314		N/A	0.33	Sep 24, 2007
Sep 19, 2007	1	RT	Total	Absent--M0070920PG313		N/A	0.01	Sep 24, 2007
Sep 19, 2007	1	RT	Total	Absent--M0070920PG312		N/A	0.38	Sep 24, 2007
Sep 12, 2007	1	RT	Total	Absent--M0070914PB23		N/A	0.29	Sep 19, 2007
Sep 12, 2007	1	RT	Total	Absent--M0070914PB22		N/A	0.23	Sep 19, 2007
Sep 05, 2007	1	RT	Total	Absent--M0070906PIL417		N/A	0.09	Sep 10, 2007
Sep 05, 2007	1	RT	Total	Absent--M0070906PIL416		N/A	0.41	Sep 10, 2007
Aug 29, 2007	1	RT	Total	Absent--M0070830PE25		N/A	0.25	Sep 06, 2007
Aug 29, 2007	1	RT	Total	Absent--M0070830PE26		N/A	0.22	Sep 06, 2007
Aug 22, 2007	1	RT	Total	Absent--M0070823PG29		N/A	0.40	Aug 27, 2007
Aug 22, 2007	1	RT	Total	Absent--M0070823PG210		N/A	0.38	Aug 27, 2007
Aug 15, 2007	1	RT	Total	Absent--M0070816PH28		N/A	0.25	Aug 20, 2007
Aug 15, 2007	1	RT	Total	Absent--M0070816PH27		N/A	0.20	Aug 20, 2007
Aug 08, 2007	1	RT	Total	Absent--M0070809PF411		N/A	0.28	Aug 13, 2007
Aug 08, 2007	1	RT	Total	Absent--M0070809PF410		N/A	0.15	Aug 13, 2007
Aug 01, 2007	1	RT	Total	Absent--M0070802PH219		N/A	0.25	Aug 06, 2007
Aug 01, 2007	1	RT	Total	Absent--M0070802PH218		N/A	0.20	Aug 06, 2007
Jul 25, 2007	1	RT	Total	Absent--M0070726PB23		N/A	0.19	Aug 01, 2007
Jul 25, 2007	1	RT	Total	Absent--M0070726PB22		N/A	0.41	Aug 01, 2007
Jul 18, 2007	1	RT	Total	Absent--M0070719PD26		N/A	0.25	Aug 01, 2007
Jul 18, 2007	1	RT	Total	Absent--M0070719PD25		N/A	0.20	Aug 01, 2007
Jul 11, 2007	1	RT	Total	Absent--M0070712PF213		N/A	0.23	Jul 16, 2007

Repeat

Sample Date	# Samples	Coliform Type	Type	Results--ID	of Sample ID	Sample Site	Cl Residual	Receive Date
Jul 11, 2007	1	RT	Total	Absent--M0070712PF212		N/A	0.14	Jul 16, 2007
Jun 27, 2007	1	RT	Total	Absent--M0070628PH310		N/A	0.25	Jul 05, 2007
Jun 27, 2007	1	RT	Total	Absent--M0070628PH311		N/A	0.28	Jul 05, 2007
Jun 19, 2007	1	RT	Total	Absent--M0070620PH210		N/A	0.08	Jun 25, 2007
Jun 19, 2007	1	RT	Total	Absent--M0070620PH29		N/A	0.20	Jun 25, 2007
Jun 13, 2007	1	RT	Total	Absent--M0070614PF213		N/A	0.06	Jun 18, 2007
Jun 13, 2007	1	RT	Total	Absent--M0070614PF212		N/A	0.01	Jun 18, 2007
Jun 06, 2007	1	RT	Total	Absent--M0070607PI513		N/A	0.35	Jun 11, 2007
Jun 06, 2007	1	RT	Total	Absent--M0070607PI512		N/A	0.95	Jun 11, 2007
May 30, 2007	1	RT	Total	Absent--M0070531PD27		N/A	0.16	Jun 04, 2007
May 30, 2007	1	RT	Total	Absent--M0070531PD26		N/A	0.10	Jun 04, 2007
May 23, 2007	1	RT	Total	Absent--M0070524PJ212		N/A	0.05	Jun 04, 2007
May 23, 2007	1	RT	Total	Absent--M0070524PJ211		N/A	0.11	Jun 04, 2007
May 16, 2007	1	RT	Total	Absent--M0070517PH217		N/A	0.17	May 21, 2007
May 16, 2007	1	RT	Total	Absent--M0070517PH216		N/A	0.18	May 21, 2007
May 09, 2007	1	RT	Total	Absent--M0070510PG210		N/A	0.24	May 14, 2007
May 09, 2007	1	RT	Total	Absent--M0070510PG29		N/A	0.29	May 14, 2007
May 02, 2007	1	RT	Total	Absent--M0070503PG411		N/A	0.15	May 07, 2007
May 02, 2007	1	RT	Total	Absent--M0070503PG412		N/A	0.14	May 07, 2007
Apr 25, 2007	1	RT	Total	Absent--M0070426PF27		N/A	0.14	May 02, 2007
Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Apr 25, 2007	1	RT	Total	Absent--M0070426PF26		N/A	0.14	May 02, 2007
Apr 17, 2007	1	RT	Total	Absent--M0070418PI211		N/A	0.16	Apr 23, 2007
Apr 17, 2007	1	RT	Total	Absent--M0070418PI210		N/A	0.22	Apr 23, 2007
Apr 11, 2007	1	RT	Total	Absent--M0070412PD25		N/A	0.19	Apr 16, 2007
Apr 11, 2007	1	RT	Total	Absent--M0070412PD24		N/A	0.22	Apr 16, 2007
Apr 04, 2007	1	RT	Total	Absent--M0070405PF48		N/A	0.15	Apr 09, 2007
Apr 04, 2007	1	RT	Total	Absent--M0070405PF47		N/A	0.15	Apr 09, 2007
Mar 27, 2007	1	RT	Total	Absent--M0070327PG38		N/A	0.48	Apr 02, 2007
Mar 27, 2007	1	RT	Total	Absent--M0070327PG37		N/A	0.68	Apr 02, 2007
Mar 21, 2007	1	RT	Total	Absent--M0070322PG210		N/A	0.22	Mar 26, 2007
Mar 21, 2007	1	RT	Total	Absent--M0070322PG29		N/A	0.19	Mar 26, 2007
Mar 14, 2007	1	RT	Total	Absent--M0070315PK212		N/A	0.31	Mar 19, 2007
Mar 14, 2007	1	RT	Total	Absent--M0070315PK211		N/A	0.26	Mar 19, 2007
Mar 07, 2007	1	RT	Total	Absent--M0070308PD45		N/A	0.14	Mar 14, 2007
Mar 07, 2007	1	RT	Total	Absent--M0070308PD44		N/A	0.13	Mar 14, 2007
Feb 28, 2007	1	RT	Total	Absent--M0070301PG29		N/A	0.25	Mar 05, 2007
Feb 28, 2007	1	RT	Total	Absent--M0070301PG28		N/A	0.22	Mar 05, 2007

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Feb 21, 2007	1	RT	Total	Absent--M0070222PE26		N/A	0.20	Feb 26, 2007
Feb 21, 2007	1	RT	Total	Absent--M0070222PE25		N/A	0.17	Feb 26, 2007
Feb 14, 2007	1	RT	Total	Absent--M0070215PF27		N/A	0.31	Feb 20, 2007
Feb 14, 2007	1	RT	Total	Absent--M0070215PF26		N/A	0.25	Feb 20, 2007
Feb 07, 2007	1	RT	Total	Absent--M0070208PE48		N/A	0.10	Feb 12, 2007
Feb 07, 2007	1	RT	Total	Absent--M0070208PE47		N/A	0.08	Feb 12, 2007
Jan 31, 2007	1	RT	Total	Absent--M0070201PC24		N/A	0.24	Feb 05, 2007
Jan 31, 2007	1	RT	Total	Absent--M0070201PC23		N/A	0.10	Feb 05, 2007
Jan 24, 2007	1	RT	Total	Absent--M0070125PE27		N/A	0.15	Jan 29, 2007
Jan 24, 2007	1	RT	Total	Absent--M0070125PE26		N/A	0.20	Jan 29, 2007
Jan 17, 2007	1	RT	Total	Absent--M0070118PC26		N/A	0.34	Jan 22, 2007
Jan 17, 2007	1	RT	Total	Absent--M0070118PC25		N/A	0.29	Jan 22, 2007
Jan 10, 2007	1	RT	Total	Absent--M0070111PF27		N/A	0.17	Jan 16, 2007
Jan 10, 2007	1	RT	Total	Absent--M0070111PF26		N/A	0.19	Jan 16, 2007
Jan 03, 2007	1	RT	Total	Absent--M0070104PG49		N/A	0.45	Jan 10, 2007
Jan 03, 2007	1	RT	Total	Absent--M0070104PG48		N/A	0.70	Jan 10, 2007
Dec 26, 2006	1	RT	Total	Absent--M0061227PD26		N/A	0.16	Jan 03, 2007
Dec 26, 2006	1	RT	Total	Absent--M0061227PD25		N/A	0.16	Jan 03, 2007
Dec 18, 2006	1	RT	Total	Absent--M0061219PE26		N/A	0.39	Dec 26, 2006
Dec 18, 2006	1	RT	Total	Absent--M0061219PE25		N/A	0.41	Dec 26, 2006
Dec 13, 2006	1	RT	Total	Absent--M0061214PH211		N/A	0.09	Dec 18, 2006
Dec 13, 2006	1	RT	Total	Absent--M0061214PH210		N/A	0.04	Dec 18, 2006
Dec 06, 2006	1	RT	Total	Absent--M0061207PF47		N/A	0.35	Dec 11, 2006

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Dec 06, 2006	1	RT	Total	Absent--M0061207PF46		N/A	0.39	Dec 11, 2006
Nov 29, 2006	1	RT	Total	Absent--M0061130PG210		N/A	0.13	Dec 04, 2006
Nov 29, 2006	1	RT	Total	Absent--M0061130PG29		N/A	0.15	Dec 04, 2006
Nov 20, 2006	1	RT	Total	Absent--M0061121PK216		N/A	0.30	Nov 30, 2006
Nov 20, 2006	1	RT	Total	Absent--M0061121PK215		N/A	0.26	Nov 30, 2006
Nov 15, 2006	1	RT	Total	Absent--M0061116PC24		N/A	0.26	Nov 20, 2006
Nov 15, 2006	1	RT	Total	Absent--M00061116PC23		N/A	0.24	Nov 20, 2006
Nov 07, 2006	1	RT	Total	Absent--M0061108PE25		N/A	0.13	Nov 10, 2006
Nov 07, 2006	1	RT	Total	Absent--M0061108PE26		N/A	0.39	Nov 13, 2006
Nov 01, 2006	1	RT	Total	Absent--M0061102PF411		N/A	0.14	Nov 06, 2006
Nov 01, 2006	1	RT	Total	Absent--M0061102PF410		N/A	0.04	Nov 06, 2006
Oct 25, 2006	1	RT	Total	Absent--M0061026PE25-2		N/A	0.04	Oct 30, 2006
Oct 25, 2006	1	RT	Total	Absent--M0061026PE25-1		N/A	0.04	Oct 30, 2006

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Oct 18, 2006	1	RT	Total	Absent--M0061019PG27-2		N/A	0.19	Oct 23, 2006
Oct 18, 2006	1	RT	Total	Absent--M0061019PG27-1		N/A	0.19	Oct 23, 2006
Oct 11, 2006	1	RT	Total	Absent--M0061012PF210-2		N/A	0.50	Oct 16, 2006
Oct 11, 2006	1	RT	Total	Absent--M0061012PF210-1		N/A	0.50	Oct 16, 2006
Oct 04, 2006	1	RT	Total	Absent--M0061005PF46-2		N/A	0.27	Oct 12, 2006
Oct 04, 2006	1	RT	Total	Absent--M0061005PF46-1		N/A	0.27	Oct 12, 2006
Sep 27, 2006	1	RT	Total	Absent--M0060928PC33-2		N/A	0.20	Oct 04, 2006
Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Sep 27, 2006	1	RT	Total	Absent--M0060928PC33-1		N/A	0.20	Oct 04, 2006
Sep 20, 2006	1	RT	Total	Absent--M0060921PE25-2		N/A	0.12	Sep 25, 2006
Sep 20, 2006	1	RT	Total	Absent--M0060921PE25-1		N/A	0.12	Sep 25, 2006
Sep 13, 2006	1	RT	Total	Absent--M0060914PE27-2		N/A	0.39	Sep 20, 2006
Sep 13, 2006	1	RT	Total	Absent--M0060914PE27-1		N/A	0.39	Sep 20, 2006
Sep 06, 2006	1	RT	Total	Absent--M0060907PF48-2		N/A	0.25	Sep 12, 2006
Sep 06, 2006	1	RT	Total	Absent--M0060907PF48-1		N/A	0.25	Sep 12, 2006
Aug 30, 2006	1	RT	Total	Absent--M0060831PC23-2		N/A	0.33	Sep 05, 2006
Aug 30, 2006	1	RT	Total	Absent--M0060831PC23-1		N/A	0.33	Sep 05, 2006
Aug 23, 2006	1	RT	Total	Absent--M0060824PA21-2		N/A	0.38	Aug 28, 2006
Aug 23, 2006	1	RT	Total	Absent--M0060824PA21-1		N/A	0.38	Aug 28, 2006
Aug 16, 2006	1	RT	Total	Absent--M0060817PE26-2		N/A	0.52	Aug 24, 2006
Aug 16, 2006	1	RT	Total	Absent--M0060817PE26-1		N/A	0.52	Aug 24, 2006
Aug 09, 2006	1	RT	Total	Absent--M0060810PE411-2		N/A	0.27	Aug 14, 2006
Aug 09, 2006	1	RT	Total	Absent--M0060810PE411-1		N/A	0.27	Aug 14, 2006
Aug 02, 2006	1	RT	Total	Absent--M0060803PD25-2		N/A	0.39	Aug 07, 2006
Aug 02, 2006	1	RT	Total	Absent--M0060803PD25-1		N/A	0.39	Aug 07, 2006
Jul 26, 2006	1	RT	Total	Absent--M0060727PF28-2		N/A	0.36	Aug 01, 2006
Jul 26, 2006	1	RT	Total	Absent--M0060727PF28-1		N/A	0.36	Aug 01, 2006
Jul 19, 2006	1	RT	Total	Absent--M0060720PB34-2		N/A	0.12	Jul 24, 2006
Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Jul 19, 2006	1	RT	Total	Absent--M0060720PB34-1		N/A	0.12	Jul 24, 2006
Jul 12, 2006	1	RT	Total	Absent--M0060713PJ421		N/A	0.01	Jul 17, 2006
Jul 06, 2006	1	RT	Total	Absent--M0060707PH211-2		N/A	0.04	Jul 17, 2006
Jul 06, 2006	1	RT	Total	Absent--M0060707PH211-1		N/A	0.04	Jul 17, 2006
Jun 28, 2006	1	RT	Total	Absent--M0060629PF28-2		N/A	0.14	Jul 03, 2006
Jun 28, 2006	1	RT	Total	Absent--M0060629PF28-1		N/A	0.14	Jul 03, 2006
Jun 22, 2006	1	RT	Total	Absent--M0060623PB22-2		N/A	0.24	Jul 03, 2006
Jun 22, 2006	1	RT	Total	Absent--M0060623PB22-1		N/A	0.24	Jul 03, 2006
Jun 14, 2006	1	RT	Total	Absent--M0060615PG28-2		N/A	0.26	Jun 19, 2006

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Jun 14, 2006	1	RT	Total	Absent--M0060615PG28-1		N/A	0.26	Jun 19, 2006
Jun 07, 2006	1	RT	Total	Absent--M0060608PD44-2		N/A	0.25	Jun 12, 2006
Jun 07, 2006	1	RT	Total	Absent--M0060608PD44-1		N/A	0.25	Jun 12, 2006
May 24, 2006	1	RT	Total	Absent--M0060525PC211-2		N/A	0.22	May 30, 2006
May 24, 2006	1	RT	Total	Absent--M0060525PC211-1		N/A	0.22	May 30, 2006
May 17, 2006	1	RT	Total	Absent--M0060518PE25-2		N/A	0.28	May 22, 2006
May 17, 2006	1	RT	Total	Absent--M0060518PE25-1		N/A	0.28	May 22, 2006
May 10, 2006	1	RT	Total	Absent--M0060511PH29-2		N/A	0.27	May 17, 2006
May 10, 2006	1	RT	Total	Absent--M0060511PH29-1		N/A	0.27	May 17, 2006
May 03, 2006	1	RT	Total	Absent--M0060504PD44-2		N/A	0.15	May 08, 2006
May 03, 2006	1	RT	Total	Absent--M0060504PD44-1		N/A	0.15	May 08, 2006
Apr 27, 2006	1	RT	Total	Absent--M0060428PF29-2		N/A	0.32	May 03, 2006
Apr 27, 2006	1	RT	Total	Absent--M0060428PF29-1		N/A	0.32	May 03, 2006
Apr 19, 2006	1	RT	Total	Absent--M0060420PD24-2		N/A	0.09	Apr 26, 2006
Apr 19, 2006	1	RT	Total	Absent--M0060420PD24-1		N/A	0.09	Apr 26, 2006
Apr 12, 2006	1	RT	Total	Absent--M0060413PH28-2		N/A	0.22	Apr 17, 2006
Apr 12, 2006	1	RT	Total	Absent--M0060413PH28-1		N/A	0.22	Apr 17, 2006
Apr 05, 2006	1	RT	Total	Absent--M0060406PH413		N/A	0.23	Apr 10, 2006
Mar 29, 2006	1	RT	Total	Absent--M0060330PB22-2		N/A	0.20	Apr 03, 2006
Mar 29, 2006	1	RT	Total	Absent--M0060330PB22-1		N/A	0.20	Apr 03, 2006
Mar 22, 2006	1	RT	Total	Absent--M0060323PD24-2		N/A	0.22	Mar 27, 2006
Mar 22, 2006	1	RT	Total	Absent--M0060323PD24-1		N/A	0.22	Mar 27, 2006
Mar 16, 2006	1	RT	Total	Absent--M0060317PD24-2		N/A	0.19	Mar 27, 2006
Mar 16, 2006	1	RT	Total	Absent--M0060317PD24-1		N/A	0.19	Mar 27, 2006
Mar 08, 2006	1	RT	Total	Absent--M0060309PE48		N/A	0.27	Mar 13, 2006
Mar 08, 2006	1	RT	Total	Absent--M0060309PE47		N/A	0.29	Mar 13, 2006
Feb 22, 2006	1	RT	Total	Absent--M0060223PE25-2		N/A	0.22	Mar 01, 2006
Feb 22, 2006	1	RT	Total	Absent--M0060223PE25-1		N/A	0.22	Mar 01, 2006
Feb 15, 2006	1	RT	Total	Absent--M0060216PH210-2		N/A	0.43	Feb 21, 2006
Feb 15, 2006	1	RT	Total	Absent--M0060216PH210-1		N/A	0.43	Feb 21, 2006
Feb 08, 2006	1	RT	Total	Absent--M0060209PG211-2		N/A	0.22	Feb 13, 2006
Feb 08, 2006	1	RT	Total	Absent--M0060209PG211-1		N/A	0.22	Feb 13, 2006
Feb 01, 2006	1	RT	Total	Absent--M0060202PE45-2		N/A	0.30	Feb 08, 2006
Feb 01, 2006	1	RT	Total	Absent--M0060202PE45-1		N/A	0.30	Feb 08, 2006
Jan 25, 2006	1	RT	Total	Absent--M0060126PD25-2		N/A	0.15	Jan 30, 2006
Jan 25, 2006	1	RT	Total	Absent--M0060126PD25-1		N/A	0.15	Jan 30, 2006

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Jan 18, 2006	1	RT	Total	Absent--M0060119PF48-2		N/A	0.22	Jan 23, 2006
Jan 18, 2006	1	RT	Total	Absent--M0060119PF48-1		N/A	0.22	Jan 23, 2006
Jan 11, 2006	1	RT	Total	Absent--M0060113PB22-2		N/A	0.25	Jan 23, 2006
Jan 11, 2006	1	RT	Total	Absent--M0060113PB22-1		N/A	0.25	Jan 23, 2006
Jan 04, 2006	1	RT	Total	Absent--M0060105PC24-2		N/A	0.27	Jan 09, 2006
Jan 04, 2006	1	RT	Total	Absent--M0060105PC24-1		N/A	0.27	Jan 09, 2006
Dec 28, 2005	1	RT	Total	Absent--M0051229PE28-2		N/A	0.04	Jan 03, 2006
Dec 28, 2005	1	RT	Total	Absent--M0051229PE28-1		N/A	0.04	Jan 03, 2006
Dec 20, 2005	1	RT	Total	Absent--M0051221PD24		N/A	0.12	Dec 27, 2005
Dec 14, 2005	1	RT	Total	Absent--M0051215PD54-2		N/A	0.08	Dec 19, 2005
Dec 14, 2005	1	RT	Total	Absent--M0051215PD54-1		N/A	0.08	Dec 19, 2005
Dec 07, 2005	1	RT	Total	Absent--M0051208PD46-2		N/A	0.17	Dec 12, 2005
Dec 07, 2005	1	RT	Total	Absent--M0051208PD46-1		N/A	0.17	Dec 12, 2005
Nov 30, 2005	1	RT	Total	Absent--M0051201PD25-2		N/A	0.17	Dec 12, 2005
Nov 30, 2005	1	RT	Total	Absent--M0051201PD25-1		N/A	0.17	Dec 12, 2005

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Nov 16, 2005	1	RT	Total	Absent--M0051117PC23-2		N/A	0.20	Nov 21, 2005
Nov 16, 2005	1	RT	Total	Absent--M0051117PC23-1		N/A	0.20	Nov 21, 2005
Nov 09, 2005	1	RT	Total	Absent--M0051110PD24-2		N/A	0.23	Nov 16, 2005
Nov 09, 2005	1	RT	Total	Absent--M0051110PD24-1		N/A	0.23	Nov 16, 2005
Nov 02, 2005	1	RT	Total	Absent--M0051103PC43-2		N/A	0.37	Nov 07, 2005
Nov 02, 2005	1	RT	Total	Absent--M0051103PC43-1		N/A	0.37	Nov 07, 2005
Oct 26, 2005	1	RT	Total	Absent--M0051027PC28-2		N/A	0.12	Oct 31, 2005
Oct 26, 2005	1	RT	Total	Absent--M0051027PC28-1		N/A	0.12	Oct 31, 2005
Oct 19, 2005	1	RT	Total	Absent--M0051020PC23-2		N/A	0.19	Oct 24, 2005
Oct 19, 2005	1	RT	Total	Absent--M0051020PC23-1		N/A	0.19	Oct 24, 2005
Oct 12, 2005	1	RT	Total	Absent--M0051013PE26		N/A	0.15	Oct 17, 2005
Oct 12, 2005	1	RT	Total	Absent--M0051013PE25		N/A	0.18	Oct 17, 2005
Oct 05, 2005	1	RT	Total	Absent--M0051006PG48-2		N/A	0.11	Oct 12, 2005
Oct 05, 2005	1	RT	Total	Absent--M0051006PG48-1		N/A	0.11	Oct 12, 2005
Sep 28, 2005	1	RT	Total	Absent--M0050929PD26-2		N/A	0.84	Oct 04, 2005
Sep 28, 2005	1	RT	Total	Absent--M0050929PD26-1		N/A	0.84	Oct 04, 2005
Sep 21, 2005	1	RT	Total	Absent--M0050922PF210-2		N/A	0.16	Sep 27, 2005
Sep 21, 2005	1	RT	Total	Absent--M0050922PF210-1		N/A	0.16	Sep 27, 2005
Sep 14, 2005	1	RT	Total	Absent--M0050915PE28-2		N/A	0.29	Sep 19, 2005
Sep 14, 2005	1	RT	Total	Absent--M0050915PE28-1		N/A	0.29	Sep 19, 2005

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Sep 07, 2005	1	RT	Total	Absent--M0050908PF47-2		N/A	0.19	Sep 12, 2005

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Sep 07, 2005	1	RT	Total	Absent--M0050908PF47-1		N/A	0.19	Sep 12, 2005
Aug 24, 2005	1	RT	Total	Absent--M0050825PE45-2		N/A	0.17	Aug 29, 2005
Aug 24, 2005	1	RT	Total	Absent--M0050825PE45-1		N/A	0.17	Aug 29, 2005
Aug 17, 2005	1	RT	Total	Absent--M0050818PC23-2		N/A	0.20	Aug 22, 2005
Aug 17, 2005	1	RT	Total	Absent--M0050818PC23-1		N/A	0.20	Aug 22, 2005
Aug 10, 2005	1	RT	Total	Absent--M0050811PH49-2		N/A	0.18	Aug 16, 2005
Aug 10, 2005	1	RT	Total	Absent--M0050811PH49-1		N/A	0.18	Aug 16, 2005
Aug 03, 2005	1	RT	Total	Absent--M0050804PD24-2		N/A	0.24	Aug 09, 2005
Aug 03, 2005	1	RT	Total	Absent--M0050804PD24-1		N/A	0.24	Aug 09, 2005
Jul 27, 2005	1	RT	Total	Absent--M0050728PI29-2		N/A	0.30	Aug 01, 2005
Jul 27, 2005	1	RT	Total	Absent--M0050728PI29-1		N/A	0.30	Aug 01, 2005
Jul 20, 2005	1	RT	Total	Absent--M0050721PK215-2		N/A	0.18	Jul 25, 2005
Jul 20, 2005	1	RT	Total	Absent--M0050721PK215-1		N/A	0.18	Jul 25, 2005
Jul 13, 2005	1	RT	Total	Absent--M0050714PE27-2		N/A	0.04	Jul 18, 2005
Jul 13, 2005	1	RT	Total	Absent--M0050714PE27-1		N/A	0.04	Jul 18, 2005
Jul 06, 2005	1	RT	Total	Absent--M0050707PK223-2		N/A	0.14	Jul 11, 2005
Jul 06, 2005	1	RT	Total	Absent--M0050707PK223-1		N/A	0.14	Jul 11, 2005
Jun 29, 2005	1	RT	Total	Absent--M0050630PJ212-2		N/A	0.23	Jul 11, 2005
Jun 29, 2005	1	RT	Total	Absent--M0050630PJ212-1		N/A	0.23	Jul 11, 2005
Jun 22, 2005	1	RT	Total	Absent--M0050623PE26-2		N/A	0.03	Jun 27, 2005
Jun 22, 2005	1	RT	Total	Absent--M0050623PE26-1		N/A	0.03	Jun 27, 2005
Jun 15, 2005	1	RT	Total	Absent--M0050616PC210-2		N/A	0.16	Jun 20, 2005
Jun 15, 2005	1	RT	Total	Absent--M0050616PC210-1		N/A	0.16	Jun 20, 2005
Jun 08, 2005	1	RT	Total	Absent--M0050609PF210-2		N/A	0.27	Jun 13, 2005
Jun 08, 2005	1	RT	Total	Absent--M0050609PF210-1		N/A	0.27	Jun 13, 2005
Jun 01, 2005	1	RT	Total	Absent--M0050602PG417-2		N/A	0.25	Jun 06, 2005
Jun 01, 2005	1	RT	Total	Absent--M0050602PG417-1		N/A	0.25	Jun 06, 2005
May 25, 2005	1	RT	Total	Absent--M0050526PE29-2		N/A	0.16	Jun 06, 2005
May 25, 2005	1	RT	Total	Absent--M0050526PE29-1		N/A	0.16	Jun 06, 2005
May 18, 2005	1	RT	Total	Absent--M0050519PG212-2		N/A	0.10	May 23, 2005
May 18, 2005	1	RT	Total	Absent--M0050519PG212-1		N/A	0.10	May 23, 2005
May 11, 2005	1	RT	Total	Absent--M0050512PI212-2		N/A	0.24	May 16, 2005
May 11, 2005	1	RT	Total	Absent--M0050512PI212-1		N/A	0.24	May 16, 2005
May 04, 2005	1	RT	Total	Absent--M0050505PH48-2		N/A	0.03	May 11, 2005
May 04, 2005	1	RT	Total	Absent--M0050505PH48-1		N/A	0.03	May 11, 2005
Apr 27, 2005	1	RT	Total	Absent--M0050428PG214-2		N/A	0.17	May 02, 2005
Apr 27, 2005	1	RT	Total	Absent--M0050428PG214-1		N/A	0.17	May 02, 2005
Apr 20, 2005	1	RT	Total	Absent--M0050421PC23-2		N/A	0.24	Apr 28, 2005
Apr 20, 2005	1	RT	Total	Absent--M0050421PC23-1		N/A	0.24	Apr 28, 2005

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Apr 13, 2005	1	RT	Total	Absent--M0050414PG213-2		N/A	0.20	Apr 18, 2005
Apr 13, 2005	1	RT	Total	Absent--M0050414PG213-1		N/A	0.20	Apr 18, 2005
Apr 06, 2005	1	RT	Total	Absent--M0050407PA41-4		N/A	0.13	Apr 11, 2005
Apr 06, 2005	1	RT	Total	Absent--M0050407PA41-3		N/A	0.13	Apr 11, 2005
Apr 06, 2005	1	RT	Total	Absent--M0050407PA41-2		N/A	0.13	Apr 11, 2005
Apr 06, 2005	1	RT	Total	Absent--M0050407PA41-1		N/A	0.13	Apr 11, 2005
Mar 30, 2005	1	RT	Total	Absent--M0050331PC23-2		N/A	0.14	Apr 04, 2005
Mar 30, 2005	1	RT	Total	Absent--M0050331PC23-1		N/A	0.14	Apr 04, 2005
Mar 23, 2005	1	RT	Total	Absent--M0050324PA21-2		N/A	0.29	Mar 28, 2005
Mar 23, 2005	1	RT	Total	Absent--M0050324PA21-1		N/A	0.29	Mar 28, 2005
Mar 16, 2005	1	RT	Total	Absent--M0050317PC23-2		N/A	0.26	Mar 21, 2005
Mar 16, 2005	1	RT	Total	Absent--M0050317PC23-1		N/A	0.26	Mar 21, 2005
Mar 09, 2005	1	RT	Total	Absent--M0050310PC23-2		N/A	0.23	Mar 14, 2005
Mar 09, 2005	1	RT	Total	Absent--M0050310PC23-1		N/A	0.23	Mar 14, 2005
Mar 02, 2005	1	RT	Total	Absent--M0050303PD44-2		N/A	0.22	Mar 09, 2005
Mar 02, 2005	1	RT	Total	Absent--M0050303PD44-1		N/A	0.22	Mar 09, 2005
Feb 23, 2005	1	RT	Total	Absent--M0050224PE26-2		N/A	0.30	Mar 02, 2005
Feb 23, 2005	1	RT	Total	Absent--M0050224PE26-1		N/A	0.30	Mar 02, 2005
Feb 16, 2005	1	RT	Total	Absent--M0050217PE26-2		N/A	0.23	Feb 22, 2005
Feb 16, 2005	1	RT	Total	Absent--M0050217PE26-1		N/A	0.23	Feb 22, 2005
Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Feb 09, 2005	1	RT	Total	Absent--M0050210PF26-2		N/A	0.18	Feb 14, 2005
Feb 09, 2005	1	RT	Total	Absent--M0050210PF26-1		N/A	0.18	Feb 14, 2005
Feb 02, 2005	1	RT	Total	Absent--M0050203PH48-2		N/A	0.26	Feb 07, 2005
Feb 02, 2005	1	RT	Total	Absent--M0050203PH48-1		N/A	0.26	Feb 07, 2005
Jan 26, 2005	1	RT	Total	Absent--M0050127PD24-2		N/A	0.09	Jan 31, 2005
Jan 26, 2005	1	RT	Total	Absent--M0050127PD24-1		N/A	0.09	Jan 31, 2005
Jan 19, 2005	1	RT	Total	Absent--M0050120PI210-2		N/A	0.29	Jan 24, 2005
Jan 19, 2005	1	RT	Total	Absent--M0050120PI210-1		N/A	0.29	Jan 24, 2005
Jan 12, 2005	1	RT	Total	Absent--M0050113PE28-2		N/A	0.24	Jan 18, 2005
Jan 12, 2005	1	RT	Total	Absent--M0050113PE28-1		N/A	0.24	Jan 18, 2005
Jan 05, 2005	1	RT	Total	Absent--M0050106PE28-2		N/A	0.12	Jan 10, 2005
Jan 05, 2005	1	RT	Total	Absent--M0050106PE28-1		N/A	0.12	Jan 10, 2005
Dec 29, 2004	1	RT	Total	Absent--M0041230PA21-2		N/A	0.26	Jan 05, 2005
Dec 29, 2004	1	RT	Total	Absent--M0041230PA21-1		N/A	0.26	Jan 05, 2005
Dec 20, 2004	1	RT	Total	Absent--M0041221PD24-2		N/A	0.20	Dec 28, 2004
Dec 20, 2004	1	RT	Total	Absent--M0041221PD24-1		N/A	0.20	Dec 28, 2004

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Dec 15, 2004	1	RT	Total	Absent--M0041216PC24-2		N/A	0.15	Dec 20, 2004
Dec 15, 2004	1	RT	Total	Absent--M0041216PC24-1		N/A	0.15	Dec 20, 2004
Dec 08, 2004	1	RT	Total	Absent--M0041209PH212-2		N/A	0.10	Dec 13, 2004
Dec 08, 2004	1	RT	Total	Absent--M0041209PH212-1		N/A	0.10	Dec 13, 2004

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Dec 01, 2004	1	RT	Total	Absent--M0041202PB42-2		N/A	0.19	Dec 13, 2004
Dec 01, 2004	1	RT	Total	Absent--M0041202PB42-1		N/A	0.19	Dec 13, 2004
Nov 22, 2004	1	RT	Total	Absent--M0041123PF36-3		N/A	0.17	Dec 01, 2004
Nov 22, 2004	1	RT	Total	Absent--M0041123PF36-2		N/A	0.17	Dec 01, 2004
Nov 22, 2004	1	RT	Total	Absent--M0041123PF36-1		N/A	0.17	Dec 01, 2004
Nov 17, 2004	1	RT	Total	Absent--M0041118PD37-3		N/A	0.25	Nov 24, 2004
Nov 17, 2004	1	RT	Total	Absent--M0041118PD37-2		N/A	0.25	Nov 24, 2004
Nov 17, 2004	1	RT	Total	Absent--M0041118PD37-1		N/A	0.25	Nov 24, 2004
Nov 03, 2004	1	RT	Total	Absent--M0041104PM414-2		N/A	0.12	Nov 10, 2004
Nov 03, 2004	1	RT	Total	Absent--M0041104PM414-1		N/A	0.12	Nov 10, 2004
Oct 27, 2004	1	RT	Total	Absent--M0041028PF26-2		N/A	0.29	Nov 03, 2004
Oct 27, 2004	1	RT	Total	Absent--M0041028PF26-1		N/A	0.29	Nov 03, 2004
Oct 20, 2004	1	RT	Total	Absent--M0041021PF26-2		N/A	0.08	Nov 03, 2004
Oct 20, 2004	1	RT	Total	Absent--M0041021PF26-1		N/A	0.08	Nov 03, 2004
Oct 13, 2004	1	RT	Total	Absent--M0041014PE27-2		N/A	0.26	Oct 18, 2004
Oct 13, 2004	1	RT	Total	Absent--M0041014PE27-1		N/A	0.26	Oct 18, 2004
Oct 06, 2004	1	RT	Total	Absent--M0041007PE210-2		N/A	0.12	Oct 12, 2004
Oct 06, 2004	1	RT	Total	Absent--M0041007PE210-1		N/A	0.12	Oct 12, 2004
Sep 22, 2004	1	RT	Total	Absent--M0040923PH212-2		N/A	0.21	Oct 04, 2004
Sep 22, 2004	1	RT	Total	Absent--M0040923PH212-1		N/A	0.21	Oct 04, 2004

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Sep 15, 2004	1	RT	Total	Absent--M0040916PD26-2		N/A	0.17	Oct 04, 2004
Sep 15, 2004	1	RT	Total	Absent--M0040916PD26-1		N/A	0.17	Oct 04, 2004
Sep 08, 2004	1	RT	Total	Absent--M0040909PK228-2		N/A	0.07	Sep 13, 2004
Sep 08, 2004	1	RT	Total	Absent--M0040909PK228-1		N/A	0.07	Sep 13, 2004
Sep 01, 2004	1	RT	Total	Absent--M0040902PH215-2		N/A	0.20	Sep 07, 2004
Sep 01, 2004	1	RT	Total	Absent--M0040902PH215-1		N/A	0.20	Sep 07, 2004
Aug 25, 2004	1	RT	Total	Absent--M0040826PG210-2		N/A	0.19	Aug 30, 2004
Aug 25, 2004	1	RT	Total	Absent--M0040826PG210-1		N/A	0.19	Aug 30, 2004
Aug 18, 2004	1	RT	Total	Absent--M0040819PF46-2		N/A	0.16	Aug 23, 2004
Aug 18, 2004	1	RT	Total	Absent--M0040819PF46-1		N/A	0.16	Aug 23, 2004
Aug 11, 2004	1	RT	Total	Absent--M0040812PH211-2		N/A	0.34	Aug 16, 2004
Aug 11, 2004	1	RT	Total	Absent--M0040812PH211-1		N/A	0.34	Aug 16, 2004

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Aug 04, 2004	1	RT	Total	Absent--M0040805PD26-2		N/A	0.22	Aug 11, 2004
Aug 04, 2004	1	RT	Total	Absent--M0040805PD26-1		N/A	0.22	Aug 11, 2004
Jul 28, 2004	1	RT	Total	Absent--M0040729PD24-2		N/A	0.23	Aug 02, 2004
Jul 28, 2004	1	RT	Total	Absent--M0040729PD24-1		N/A	0.23	Aug 02, 2004
Jul 21, 2004	1	RT	Total	Absent--M0040722PG27-2		N/A	0.19	Aug 02, 2004
Jul 21, 2004	1	RT	Total	Absent--M0040722PG27-1		N/A	0.19	Aug 02, 2004
Jul 14, 2004	1	RT	Total	Absent--M0040715PK216-2		N/A	0.34	Jul 29, 2004
Jul 14, 2004	1	RT	Total	Absent--M0040715PK216-1		N/A	0.34	Jul 29, 2004
Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Jul 08, 2004	1	RT	Total	Absent--M0040709PC24-2		N/A	0.25	Jul 19, 2004
Jul 08, 2004	1	RT	Total	Absent--M0040709PC24-1		N/A	0.25	Jul 19, 2004
Jun 23, 2004	1	RT	Total	Absent--M0040624PF27-2		N/A		Jun 28, 2004
Jun 23, 2004	1	RT	Total	Absent--M0040624PF27-1		N/A		Jun 28, 2004
Jun 16, 2004	1	RT	Total	Absent--M0040617PD25-2		N/A		Jun 21, 2004
Jun 16, 2004	1	RT	Total	Absent--M0040617PD25-1		N/A		Jun 21, 2004
Jun 09, 2004	1	RT	Total	Absent--M0040610PD24-2		N/A		Jun 17, 2004
Jun 09, 2004	1	RT	Total	Absent--M0040610PD24-1		N/A		Jun 17, 2004
Jun 02, 2004	1	RT	Total	Absent--M004603PH312-2		N/A		Jun 07, 2004
Jun 02, 2004	1	RT	Total	Absent--M004603PH312-1		N/A		Jun 07, 2004
May 26, 2004	1	RT	Total	Absent--M0040527PK212-2		N/A		Jun 02, 2004
May 26, 2004	1	RT	Total	Absent--M0040527PK212-1		N/A		Jun 02, 2004
May 19, 2004	1	RT	Total	Absent--M0040520PG213-2		N/A		May 25, 2004
May 19, 2004	1	RT	Total	Absent--M0040520PG213-1		N/A		May 25, 2004
May 12, 2004	1	RT	Total	Absent--M0040513PE25-2		N/A		May 25, 2004
May 12, 2004	1	RT	Total	Absent--M0040513PE25-1		N/A		May 25, 2004
May 05, 2004	1	RT	Total	Absent--M0040506PD24-2		N/A		May 10, 2004
May 05, 2004	1	RT	Total	Absent--M0040506PD24-1		N/A		May 10, 2004
Apr 28, 2004	1	RT	Total	Absent--M0040429PB22-2		N/A		May 04, 2004
Apr 28, 2004	1	RT	Total	Absent--M0040429PB22-1		N/A		May 04, 2004
Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Apr 21, 2004	1	RT	Total	Absent--M0040422PE35-2		N/A		Apr 28, 2004
Apr 21, 2004	1	RT	Total	Absent--M0040422PE35-1		N/A		Apr 28, 2004
Apr 14, 2004	1	RT	Total	Absent--M0040415PG213-2		N/A		Apr 19, 2004
Apr 14, 2004	1	RT	Total	Absent--M0040415PG213-1		N/A		Apr 19, 2004
Apr 08, 2004	1	RT	Total	Absent--M0040409PC26-2		N/A		Apr 19, 2004
Apr 08, 2004	1	RT	Total	Absent--M0040409PC26-1		N/A		Apr 19, 2004
Mar 24, 2004	1	RT	Total	Absent--M0040325PD46-2		N/A		Mar 29, 2004
Mar 24, 2004	1	RT	Total	Absent--M0040325PD46-1		N/A		Mar 29, 2004

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Mar 17, 2004	1	RT	Total	Absent--M0040318PF212-2		N/A		Mar 22, 2004
Mar 17, 2004	1	RT	Total	Absent--M0040318PF212-1		N/A		Mar 22, 2004
Mar 10, 2004	1	RT	Total	Absent--M0040311PF26-2		N/A		Mar 15, 2004
Mar 10, 2004	1	RT	Total	Absent--M0040311PF26-1		N/A		Mar 15, 2004
Mar 03, 2004	1	RT	Total	Absent--M0040304PC27-2		N/A		Mar 08, 2004
Mar 03, 2004	1	RT	Total	Absent--M0040304PC27-1		N/A		Mar 08, 2004
Feb 25, 2004	1	RT	Total	Absent--M0040226PC23-2		N/A		Mar 01, 2004
Feb 25, 2004	1	RT	Total	Absent--M0040226PC23-1		N/A		Mar 01, 2004
Feb 18, 2004	1	RT	Total	Absent--M0040219PG29-2		N/A		Feb 25, 2004
Feb 18, 2004	1	RT	Total	Absent--M0040219PG29-1		N/A		Feb 25, 2004
Feb 11, 2004	1	RT	Total	Absent--M0040212PD24-2		N/A		Feb 17, 2004
Feb 11, 2004	1	RT	Total	Absent--M0040212PD24-1		N/A		Feb 17, 2004
Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Feb 04, 2004	1	RT	Total	Absent--M0040205PD24-2		N/A		Feb 09, 2004
Feb 04, 2004	1	RT	Total	Absent--M0040205PD24-1		N/A		Feb 09, 2004
Jan 28, 2004	1	RT	Total	Absent--M0040129PD24-2		N/A		Feb 04, 2004
Jan 28, 2004	1	RT	Total	Absent--M0040129PD24-1		N/A		Feb 04, 2004
Jan 21, 2004	1	RT	Total	Absent--M0040122PC23-2		N/A		Jan 26, 2004
Jan 21, 2004	1	RT	Total	Absent--M0040122PC23-1		N/A		Jan 26, 2004
Jan 14, 2004	1	RT	Total	Absent--M0040115PF26-2		N/A		Jan 20, 2004
Jan 14, 2004	1	RT	Total	Absent--M0040115PF26-1		N/A		Jan 20, 2004
Jan 07, 2004	1	RT	Total	Absent--M0040108PA21-2		N/A		Jan 12, 2004
Jan 07, 2004	1	RT	Total	Absent--M0040108PA21-1		N/A		Jan 12, 2004
Dec 17, 2003	1	RT	Total	Absent--M0031218PD24-2		N/A		Dec 22, 2003
Dec 17, 2003	1	RT	Total	Absent--M0031218PD24-1		N/A		Dec 22, 2003
Dec 05, 2003	1	RT	Total	Absent--66001-2		N/A		Dec 15, 2003
Dec 05, 2003	1	RT	Total	Absent--66001-1		N/A		Dec 15, 2003
Dec 03, 2003	1	RT	Total	Absent--M0031204PG28-2		N/A		Dec 10, 2003
Dec 03, 2003	1	RT	Total	Absent--M0031204PG28-1		N/A		Dec 10, 2003
Dec 01, 2003	1	RT	Total	Absent--M0031211PF211-2		N/A		Dec 15, 2003
Dec 01, 2003	1	RT	Total	Absent--M0031211PF211-1		N/A		Dec 15, 2003
Nov 24, 2003	1	RT	Total	Absent--M0031125PI29-2		N/A		Nov 28, 2003
Nov 24, 2003	1	RT	Total	Absent--M0031125PI29-1		N/A		Nov 28, 2003
Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Nov 19, 2003	1	RT	Total	Absent--M0031120PD24-2		N/A		Nov 26, 2003
Nov 19, 2003	1	RT	Total	Absent--M0031120PD24-1		N/A		Nov 26, 2003
Nov 12, 2003	1	RT	Total	Absent--M0031113PI29-2		N/A		Nov 17, 2003
Nov 12, 2003	1	RT	Total	Absent--M0031113PI29-1		N/A		Nov 17, 2003

Nov 05, 2003	1	RT	Total	Absent--M0031106PH216-2		N/A		Nov 10, 2003
Nov 05, 2003	1	RT	Total	Absent--M0031106PH216-1		N/A		Nov 10, 2003
Oct 29, 2003	1	RT	Total	Absent--M0031030PF26-2		321 S ELIZABETH		Nov 06, 2003
Oct 29, 2003	1	RT	Total	Absent--M0031030PF26-1		321 S ELIZABETH		Nov 06, 2003
Oct 22, 2003	1	RT	Total	Absent--M0031023PG212-2		N/A		Oct 29, 2003
Oct 22, 2003	1	RT	Total	Absent--M0031023PG212-1		N/A		Oct 29, 2003
Oct 15, 2003	1	RT	Total	Absent--M0031016PG28-2		N/A		Oct 20, 2003
Oct 15, 2003	1	RT	Total	Absent--M0031016PG28-1		N/A		Oct 20, 2003
Oct 08, 2003	1	RT	Total	Absent--M0031009PJ211-2		N/A		Oct 14, 2003
Oct 08, 2003	1	RT	Total	Absent--M0031009PJ211-1		N/A		Oct 14, 2003
Oct 01, 2003	1	RT	Total	Absent--M0031002PD24-2		N/A		Oct 08, 2003
Oct 01, 2003	1	RT	Total	Absent--M0031002PD24-1		N/A		Oct 08, 2003
Sep 24, 2003	1	RT	Total	Absent--M0030925PI216-2		N/A		Oct 03, 2003
Sep 24, 2003	1	RT	Total	Absent--M0030925PI216-1		N/A		Oct 03, 2003
Sep 17, 2003	1	RT	Total	Absent--M0030918PJ217-2		N/A		Sep 22, 2003
Sep 17, 2003	1	RT	Total	Absent--M0030918PJ217-1		N/A		Sep 22, 2003

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Sep 10, 2003	1	RT	Total	Absent--M0030911PG212-2		N/A		Sep 22, 2003
Sep 10, 2003	1	RT	Total	Absent--M0030911PG212-1		N/A		Sep 22, 2003
Sep 03, 2003	1	RT	Total	Absent--M0030904PG211-2		N/A		Sep 15, 2003
Sep 03, 2003	1	RT	Total	Absent--M0030904PG211-1		N/A		Sep 15, 2003
Aug 27, 2003	1	RT	Total	Absent--M0030828PF211-2		N/A		Sep 04, 2003
Aug 27, 2003	1	RT	Total	Absent--M0030828PF211-1		N/A		Sep 04, 2003
Aug 20, 2003	1	RT	Total	Absent--M0030821PG27		N/A		Aug 27, 2003
Aug 20, 2003	1	RT	Total	Absent--M0030821PG28		N/A		Aug 27, 2003
Aug 13, 2003	1	RT	Total	Absent--M0030814PH210-2		N/A		Aug 18, 2003
Aug 13, 2003	1	RT	Total	Absent--M0030814PH210-1		N/A		Aug 18, 2003
Aug 06, 2003	1	RT	Total	Absent--M0030807PG211-2		N/A		Aug 11, 2003
Aug 06, 2003	1	RT	Total	Absent--M0030807PG211-1		N/A		Aug 11, 2003
Jul 23, 2003	1	RT	Total	Absent--M0030724PC23-2		N/A		Jul 30, 2003
Jul 23, 2003	1	RT	Total	Absent--M0030724PC23-1		N/A		Jul 30, 2003
Jul 16, 2003	1	RT	Total	Absent--M030717PF27-2		N/A		Jul 23, 2003
Jul 16, 2003	1	RT	Total	Absent--M030717PF27-1		N/A		Jul 23, 2003
Jul 09, 2003	1	RT	Total	Absent--M0030710PF26-2		N/A		Jul 16, 2003
Jul 09, 2003	1	RT	Total	Absent--M0030710PF26-1		N/A		Jul 16, 2003
Jul 02, 2003	1	RT	Total	Absent--M0030703PG210-2		N/A		Jul 16, 2003
Jul 02, 2003	1	RT	Total	Absent--M0030703PG210-1		N/A		Jul 16, 2003

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Jun 25, 2003	1	RT	Total	Absent--M0030626PE28		N/A		Jul 08, 2003
Jun 25, 2003	1	RT	Total	Absent--M0030626PE27		N/A		Jul 23, 2003
Jun 18, 2003	1	RT	Total	Absent--M0030619PF210-2		N/A		Jul 08, 2003
Jun 18, 2003	1	RT	Total	Absent--M0030619PF210-1		N/A		Jul 08, 2003
Jun 11, 2003	1	RT	Total	Absent--M0030612PE25-2		N/A		Jun 23, 2003
Jun 11, 2003	1	RT	Total	Absent--M0030612PE25-1		N/A		Jun 23, 2003
Jun 04, 2003	1	RT	Total	Absent--M0030605PH29-2		N/A		Jun 09, 2003
Jun 04, 2003	1	RT	Total	Absent--M0030605PH29-1		N/A		Jun 09, 2003
May 28, 2003	1	RT	Total	Absent--M0030529PF28-2		N/A		Jun 02, 2003
May 28, 2003	1	RT	Total	Absent--M0030529PF28-1		N/A		Jun 02, 2003
May 21, 2003	1	RT	Total	Absent--M0030522PE26-2		N/A		May 27, 2003
May 21, 2003	1	RT	Total	Absent--M0030522PE26-1		N/A		May 27, 2003
May 15, 2003	1	RT	Total	Absent--M0030516PE27-2		N/A		May 27, 2003
May 15, 2003	1	RT	Total	Absent--M0030516PE27-1		N/A		May 27, 2003
May 07, 2003	1	RT	Total	Absent--M0030508PE210-2		N/A		May 12, 2003
May 07, 2003	1	RT	Total	Absent--M0030508PE210-1		N/A		May 12, 2003
Apr 23, 2003	1	RT	Total	Absent--M0030424PE25-2		N/A		May 05, 2003
Apr 23, 2003	1	RT	Total	Absent--M0030424PE25-1		N/A		May 05, 2003
Apr 16, 2003	1	RT	Total	Absent--M0030417PH29-2		N/A		Apr 21, 2003
Apr 16, 2003	1	RT	Total	Absent--M0030417PH29-1		N/A		Apr 21, 2003
Apr 10, 2003	1	RT	Total	Absent--M0030411PE26-2		N/A		Apr 21, 2003
Apr 10, 2003	1	RT	Total	Absent--M0030411PE26-1		N/A		Apr 21, 2003
Apr 02, 2003	1	RT	Total	Absent--M0030403PB23-2		N/A		Apr 07, 2003
Apr 02, 2003	1	RT	Total	Absent--M0030403PB23-1		N/A		Apr 07, 2003
Mar 26, 2003	1	RT	Total	Absent--M0030327PA21-2		N/A		Apr 07, 2003
Mar 26, 2003	1	RT	Total	Absent--M0030327PA21-1		N/A		Apr 07, 2003
Mar 19, 2003	1	RT	Total	Absent--M0030320PJ212-2		N/A		Mar 24, 2003
Mar 19, 2003	1	RT	Total	Absent--M0030320PJ212-1		N/A		Mar 24, 2003
Mar 12, 2003	1	RT	Total	Absent--M0030314PI28-2		N/A		Mar 24, 2003
Mar 12, 2003	1	RT	Total	Absent--M0030314PI28-1		N/A		Mar 24, 2003
Mar 05, 2003	1	RT	Total	Absent--M0030306PH210-2		N/A		Mar 11, 2003
Mar 05, 2003	1	RT	Total	Absent--M0030306PH210-1		N/A		Mar 11, 2003
Feb 26, 2003	1	RT	Total	Absent--M0030227PB22-2		N/A		Mar 03, 2003
Feb 26, 2003	1	RT	Total	Absent--M0030227PB22-1		N/A		Mar 03, 2003
Feb 12, 2003	1	RT	Total	Absent--M0030213PG28-2		N/A		Mar 03, 2003
Feb 12, 2003	1	RT	Total	Absent--M0030213PG28-1		N/A		Mar 03, 2003
Feb 05, 2003	1	RT	Total	Absent--M0030206PG29-2		N/A		Feb 12, 2003
Feb 05, 2003	1	RT	Total	Absent--M0030206PG29-1		N/A		Feb 12, 2003
Jan 29, 2003	1	RT	Total	Absent--M0030130PF29-2		N/A		Feb 05, 2003

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Jan 29, 2003	1	RT	Total	Absent--M0030130PF29-1		N/A		Feb 05, 2003

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Jan 22, 2003	1	RT	Total	Absent--M0030123PK214-2		N/A		Feb 05, 2003
Jan 22, 2003	1	RT	Total	Absent--M0030123PK214-1		N/A		Feb 05, 2003
Jan 15, 2003	1	RT	Total	Absent--M0030116PD26-2		N/A		Jan 27, 2003
Jan 15, 2003	1	RT	Total	Absent--M0030116PD26-1		N/A		Jan 27, 2003
Jan 08, 2003	1	RT	Total	Absent--M0030109PE313-2		N/A		Jan 27, 2003
Jan 08, 2003	1	RT	Total	Absent--M0030109PE313-1		N/A		Jan 27, 2003
Jan 02, 2003	1	RT	Total	Absent--030103PC23-2		N/A		Jan 13, 2003
Jan 02, 2003	1	RT	Total	Absent--030103PC23-1		N/A		Jan 13, 2003
Dec 26, 2002	1	RT	Total	Absent--021227PC25-2		N/A		Jan 02, 2003
Dec 26, 2002	1	RT	Total	Absent--021227PC25-1		N/A		Jan 02, 2003
Dec 19, 2002	1	RT	Total	Absent--M0030220PI210-2		N/A		Mar 03, 2003
Dec 19, 2002	1	RT	Total	Absent--M0030220PI210-1		N/A		Mar 03, 2003
Dec 18, 2002	1	RT	Total	Absent--021219PB22-2		N/A		Jan 02, 2003
Dec 18, 2002	1	RT	Total	Absent--021219PB22-1		N/A		Jan 02, 2003
Dec 11, 2002	1	RT	Total	Absent--021212PF26-2		N/A		Dec 16, 2002
Dec 11, 2002	1	RT	Total	Absent--021212PF26-1		N/A		Dec 16, 2002
Dec 04, 2002	1	RT	Total	Absent--021205PH28-2		N/A		Dec 12, 2002
Dec 04, 2002	1	RT	Total	Absent--021205PH28-1		N/A		Dec 12, 2002
Nov 25, 2002	1	RT	Total	Absent--021126PI29-2		N/A		Dec 04, 2002
Nov 25, 2002	1	RT	Total	Absent--021126PI29-1		N/A		Dec 04, 2002

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Nov 20, 2002	1	RT	Total	Absent--21121PG210-2		N/A		Nov 25, 2002
Nov 20, 2002	1	RT	Total	Absent--21121PG210-1		N/A		Nov 25, 2002
Nov 13, 2002	1	RT	Total	Absent--215114PG23-2		N/A		Nov 25, 2002
Nov 13, 2002	1	RT	Total	Absent--215114PG23-1		N/A		Nov 25, 2002
Nov 06, 2002	1	RT	Total	Absent--21107PL224-2		N/A		Nov 18, 2002
Nov 06, 2002	1	RT	Total	Absent--21107PL224-1		N/A		Nov 18, 2002
Oct 30, 2002	1	RT	Total	Absent--021031PF26-2		N/A		Nov 04, 2002
Oct 30, 2002	1	RT	Total	Absent--021031PF26-1		N/A		Nov 04, 2002
Oct 23, 2002	1	RT	Total	Absent--021024PB12		N/A		Oct 30, 2002
Oct 16, 2002	1	RT	Total	Absent--021017PG28-2		N/A		Oct 21, 2002
Oct 16, 2002	1	RT	Total	Absent--021017PG28-1		N/A		Oct 21, 2002
Oct 09, 2002	1	RT	Total	Absent--21010PH211-2		N/A		Oct 21, 2002
Oct 09, 2002	1	RT	Total	Absent--21010PH211-1		N/A		Oct 21, 2002
Oct 02, 2002	1	RT	Total	Absent--21003PG210-2		N/A		Oct 14, 2002
Oct 02, 2002	1	RT	Total	Absent--21003PG210-1		N/A		Oct 14, 2002

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Sep 25, 2002	1	RT	Total	Absent--20926PI210		N/A		Oct 03, 2002
Sep 25, 2002	1	RT	Total	Absent--20926PI211		N/A		Oct 03, 2002
Sep 18, 2002	1	RT	Total	Absent--020919PD24-2		N/A		Sep 25, 2002
Sep 18, 2002	1	RT	Total	Absent--020919PD24-1		N/A		Sep 25, 2002
Sep 11, 2002	1	RT	Total	Absent--20912PD24-2		N/A		Sep 18, 2002
Sep 11, 2002	1	RT	Total	Absent--20912PD24-1		N/A		Sep 18, 2002
Sep 04, 2002	1	RT	Total	Absent--20905PF210-2		S WALNUT		Sep 11, 2002
Sep 04, 2002	1	RT	Total	Absent--20905PF210-1		S WALNUT		Sep 11, 2002
Aug 28, 2002	1	RT	Total	Absent--020829PE26-2		VINING ST		Sep 06, 2002
Aug 28, 2002	1	RT	Total	Absent--020829PE26-1		VINING ST		Sep 06, 2002
Aug 21, 2002	1	RT	Total	Absent--20822PH210-2		N/A		Sep 06, 2002
Aug 21, 2002	1	RT	Total	Absent--20822PH210-1		N/A		Sep 06, 2002
Aug 14, 2002	1	RT	Total	Absent--020815PF26-2		N/A		
Aug 14, 2002	1	RT	Total	Absent--020815PF26-1		N/A		
Aug 07, 2002	1	RT	Total	Absent--20808PM216-2		N/A		
Aug 07, 2002	1	RT	Total	Absent--20808PM216-1		N/A		
Jul 24, 2002	1	RT	Total	Absent--20725PK211-2		N/A		
Jul 24, 2002	1	RT	Total	Absent--20725PK211-1		N/A		
Jul 17, 2002	1	RT	Total	Absent--20718PF26-2		N/A		
Jul 17, 2002	1	RT	Total	Absent--20718PF26-1		N/A		
Jul 10, 2002	1	RT	Total	Absent--20711PH214-2		N/A		
Jul 10, 2002	1	RT	Total	Absent--20711PH214-1		N/A		
Jul 02, 2002	1	RT	Total	Absent--20703PG27-2		N/A		
Jul 02, 2002	1	RT	Total	Absent--20703PG27-1		N/A		
Jun 26, 2002	1	RT	Total	Absent--20627PK213-2		N/A		
Jun 26, 2002	1	RT	Total	Absent--20627PK213-1		N/A		
Jun 19, 2002	1	RT	Total	Absent--20620PJ210-2		N/A		Jun 26, 2002
Jun 19, 2002	1	RT	Total	Absent--20620PJ210-1		N/A		Jun 26, 2002
Jun 12, 2002	1	RT	Total	Absent--6132PJ216-2		N/A		Jun 17, 2002
Jun 12, 2002	1	RT	Total	Absent--6132PJ216-1		N/A		Jun 17, 2002
Jun 05, 2002	1	RT	Total	Absent--20606PH215-2		N/A		Jun 11, 2002
Jun 05, 2002	1	RT	Total	Absent--20606PH215-1		N/A		Jun 11, 2002
May 29, 2002	1	RT	Total	Absent--20530PI212-2		N/A		Jun 05, 2002
May 29, 2002	1	RT	Total	Absent--20530PI212-1		N/A		Jun 05, 2002
May 22, 2002	1	RT	Total	Absent--20523PI213-2		N/A		May 31, 2002
May 22, 2002	1	RT	Total	Absent--20523PI213-1		N/A		May 31, 2002

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
May 15, 2002	1	RT	Total	Absent--20516PJ221-2		N/A		May 20, 2002
May 15, 2002	1	RT	Total	Absent--20516PJ221-1		N/A		May 20, 2002
May 15, 2002	1	RT	Total	Absent--42-20516PJ-2		N/A		May 20, 2002
May 15, 2002	1	RT	Total	Absent--42-20516PJ-1		N/A		May 20, 2002
May 08, 2002	1	RT	Total	Absent--20509PF29		N/A		May 13, 2002
May 08, 2002	1	RT	Total	Absent--20509PF28		N/A		May 13, 2002
May 01, 2002	1	RT	Total	Absent--20502PF28-2		N/A		May 08, 2002
May 01, 2002	1	RT	Total	Absent--20502PF28-1		N/A		May 08, 2002
Apr 24, 2002	1	RT	Total	Absent--20425PD24-2		N/A		Apr 29, 2002
Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Apr 24, 2002	1	RT	Total	Absent--20425PD24-1		N/A		Apr 29, 2002
Apr 17, 2002	1	RT	Total	Absent--20418P+D25-2		N/A		Apr 24, 2002
Apr 17, 2002	1	RT	Total	Absent--20418P+D25-1		N/A		Apr 24, 2002
Apr 10, 2002	1	RT	Total	Absent--20411PK316-2		N/A		Apr 16, 2002
Apr 10, 2002	1	RT	Total	Absent--20411PK316-1		N/A		Apr 16, 2002
Apr 04, 2002	1	RT	Total	Absent--20405PD26-2		N/A		Apr 15, 2002
Apr 04, 2002	1	RT	Total	Absent--20405PD26-1		N/A		Apr 15, 2002
Mar 27, 2002	1	RT	Total	Absent--20328PG27-2		N/A		Apr 01, 2002
Mar 27, 2002	1	RT	Total	Absent--20328PG27-1		N/A		Apr 01, 2002
Mar 20, 2002	1	RT	Total	Absent--20321PG27-2		N/A		Mar 25, 2002
Mar 20, 2002	1	RT	Total	Absent--20321PG27-1		N/A		Mar 25, 2002
Mar 13, 2002	1	RT	Total	Absent--20314PF210-2		N/A		Mar 18, 2002
Mar 13, 2002	1	RT	Total	Absent--20314PF210-1		N/A		Mar 18, 2002
Mar 06, 2002	1	RT	Total	Absent--20307PE23-2		N/A		Mar 11, 2002
Mar 06, 2002	1	RT	Total	Absent--20307PE23-1		N/A		Mar 11, 2002
Feb 27, 2002	1	RT	Total	Absent--020228PE26-2		N/A		Mar 05, 2002
Feb 27, 2002	1	RT	Total	Absent--020228PE26-1		N/A		Mar 05, 2002
Feb 20, 2002	1	RT	Total	Absent--20221PG210-2		N/A		Feb 25, 2002
Feb 20, 2002	1	RT	Total	Absent--20221PG210-1		N/A		Feb 25, 2002
Feb 13, 2002	1	RT	Total	Absent--20214PE28-2		N/A		Feb 19, 2002
Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Feb 13, 2002	1	RT	Total	Absent--20214PE28-1		N/A		Feb 19, 2002
Feb 06, 2002	1	RT	Total	Absent--20207PD26-2		N/A		Feb 11, 2002
Feb 06, 2002	1	RT	Total	Absent--20207PD26-1		N/A		Feb 11, 2002
Jan 30, 2002	1	RT	Total	Absent--20131PE46-2		N/A		Feb 04, 2002
Jan 30, 2002	1	RT	Total	Absent--20131PE46-1		N/A		Feb 04, 2002
Jan 23, 2002	1	RT	Total	Absent--020124PB22-2		N/A		Jan 28, 2002
Jan 23, 2002	1	RT	Total	Absent--020124PB22-1		N/A		Jan 28, 2002

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Jan 16, 2002	1	RT	Total	Absent--20117PD27-2		N/A		Jan 22, 2002
Jan 16, 2002	1	RT	Total	Absent--20117PD27-1		N/A		Jan 22, 2002
Jan 09, 2002	1	RT	Total	Absent--20110PD24-2		N/A		Jan 14, 2002
Jan 09, 2002	1	RT	Total	Absent--20110PD24-1		N/A		Jan 14, 2002
Jan 02, 2002	1	RT	Total	Absent--20103PL216-2		N/A		Jan 07, 2002
Jan 02, 2002	1	RT	Total	Absent--20103PL216-1		N/A		Jan 07, 2002
Dec 26, 2001	1	RT	Total	Absent--11227PF27-2		N/A		Jan 07, 2002
Dec 26, 2001	1	RT	Total	Absent--11227PF27-1		N/A		Jan 07, 2002
Dec 19, 2001	1	RT	Total	Absent--11220PE26-2		N/A		Dec 27, 2001
Dec 19, 2001	1	RT	Total	Absent--11220PE26-1		N/A		Dec 27, 2001
Dec 12, 2001	1	RT	Total	Absent--11213PE218-2		N/A		Dec 18, 2001
Dec 12, 2001	1	RT	Total	Absent--11213PE218-1		N/A		Dec 18, 2001
Dec 05, 2001	1	RT	Total	Absent--11206PO210-2		N/A		Dec 10, 2001
Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Dec 05, 2001	1	RT	Total	Absent--11206PO210-1		N/A		Dec 10, 2001
Nov 29, 2001	1	RT	Total	Absent--11130C23-2		N/A		Dec 10, 2001
Nov 29, 2001	1	RT	Total	Absent--11130C23-1		N/A		Dec 10, 2001
Nov 19, 2001	1	RT	Total	Absent--11120PI213-2		N/A		Dec 03, 2001
Nov 19, 2001	1	RT	Total	Absent--11120PI213-1		N/A		Dec 03, 2001
Nov 15, 2001	1	RT	Total	Absent--11116PC23-2		N/A		Nov 23, 2001
Nov 15, 2001	1	RT	Total	Absent--11116PC23-1		N/A		Nov 23, 2001
Nov 07, 2001	1	RT	Total	Absent--11108PF26-2		N/A		Nov 16, 2001
Nov 07, 2001	1	RT	Total	Absent--11108PF26-1		N/A		Nov 16, 2001
Oct 31, 2001	1	RT	Total	Absent--11101PF26-2		N/A		Nov 07, 2001
Oct 31, 2001	1	RT	Total	Absent--11101PF26-1		N/A		Nov 07, 2001
Oct 24, 2001	1	RT	Total	Absent--11025PF26-2		N/A		Oct 30, 2001
Oct 24, 2001	1	RT	Total	Absent--11025PF26-1		N/A		Oct 30, 2001
Oct 17, 2001	1	RT	Total	Absent--11018PK219-2		N/A		Oct 22, 2001
Oct 17, 2001	1	RT	Total	Absent--11018PK219-1		N/A		Oct 22, 2001
Oct 10, 2001	1	RT	Total	Absent--11011PG213-2		N/A		Oct 15, 2001
Oct 10, 2001	1	RT	Total	Absent--11011PG213-1		N/A		Oct 15, 2001
Oct 04, 2001	1	RT	Total	Absent--11004PF210-2		N/A		Oct 09, 2001
Oct 04, 2001	1	RT	Total	Absent--11004PF210-1		N/A		Oct 09, 2001
Sep 26, 2001	1	RT	Total	Absent--10927PI29-2		N/A		Oct 01, 2001
Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Sep 26, 2001	1	RT	Total	Absent--10927PI29-1		N/A		Oct 01, 2001
Sep 19, 2001	1	RT	Total	Absent--10920PD25-2		N/A		Sep 24, 2001
Sep 19, 2001	1	RT	Total	Absent--10920PD25-1		N/A		Sep 24, 2001

Sample Date	# Samples	Coliform Type	Type	Results--ID	Repeat of Sample ID	Sample Site	Cl Residual	Receive Date
Sep 12, 2001	1	RT	Total	Absent--10913PG28-2		N/A		Sep 19, 2001
Sep 12, 2001	1	RT	Total	Absent--10913PG28-1		N/A		Sep 19, 2001
Sep 05, 2001	1	RT	Total	Absent--10906PH211-2		N/A		Sep 13, 2001
Sep 05, 2001	1	RT	Total	Absent--10906PH211-1		N/A		Sep 13, 2001
Aug 22, 2001	1	RT	Total	Absent--10823PK217-2		N/A		Aug 27, 2001
Aug 22, 2001	1	RT	Total	Absent--10823PK217-1		N/A		Aug 27, 2001
Aug 15, 2001	1	RT	Total	Absent--10816PI317-2		N/A		Aug 21, 2001
Aug 15, 2001	1	RT	Total	Absent--10816PI317-1		N/A		Aug 21, 2001
Aug 08, 2001	1	RT	Total	Absent--10809PM220-2		N/A		Aug 14, 2001
Aug 08, 2001	1	RT	Total	Absent--10809PM220-1		N/A		Aug 14, 2001
Aug 01, 2001	1	RT	Total	Absent--10802PI217-2		N/A		Aug 06, 2001
Aug 01, 2001	1	RT	Total	Absent--10802PI217-1		N/A		Aug 06, 2001
Jul 25, 2001	1	RT	Total	Absent--10726PG28-2		N/A		Aug 01, 2001
Jul 25, 2001	1	RT	Total	Absent--10726PG28-1		N/A		Aug 01, 2001
Jul 18, 2001	1	RT	Total	Absent--10719PJ214-2		N/A		Jul 23, 2001
Jul 18, 2001	1	RT	Total	Absent--10719PJ214-1		N/A		Jul 23, 2001
Jul 12, 2001	1	RT	Total	Absent--10713F28-2		N/A		Jul 23, 2001
Jul 12, 2001	1	RT	Total	Absent--10713F28-1		N/A		Jul 23, 2001
Jul 05, 2001	1	RT	Total	Absent--107069PC23-2		N/A		Jul 17, 2001
Jul 05, 2001	1	RT	Total	Absent--107069PC23-1		N/A		Jul 17, 2001

Click here to show results prior to

Recent Batch Numbers

Oregon Department of Human Services

Drinking Water Program

MILTON-FREEWATER, CITY OF

PWS #: 00522 *System Status:* Active *System Type:* C *Population:* 6,500

Current Open Coliform Sample Schedule

(subject to change based upon future test results)

7 Routine sample(s) per Month to be taken beginning 01/01/1991 -

(A begin date of 01/01/1991 indicates the year the Total Coliform Rule was established)

Community and Non-transient Non-community water systems that use chlorine or chloramines must measure the residual disinfectant level at the same points in the distribution system and at the same time when total coliforms are sampled.

Repeat, Temporary Routine, and Prior Coliform Sample Schedules

sample(s) -

Instructions and Notes

1) If no prior sample schedules appear, then no prior schedules exist within the database.

2) Schedules for water systems that are classified as "NP" (State Regulated) may not appear. If the system is active, the system must sample and test for the presence of coliform bacteria with a frequency of 1 sample per quarter (1 sample per month for those systems with a surface water source or a groundwater source determined to be under the influence of surface water). If the sample tests positive for the presence of total or fecal coliform or E-Coli, a minimum of 4 repeat samples must be taken. 5 routine samples must then be taken the following month. If these 5 samples test negative for the presence of coliform bacteria, the system may return to a quarterly sample schedule beginning with the next quarter (e.g. a routine quarterly sample tests positive in January, 4 repeats need to be taken within 24 hours following the positive sample, 5 routine samples need to be taken in February and if none of these samples tests positive, the system can go back on a quarterly schedule beginning April 1st).

In any case, as soon as a sample tests positive for the presense of coliform bacteria, the system should contact the Department of Human Services at 971-673-0405 and ask to speak with the person handling phone duty for the Drinking Water Program.

For further information on this public water system click on the area of interest below.

System Info :: Report for Lenders :: Alerts :: Violations :: Enforcements :: Contacts :: Site Visits :: Public Notice
Coliform Summary :: Coliform Results :: Coliform Results Archives (pre 2002) :: Sampling Schedule for Coliform
Chemical Group Summary :: Latest Chemical Results :: Chemical Detections :: Sampling Schedules for Chemicals
Single Analyte Results For a System :: Lead & Copper :: Corrosion Control(LCR) :: SWTR :: Nitrates :: Arsenic
DBPs :: TOC & Alkalinity :: DBP/TOC/Bromate/Chlorine Monitoring :: Radionuclides :: FANLs :: MRDL :: Plan Review

Information by county:
Inventory :: Surface Water Systems :: Water System Surveys :: Alerts :: Violations :: Open Enforcements :: Cross Connection ASRs

Inventory List for all Oregon Drinking Water Systems in Excel or printable screen format
SNC Reports for Oregon Drinking Water Systems

Oregon Department of Human Services

Drinking Water Program

PWSID: 00522
PWSName: MILTON-FREEWATER, CITY OF
Status: A
System Type: C
Population: 6500

Fact Sheets
Definitions
Public Notice
Alerts
Enforcements
Spreadsheet

Action Levels: Lead = 0.0155 mg/l Copper = 1.35 mg/l

Lead and Copper 90th Percentile Results

Sample Date	Date Received	Round	Sample Count	Duration	Lead (mg/l)	Copper (mg/l)
Jul 11, 2007	Aug 03, 2007	0008	20	3Y	0.0020	0.0810
Jun 22, 2004	Jul 20, 2004	0007	20	3Y	0.0020	0.0600
Sep 05, 2001	Oct 11, 2001	0006	20	3Y	0.0020	0.0910
Mar 04, 1998	Apr 09, 1998	0005	20	YR	0.0010	0.1400
Aug 14, 1996	Mar 05, 1997	0004	20	YR	0.0014	0.0580
Sep 06, 1995	Oct 10, 1995	0003	20	YR	0.0000	0.0600
Jul 01, 1993	Apr 22, 1993	0002	40	6M	0.0050	0.1200
Jan 11, 1993	Feb 11, 1993	0001	40	6M	0.0010	0.1000

More Info

For further information on this public water system click on the area of interest below.

System Info :: Report for Lenders :: Alerts :: Violations :: Enforcements :: Contacts :: Site Visits :: Public Notice
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Chemical Group Summary :: Latest Chemical Results :: Chemical Detections :: Sampling Schedules for Chemicals
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DBPs :: TOC & Alkalinity :: DBP/TOC/Bromate/Chlorine Monitoring :: Radionuclides :: FANLs :: MRDL :: Plan Review

Information by county:
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Inventory List for all Oregon Drinking Water Systems in Excel or printable screen format
SNC Reports for Oregon Drinking Water Systems

Oregon Department of Human Services

Drinking Water Program

ND = Not Detected at the Minimum Reporting Level Spreadsheet

Nitrate Samples - PWS ID: 00522 ---- MILTON-FREEWATER, CITY OF

Sample ID	Sample Date	Receive Date	Analyte Name	Source Name	Source ID	Results	MCL	UOM
A71024B3	10/23/07	11/05/07	NITRATE (AS N)	EP FOR WELLFIELD (WELLS #1 & #2)	EP-A	ND	10.0000	MG/L
A71024B4	10/23/07	11/05/07	NITRATE (AS N)	EP FOR WELLFIELD (WELLS #3,#5 & #6)	EP-B	ND	10.0000	MG/L
A71024B1	10/23/07	11/05/07	NITRATE (AS N)	EP FOR WELL #8	EP-C	ND	10.0000	MG/L
A71024B2	10/23/07	11/05/07	NITRATE (AS N)	EP FOR WELL #9	EP-D	ND	10.0000	MG/L
A60804D1	08/03/06	08/22/06	NITRATE (AS N)	EP FOR WELLFIELD (WELLS #1 & #2)	EP-A	ND	10.0000	MG/L
A60804D2	08/03/06	08/22/06	NITRATE (AS N)	EP FOR WELLFIELD (WELLS #3,#5 & #6)	EP-B	0.8000000	10.0000	MG/L
A60804D3	08/03/06	08/22/06	NITRATE (AS N)	EP FOR WELL #8	EP-C	ND	10.0000	MG/L
A60804D4	08/03/06	08/22/06	NITRATE (AS N)	EP FOR WELL #9	EP-D	ND	10.0000	MG/L
A50914AQ-1	09/13/05	01/10/06	NITRATE (AS N)	EP FOR WELLFIELD (WELLS #1 & #2)	EP-A	ND	10.0000	MG/L
A50914AO-1	09/13/05	12/07/05	NITRATE (AS N)	EP FOR WELL #8	EP-C	0.3000000	10.0000	MG/L
A50914AY-1	09/13/05	01/10/06	NITRATE (AS N)	EP FOR WELL #9	EP-D	ND	10.0000	MG/L
A41117AP-2	11/16/04	12/01/04	NITRATE (AS N)	EP FOR WELLFIELD (WELLS #1 & #2)	EP-A	ND	10.0000	MG/L
A41117AP-3	11/16/04	12/01/04	NITRATE (AS N)	EP FOR WELLFIELD (WELLS #1 & #2)	EP-A	ND	10.0000	MG/L
A41117AP-4	11/16/04	12/01/04	NITRATE (AS N)	EP FOR WELLFIELD (WELLS #3,#5 & #6)	EP-B	1.6000000	10.0000	MG/L
A41117AP-5	11/16/04	12/01/04	NITRATE (AS N)	EP FOR WELLFIELD (WELLS #3,#5 & #6)	EP-B	0.2000000	10.0000	MG/L
A41117AP-65	11/16/04	12/01/04	NITRATE (AS N)	EP FOR WELLFIELD (WELLS #3,#5 & #6)	EP-B	0.4000000	10.0000	MG/L
A41117AP-1	11/16/04	12/01/04	NITRATE (AS N)	EP FOR WELL #9	EP-D	ND	10.0000	MG/L
A31009E-4	10/08/03	10/27/03	NITRATE (AS N)	EP FOR WELLFIELD (WELLS #1 & #2)	EP-A	ND	10.0000	MG/L
A31009E-5	10/08/03	10/27/03	NITRATE (AS N)	EP FOR WELLFIELD (WELLS #1 & #2)	EP-A	0.7000000	10.0000	MG/L
A31009E-6	10/08/03	10/27/03	NITRATE (AS N)	EP FOR WELLFIELD (WELLS #3,#5 & #6)	EP-B	ND	10.0000	MG/L
A31009E-3	10/08/03	10/27/03	NITRATE (AS N)	EP FOR WELLFIELD (WELLS #3,#5 & #6)	EP-B	0.7000000	10.0000	MG/L
A31009E-1	10/08/03	10/27/03	NITRATE (AS N)	EP FOR WELL #8	EP-C	ND	10.0000	MG/L
A31009E-2	10/08/03	10/27/03	NITRATE (AS N)	EP FOR WELL #9	EP-D	ND	10.0000	MG/L
A21205S-1I	12/04/02	12/30/02	NITRATE (AS N)	EP FOR WELL #8	EP-C	ND	10.0000	MG/L
A21205S-1I	12/04/02	12/30/02	NITRATE+NITRITE (AS N)	EP FOR WELL #8	EP-C	ND	10.0000	MG/L

A212050-1I	12/04/02	12/30/02	NITRATE (AS N)	EP FOR WELL #9	EP-D	ND	10.0000	MG/L
A212050-1I	12/04/02	12/30/02	NITRATE+NITRITE (AS N)	EP FOR WELL #9	EP-D	ND	10.0000	MG/L
A20724B-1I	07/23/02	08/29/02	NITRATE (AS N)	EP FOR WELLFIELD (WELLS #1 & #2)	EP-A	ND	10.0000	MG/L
A20724B-1I	07/23/02	08/29/02	NITRATE+NITRITE (AS N)	EP FOR WELLFIELD (WELLS #1 & #2)	EP-A	ND	10.0000	MG/L
A20724A-1I	07/23/02	08/29/02	NITRATE (AS N)	EP FOR WELLFIELD (WELLS #3,#5 & #6)	EP-B	0.8400000	10.0000	MG/L
A20724A-1I	07/23/02	08/29/02	NITRATE+NITRITE (AS N)	EP FOR WELLFIELD (WELLS #3,#5 & #6)	EP-B	0.8400000	10.0000	MG/L
A20724C-1I	07/23/02	10/04/02	NITRATE (AS N)	EP FOR WELL #8	EP-C	ND	10.0000	MG/L
A20724C-1I	07/23/02	10/04/02	NITRATE+NITRITE (AS N)	EP FOR WELL #8	EP-C	ND	10.0000	MG/L
A20724D-1I	07/23/02	08/29/02	NITRATE (AS N)	EP FOR WELL #9	EP-D	ND	10.0000	MG/L
A20724D-1I	07/23/02	08/29/02	NITRATE+NITRITE (AS N)	EP FOR WELL #9	EP-D	ND	10.0000	MG/L

Archived Nitrate Samples - PWS ID: 00522

Sample Date	Receive Date	Analyte Name	Source Name	Source ID	Results	MCL
08/29/01	09/19/01	Nitrate	WELL #1	AA	1.2000000	10.0000
08/29/01	09/19/01	Nitrate	WELL #2	AB	1.2000000	10.0000
08/29/01	09/19/01	Nitrate	WELL #3	BA	1.3000000	10.0000
08/29/01	09/19/01	Nitrate	WELL #5	BB	1.2000000	10.0000
08/29/01	09/19/01	Nitrate	WELL #6	BC	1.8000000	10.0000
08/29/01	09/24/01	Nitrate	ENTRY POINT - WELL #8	C	1.3000000	10.0000
08/29/01	09/24/01	Nitrate	EP FOR WELL #9	D	1.2000000	10.0000
12/05/00	12/18/00	Nitrate	WELL #1	AA	0.3000000	10.0000
12/05/00	12/18/00	Nitrate	WELL #3	BA	2.0000000	10.0000
12/05/00	12/18/00	Nitrate	WELL #5	BB	0.9000000	10.0000
12/05/00	12/18/00	Nitrate	WELL #6	BC	1.2000000	10.0000
12/05/00	12/18/00	Nitrate	WELL #8 - COUSE CREEK ROAD	CA	0.4000000	10.0000
12/05/00	12/18/00	Nitrate	WELL #9	DA	0.4000000	10.0000
11/03/99	11/23/99	Nitrate	WELL #1	AA	ND	10.0000
11/03/99	11/26/99	Nitrate	WELL #2	AB	0.0400000	10.0000
11/03/99	11/26/99	Nitrate	WELL #3	BA	0.2700000	10.0000
11/03/99	12/09/99	Nitrate	WELL #5	BB	0.5800000	10.0000
11/03/99	11/23/99	Nitrate	WELL #6	BC	0.5700000	10.0000
11/03/99	11/23/99	Nitrate	WELL #8 - COUSE CREEK ROAD	CA	ND	10.0000
04/22/99	06/11/99	Nitrate	WELL #9	DA	0.2000000	10.0000
02/11/98	03/05/98	Nitrate	WELL #1	AA	ND	10.0000
02/11/98	03/05/98	Nitrate	WELL #2	AB	0.0100000	10.0000
02/11/98	03/05/98	Nitrate	WELL #5	BB	1.3000000	10.0000
02/11/98	03/05/98	Nitrate	WELL #6	BC	3.2000000	10.0000

02/11/98	03/05/98	Nitrate	WELL #8 - COUSE CREEK ROAD	CA	ND	10.0000
05/22/96	07/24/96	Nitrate	WELL #1	AA	0.7600000	10.0000
05/22/96	07/24/96	Nitrate	WELL #2	AB	0.0300000	10.0000
05/22/96	07/24/96	Nitrate	WELL #5	BB	ND	10.0000
05/22/96	07/24/96	Nitrate	WELL #6	BC	0.4000000	10.0000
05/22/96	07/24/96	Nitrate	ENTRY POINT - WELL #8	C	ND	10.0000
05/22/96	07/24/96	Nitrate	WELL #8 - COUSE CREEK ROAD	CA	ND	10.0000
01/04/95	01/31/95	Nitrate	WELL #1	AA	ND	10.0000
01/04/95	01/31/95	Nitrate	WELL #2	AB	0.0200000	10.0000
01/04/95	01/31/95	Nitrate	WELL #5	BB	1.1000000	10.0000
01/04/95	01/31/95	Nitrate	WELL #6	BC	0.3500000	10.0000
01/04/95	01/31/95	Nitrate	WELL #8 - COUSE CREEK ROAD	CA	ND	10.0000
07/28/93	11/09/93	Nitrate	WELL #1	AA	ND	10.0000
07/28/93	11/09/93	Nitrate-Nitrite	WELL #1	AA	ND	10.0000
07/28/93	11/09/93	Nitrate	WELL #2	AB	0.0400000	10.0000
07/28/93	11/09/93	Nitrate-Nitrite	WELL #2	AB	0.0400000	10.0000
07/28/93	11/09/93	Nitrate	WELL #5	BB	0.3200000	10.0000
07/28/93	11/09/93	Nitrate-Nitrite	WELL #5	BB	0.3200000	10.0000
07/28/93	11/10/93	Nitrate	WELL #6	BC	0.3300000	10.0000
07/28/93	11/10/93	Nitrate-Nitrite	WELL #6	BC	0.3300000	10.0000
07/28/93	11/10/93	Nitrate	WELL #8 - COUSE CREEK ROAD	CA	ND	10.0000
07/28/93	11/10/93	Nitrate-Nitrite	WELL #8 - COUSE CREEK ROAD	CA	ND	10.0000
04/14/93	11/30/93	Nitrate	WELL #1	AA	0.0200000	10.0000
04/14/93	11/30/93	Nitrate-Nitrite	WELL #1	AA	0.0200000	10.0000
04/14/93	11/30/93	Nitrate	WELL #2	AB	0.0200000	10.0000
04/14/93	11/30/93	Nitrate-Nitrite	WELL #2	AB	0.0200000	10.0000
04/14/93	11/30/93	Nitrate	WELL #5	BB	0.5000000	10.0000
04/14/93	11/30/93	Nitrate-Nitrite	WELL #5	BB	0.5000000	10.0000
04/14/93	11/30/93	Nitrate	WELL #6	BC	0.3700000	10.0000
04/14/93	11/30/93	Nitrate-Nitrite	WELL #6	BC	0.4000000	10.0000
03/25/92	05/13/92	Nitrate	WELLFIELD (WELLS #1 & #2)	A	ND	10.0000
03/25/92	05/13/92	Nitrate	WELLFIELD (WELLS #3,#5 & #6)	B	1.0000000	10.0000
03/25/92	05/13/92	Nitrate	WELL #8	C	ND	10.0000
06/16/91	07/23/91	Nitrate	WELLFIELD (WELLS #1 & #2)	A	ND	10.0000
06/16/91	07/23/91	Nitrate	WELLFIELD (WELLS #3,#5 & #6)	B	0.7000000	10.0000
06/16/91	07/23/91	Nitrate	WELL #8	C	ND	10.0000

06/20/88	07/06/88	Nitrate	WELLFIELD (WELLS #1 & #2)	A	ND	10.0000
06/20/88	07/06/88	Nitrate	WELLFIELD (WELLS #3,#5 & #6)	B	1.9700000	10.0000
06/20/88	07/06/88	Nitrate	WELL #8	C	ND	10.0000
07/16/85	07/16/85	Nitrate	WELLFIELD (WELLS #1 & #2)	A	0.3800000	10.0000

A blank or a 0 in the MCL column indicates that a MCL has not been set for that chemical.

For further information on this public water system click on the area of interest below.

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Inventory List for all Oregon Drinking Water Systems in Excel or printable screen format
SNC Reports for Oregon Drinking Water Systems

Oregon Department of Human Services

Drinking Water Program

ND = Not Detected at the Minimum Reporting Level Spreadsheet

Arsenic Samples - PWS ID: 00522 ---- MILTON-FREEWATER, CITY OF

Sample ID	Sample Date	Receive Date	Source Name	Source ID	Results	MCL	UOM
A50914AQ-1	09/13/05	01/10/06	EP FOR WELLFIELD (WELLS #1 & #2)	EP-A	ND	0.0500	MG/L
A50914AO-1	09/13/05	12/07/05	EP FOR WELL #8	EP-C	ND	0.0500	MG/L
A50914AY-1	09/13/05	01/10/06	EP FOR WELL #9	EP-D	ND	0.0500	MG/L
A21205S-1I	12/04/02	12/30/02	EP FOR WELL #8	EP-C	ND	0.0500	MG/L
A21205O-1I	12/04/02	12/30/02	EP FOR WELL #9	EP-D	ND	0.0500	MG/L
A20724B-1:	07/23/02	08/29/02	EP FOR WELLFIELD (WELLS #1 & #2)	EP-A	ND	0.0500	MG/L
A20724A-1I	07/23/02	08/29/02	EP FOR WELLFIELD (WELLS #3,#5 & #6)	EP-B	ND	0.0500	MG/L
A20724C-1I	07/23/02	10/04/02	EP FOR WELL #8	EP-C	ND	0.0500	MG/L
A20724D-1I	07/23/02	08/29/02	EP FOR WELL #9	EP-D	ND	0.0500	MG/L

Archived Arsenic Samples - PWS ID: 00522

Sample Date	Receive Date	Source Name	Source ID	Results	MCL
11/03/99	11/23/99	WELL #1	AA	ND	0.0500
11/03/99	11/26/99	WELL #2	AB	0.0002000	0.0500
11/03/99	11/26/99	WELL #3	BA	0.0004000	0.0500
11/03/99	12/09/99	WELL #5	BB	ND	0.0500
11/03/99	11/23/99	WELL #6	BC	ND	0.0500
11/03/99	11/23/99	WELL #8 - COUSE CREEK ROAD	CA	0.0005000	0.0500
04/22/99	06/11/99	WELL #9	DA	ND	0.0500
05/22/96	07/24/96	WELL #1	AA	ND	0.0500
05/22/96	07/24/96	WELL #2	AB	ND	0.0500
05/22/96	07/24/96	WELL #5	BB	ND	0.0500
05/22/96	07/24/96	WELL #6	BC	ND	0.0500
05/22/96	07/24/96	ENTRY POINT - WELL #8	C	ND	0.0500
05/22/96	07/24/96	WELL #8 - COUSE CREEK ROAD	CA	ND	0.0500
07/28/93	11/09/93	WELL #1	AA	ND	0.0500
07/28/93	11/09/93	WELL #2	AB	ND	0.0500

07/28/93	11/09/93	WELL #5	BB	ND	0.0500
07/28/93	11/10/93	WELL #6	BC	ND	0.0500
07/28/93	11/10/93	WELL #8 - COUSE CREEK ROAD	CA	ND	0.0500
04/14/93	11/30/93	WELL #1	AA	ND	0.0500
04/14/93	11/30/93	WELL #2	AB	ND	0.0500
04/14/93	11/30/93	WELL #5	BB	ND	0.0500
04/14/93	11/30/93	WELL #6	BC	ND	0.0500
03/25/92	05/13/92	WELLFIELD (WELLS #1 & #2)	A	ND	0.0500
03/25/92	05/13/92	WELLFIELD (WELLS #3,#5 & #6)	B	ND	0.0500
03/25/92	05/13/92	WELL #8	C	ND	0.0500
06/16/91	07/23/91	WELLFIELD (WELLS #1 & #2)	A	ND	0.0500
06/16/91	07/23/91	WELLFIELD (WELLS #3,#5 & #6)	B	ND	0.0500
06/16/91	07/23/91	WELL #8	C	ND	0.0500
06/20/88	07/06/88	WELLFIELD (WELLS #1 & #2)	A	ND	0.0500
06/20/88	07/06/88	WELLFIELD (WELLS #3,#5 & #6)	B	ND	0.0500
07/16/85	07/16/85	WELLFIELD (WELLS #1 & #2)	A	ND	0.0500

A blank or a 0 in the MCL column indicates that a MCL has not been set for that chemical.

For further information on this public water system click on the area of interest below.

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ASRs

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SNC Reports for Oregon Drinking Water Systems

Oregon Department of Human Services

Drinking Water Program

ND = Not Detected at the Minimum Reporting Level; Spreadsheet - = Not Sampled

Disinfection By-product Monitoring - PWS ID: 00522 = MILTON-FREEWATER, CITY OF

Sample ID	Sample Date	Receive Date	Source ID	TTHM mg/L MCL = 0.08	HAA5 mg/L MCL = 0.06	Bromate mg/L
A71022A1	10/22/07	12/07/07	DIST-A	ND	ND	-
A71022A2	10/22/07	12/07/07	DIST-A	0.0011000	ND	-
A71022A3	10/22/07	12/07/07	DIST-A	0.0007000	ND	-
A71022A4	10/22/07	12/06/07	DIST-A	0.0010000	ND	-
A40908BR-01	09/07/04	10/13/04	DIST-A	ND	0.0006000	-
A40908BR-02	09/07/04	10/13/04	DIST-A	ND	0.0007000	-

For further information on this public water system click on the area of interest below.

System Info :: Report for Lenders :: Alerts :: Violations :: Enforcements :: Contacts :: Site Visits :: Public Notice
Coliform Summary :: Coliform Results :: Coliform Results Archives (pre 2002) :: Sampling Schedule for Coliform
Chemical Group Summary :: Latest Chemical Results :: Chemical Detections :: Sampling Schedules for Chemicals
Single Analyte Results For a System :: Lead & Copper :: Corrosion Control(LCR) :: SWTR :: Nitrates :: Arsenic
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SNC Reports for Oregon Drinking Water Systems

DWP Outreach Plan

PWS ID: 00522 ---- MILTON-FREEWATER, CITY OF

- **Disinfectant Byproducts (DBP)**
- **Total Organic Carbon (TOC)**
- **Bromate**
- **Chlorine(MRDL) Monitoring and Results**

DBP

Applicability

DBP Monitoring applies to Community Water Systems and Non-Transient Non-Community water systems that add a chemical disinfectant (excluding U/V disinfection) to their water or that purchase from a system that adds a chemical disinfectant.

Description

Disinfectant Byproducts (DBPs) include Total Trihalomethanes (TTHM) and Haloacetic Acids (HAA5). These byproducts are formed when chemical disinfectants react with organic compounds (such as TOC). DBPs are a health concern because they may cause cancer, as well as liver, kidney, and central nervous system problems.

Monitoring

DBP Monitoring applies to Community Water Systems and Non-Transient Non-Community water systems that add a chemical disinfectant (excluding U/V disinfection) to their water or that purchase from a system that adds a chemical disinfectant. Monitoring is summarized in the table below:

Monitoring for Total Trihalomethanes & Haloacetic Acids

System Type	Routine Monitoring	Reduced Monitoring
Surface Water with Population 10,000 & Up	4 Samples per Plant per Quarter	1 Sample per Plant per Quarter
Surface Water with Population 500 – 9,999	1 Sample per Plant per Quarter	1 Sample per Plant per Year
Surface Water with Population less than 500	1 Sample per Plant per Year	No reduction
Groundwater with Population 10,000 & Up	1 Sample per Plant per Quarter	1 Sample per Plant per Year
Groundwater with Population less than 10,000	1 Sample per Plant per Year	1 Sample per Plant per 3 Year Cycle (Jan 1 – Dec 31)

Note: Surface water systems are eligible for reduced monitoring frequency when both DBP levels are ≤ to 50% of the MCL and monthly source water TOC running annual average is < 4.0 mg/l. (Once on reduced DBP monitoring, source water TOC can be reduced to quarterly.) Groundwater systems are eligible for reduced monitoring based on disinfection byproduct monitoring alone. A "Plant" can be a treatment facility, entry point, well, or a wellfield and is the point at which a disinfectant is added (refer to your water system info page to view a list of your active treatment plants and which plants include adding a disinfectant as a treatment process).

Monitoring schedules for your particular system will be available in the coming months.

Sample Points

Sample sites for your water system are listed below. DBPMAX refers to the point of maximum residence time in the distribution system and generally, this is the point farthest from the point of disinfection. DBP without the "MAX" designation refers to points within the distribution that represent an average disinfectant level.

DBP Sample Points for PWS ID: 00522 ---- MILTON-FREEWATER, CITY OF

Sample Point ID	Location
DBPMAX01	1014 S MAIN ST
DBPMAX02	501 LAMB ST
DBPMAX03	217 E BROADWAY
DBPMAX04	CITY HALL

Results
All Results will be entered and taken into consideration when setting monitoring schedules and will be available in the coming months.

Maximum Contaminant Levels

Disinfection Byproduct	Maximum Contaminant Level (mg/l)
Total Trihalomethanes (TTHM)	0.080 as a Running Annual Average
Haloacetic Acids (five) (HAA5)	0.060 as a Running Annual Average

Determining Compliance with the Maximum Contaminant Levels
A running annual average is the arithmetic average of results and is calculated at the end of every quarter for the previous consecutive four-quarter period. Compliance is achieved when the running annual average of TTHM results are less than 0.080 mg/L and the running annual average of HAA5 results are below 0.060 mg/L.

Fact Sheets
Trihalomethanes Health Effects (PDF)
Quick Reference Guide (2 pages) (PDF)
General M-DBP Fact Sheet (5 pages) (PDF)
Stage 1 DBPR Fact Sheet (4 pages) (PDF)
EPA Microbial and Disinfectant Byproduct Rules Simultaneous Compliance Guidance Manual (150 pages) (PDF)
Flow Chart For Surface Water or Groundwater Under the Influence of Surface Water Sources (PDF)

Educational
Stage 1 Disinfection Byproduct Monitoring (PowerPoint presentation)

TOC

Applicability
TOC monitoring applies to Community and Non-Transient Non-Community systems using surface water or groundwater under the direct influence of surface water and that add a chemical disinfectant and use conventional filtration (2.5-log) or softening. Monitoring also applies to any system seeking a reduction in DBP monitoring, but does not meet the applicability requirements described above, however, only raw water TOC sampling applies in this case.

NOT REQUIRED
(Raw TOC monitoring must be done quarterly by surface water systems on reduced DBP monitoring)

MILTON-FREEWATER, CITY OF (PWS ID: #00522)
Is not required to sample Raw water TOC, raw water Alkalinity, and Filtered Water TOC

Description
Total Organic Carbon (TOC) is naturally found in water and can react with disinfectants to produce DBPs. Reduction of TOC limits the formation of DBPs.

Monitoring
Community and Non-Transient Non-Community Systems

For Surface Systems with Conventional Treatment Plants (2.5-log) Only

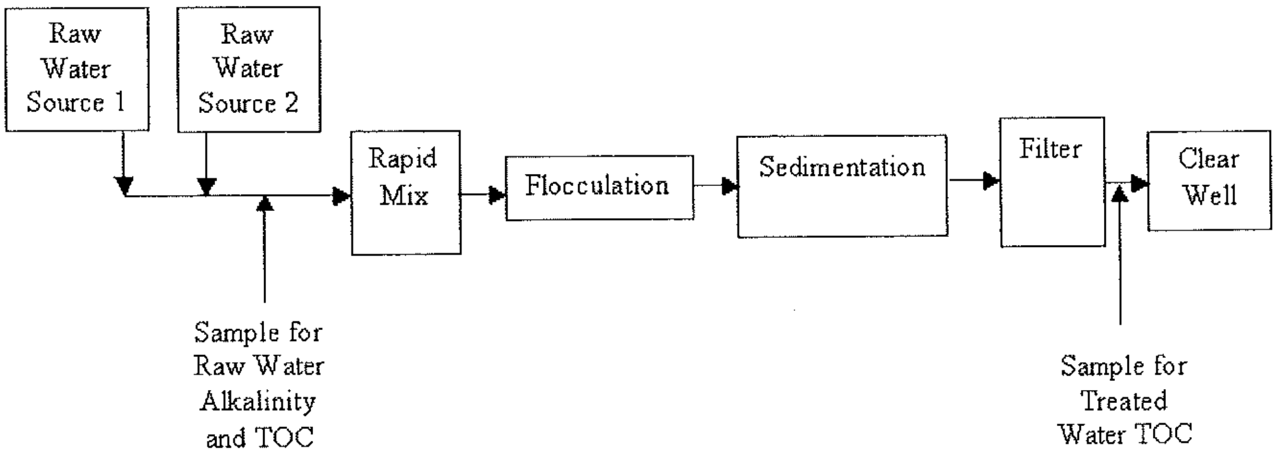
Parameter	Routine Monitoring	Reduced Monitoring
Raw water TOC	1 Sample per month	1 Sample per quarter
Filtered water TOC	1 Sample per month	1 Sample per quarter
Raw water alkalinity	1 Sample per month	1 Sample per quarter

Note: Water systems are eligible for reduced monitoring frequency when the average treated TOC for 1 year is < 1.0 mg/l or the average treated TOC for 2 years is < 2.0 mg/l.

Sampling for both raw and filtered water parameters should occur on the same day.

Monitoring schedules for your particular system will be available in the coming months.

Sample Points
Sample sites for your water system should include a site at the raw water source coming into the treatment plant and the combined filter effluent. Example:



Results
All Results will be entered and taken into consideration when setting monitoring schedules and will be available in the coming months.

Minimum Treatment Technique Required (Equivalent to Maximum Contaminant Level)
The Minimum Treatment Technique Required is based on whether enhanced coagulation is required and on a ratio of the percent of TOC actually removed to the percent of TOC that should have been removed.

The running annual average of ratios must be greater than or equal to 1.00 (i.e. the amount of TOC that was actually removed must be equal to or greater than the TOC that should have been removed). A running annual average is the arithmetic average of a year's worth of monthly TOC results and is calculated at the end of every quarter.

Determining Compliance with the Minimum Treatment Technique Required
Compliance is based upon if you need enhanced coagulation. Answer the following six questions in the order that they are listed to determine if you need enhanced coagulation. (If you answer any of the questions with "Yes", you do not need to answer the rest of the questions).

Question #	Question	Answer (Yes/No)
1	Is the current Raw Water Running Annual Average (RAA) TOC (the average of the prior 12 months worth of raw water TOC data) less than or equal to 2.0 mg/L?	
2	Is the Filtered Water RAA TOC (average of the prior 12 months worth of combined filter effluent TOC data) less than or equal to 2.0 mg/L?	
3	Is the current Raw Water RAA TOC ≤ 4.0 mg/L, and the current Raw Water RAA Alkalinity > 60 mg/L, and the current RAA for HAA5 ≤ .030 mg/L, and the current RAA for TTHM ≤ .040 mg/L?	
4	Is Chlorine the only disinfectant used and is the current RAA for HAA5 ≤ .030 mg/L and current RAA for TTHM ≤ .040 mg/L?	
5	If you conduct source water specific UV light absorbance (SUVA) monitoring, is the current RAA SUVA < 2.0 L/mg-m? (your answer should be "No" if you do not conduct this monitoring)	
6	If you conduct filtered water SUVA monitoring, is the current RAA SUVA < 2.0 L/mg-m? (your answer should be "No" if you do not conduct this	

	monitoring)	

***If you answered "Yes" to any of the previous six questions**, you are qualified to opt out of enhanced coagulation and you will not need to comply with the Minimum Treatment Technique Requirements (i.e. you do not need to use the Minimum Treatment Technique Requirement Compliance Calculations described below), however, the monitoring requirements still apply and all results must still be submitted to the Drinking Water Program.*

***If you did not answer "Yes" to any of the six questions**, you cannot opt out of enhanced coagulation and compliance is based on a ratio of the percent of TOC actually removed to the percent of TOC that should have been removed. Use the following compliance calculations to determine compliance with the Minimum Treatment Technique Requirement:*

Minimum Treatment Technique Requirement Compliance Calculations
In order to achieve compliance, the running annual average of the ratio of the percent of TOC actually removed to the percent of TOC that should have been removed must be greater than or equal to 1.00 (i.e. the amount of TOC that was actually removed must be equal to or greater than the TOC that should have been removed). A running annual average is the arithmetic average of results and is calculated at the end of every quarter.

Where
TOC Actually Removed = TOC concentration (in mg/L) of raw water before filtration divided by the TOC concentration (in mg/L) of the combined filter effluent water.

TOC that should have been removed is based on the raw water TOC and the raw water alkalinity according to the following:

Source Water TOC (mg/l)	Source Water Alkalinity, mg/l as $CaCO_3$		
	0 - 60	61 - 120	> 120*
> 2.0 – 4.0	35.0%	25.0%	15.0%
> 4.0 – 8.0	45.0%	35.0%	25.0%
> 8.0	50.0%	40.0%	30.0%

* Systems using enhanced softening must use the TOC removal percentages in this column.

Example: if the raw water alkalinity = 65 mg/L and the raw water TOC = 9.0 mg/L, then the required removal percentage = 40.0%.

Note: It is important to recognize that this percentage can change from month to month depending on the actual raw water TOC and Alkalinity.

Example:

Calculations to Determine Compliance with the Required Removal Ratio of 1.00

Source of Data	Parameter	Results
Raw Water Sampling Data	Source (Raw) Water Alkalinity	65 mg/L
Raw Water Sampling Data	Raw Water TOC	9.0 mg/L
Table of Required Removal Percentages (shown above)	Required Removal Percentage	40.0%
Treated Water Sampling Data	Treated Water TOC	4.0 mg/L
Calculated as Shown	TOC Removed (Raw Water TOC – Treated Water TOC)	9.0 – 4.0 = 5.0 mg/L
Calculated as Shown	Actual Removal Percentage (TOC Removed/Raw Water TOC)	5.0 / 9.0 = 0.556 (or 55.6%)
Calculated as Shown	Calculation of Removal Ratio (Actual Removal Percentage / Required Removal Percentage)	55.6 / 40.0 = 1.39
Calculated as Shown	Ultimate Removal Ratio	1.39 (which is greater than 1.00 therefore, compliance is achieved)

Bromate

Applicability
Bromate monitoring applies to Community and Non-Transient Non-Community systems using ozone as a disinfectant or oxidant.

Description
Bromate is disinfectant byproduct that is formed when ozone is used as a disinfectant in the presence of bromide, which is a naturally occurring element found in ground and surface water sources. Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer.

Monitoring

Monitoring for Bromate for Systems Using Ozone

Location	Routine Monitoring	Reduced Monitoring
Entry Point for the WTP with Ozone	1 Sample per Month	1 Sample per Quarter

Note: Water systems are eligible for reduced monitoring frequency when the average source water bromide concentration is < 0.05 mg/l based on monthly bromide samples for one year and verified as a running annual average that is computed quarterly after the initial year.

Monitoring schedules for your particular system will be available in the coming months.

Sample Points
Sampling for your water system should be at the entry point to the distribution system.

Results
All Results will be entered and taken into consideration when setting monitoring schedules and will be available in the coming months.

Maximum Contaminant Level
The maximum contaminant level for Bromate is 0.010 mg/L.

Determining Compliance with the Maximum Contaminant Level
Compliance with the MCL is based on a running annual average. A running annual average is the arithmetic average of results and is calculated at the end of every quarter.

Chlorine Residual Disinfectant Level

Applicability
Chlorine Residual monitoring is applicable to all Community and Non-Transient Non-Community water systems that use chlorine or chloramines as a disinfectant.

Description
Chlorine is a disinfectant that is used to control microbes. Some people who use water containing chlorine well in excess of the Maximum Residual Disinfectant Level could experience irritating effects to their eyes and nose and could experience stomach discomfort and anemia.

Monitoring
Systems must monitor for chlorine and chloramines every time they sample for total coliform - this includes repeat sampling.

Sample Points
Samples must be taken at the same location in the distribution system as those locations used for total coliform sampling. This is a separate requirement from the daily monitoring and recording of the disinfectant residual.

Results
Results may be submitted on the coliform sampling form (or on the coliform sampling summary forms) that each system currently uses. All Results will be entered and taken into consideration when setting monitoring schedules and will be available in the coming

months. Schedules will reflect the current coliform monitoring schedules already available on-line at the following link located at the bottom of your water system's info page:Sampling Schedule-Coliform

Maximum Residual Disinfectant Level (MRDL)
The MRDL for chlorine is 4.0 mg/L (measured as free chlorine).

Determining Compliance with the MRDL
Compliance with the MRDL is based on a running annual average of monthly averages. Any running annual average that exceeds the MRDL is a violation.

For further information on this public water system click on the area of interest below.

Oregon Department of Human Services

Drinking Water Program

ND = Not Detected at the Minimum Reporting Level; View Gross Alpha, Radium, & Uranium Spreadsheet

Radionuclide Samples - PWS ID: 00522 ---- MILTON-FREEWATER, CITY OF

Sample ID	Sample Date	Receive Date	Chemical	Source ID	Results	MCL	UOM
H45XQ	05/09/06	01/14/08	GROSS ALPHA, EXCLDNG RN & U (EPA 4000)	EP-A	ND	15.0000	pCi
H45X0	05/09/06	01/14/08	GROSS ALPHA, EXCLDNG RN & U (EPA 4000)	EP-A	ND	15.0000	pCi
H45XQ	05/09/06	01/14/08	RADIUM, COMBINED (226, 228) (EPA 4010)	EP-A	ND	5.0000	pCi
H45X0	05/09/06	01/14/08	RADIUM, COMBINED (226, 228) (EPA 4010)	EP-A	0.8600000	5.0000	pCi
H45XQ	05/09/06	01/14/08	URANIUM, COMBINED (EPA 4006)	EP-A	0.0001100	0.0300	MG/L
H45X0	05/09/06	01/14/08	URANIUM, COMBINED (EPA 4006)	EP-A	0.0001200	0.0300	MG/L
H450A	05/09/06	01/14/08	GROSS ALPHA, EXCLDNG RN & U (EPA 4000)	EP-B	ND	15.0000	pCi
H450A	05/09/06	01/14/08	RADIUM, COMBINED (226, 228) (EPA 4010)	EP-B	0.8800000	5.0000	pCi
H450A	05/09/06	01/14/08	URANIUM, COMBINED (EPA 4006)	EP-B	ND	0.0300	MG/L

Archived Results

Sample Date	Receive Date	Chemical	Source ID	Results	MCL
10/25/99	11/29/99	Gross Alpha, Excl. Radon & U	DA	ND	15.0000
02/11/98	03/23/98	Gross Alpha, Excl. Radon & U	AA	ND	15.0000
02/11/98	03/23/98	Gross Alpha, Excl. Radon & U	AB	ND	15.0000
02/11/98	03/23/98	Gross Alpha, Excl. Radon & U	BB	ND	15.0000
02/11/98	03/23/98	Gross Alpha, Excl. Radon & U	BC	ND	15.0000
02/11/98	03/23/98	Gross Alpha, Excl. Radon & U	CA	ND	15.0000
08/30/92	11/25/92	Gross Alpha, Excl. Radon & U	A	ND	15.0000
08/29/88	10/21/88	Gross Alpha, Excl. Radon & U	A	ND	15.0000
08/29/88	10/21/88	Gross Alpha, Excl. Radon & U	B	ND	15.0000

A blank or a 0 in the MCL column indicates that a MCL has not been set for that chemical.

For further information on this public water system click on the area of interest below.

System Info :: Report for Lenders :: Alerts :: Violations :: Enforcements :: Contacts :: Site Visits :: Public Notice
Coliform Summary :: Coliform Results :: Coliform Results Archives (pre 2002) :: Sampling Schedule for Coliform
Chemical Group Summary :: Latest Chemical Results :: Chemical Detections :: Sampling Schedules for Chemicals
Single Analyte Results For a System :: Lead & Copper :: Corrosion Control(LCR) :: SWTR :: Nitrates :: Arsenic
DBPs :: TOC & Alkalinity :: DBP/TOC/Bromate/Chlorine Monitoring :: Radionuclides :: FANLs :: MRDL :: Plan Review

Information by county:

Inventory :: Surface Water Systems :: Water System Surveys :: Alerts :: Violations :: Open Enforcements :: Cross Connection
ASRs

Inventory List for all Oregon Drinking Water Systems in Excel or printable screen format
SNC Reports for Oregon Drinking Water Systems

Oregon Department of Human Services

Drinking Water Program

Facility Analyte Levels - PWS ID: 00522 ---- MILTON-FREEWATER, CITY OF

Spreadsheet

source	startDate	endDate	controlLevel	measure	uom	analyte	analyteCode	mdbpFlag
Distribution System	01/01/2004		MAX	0.0600000	MG/L	TOTAL HALOACETIC ACIDS (HAA5)	2456	
Distribution System	01/01/2004		MAX	0.0800000	MG/L	TOTAL TRIHALOMETHANES (TTHM)	2950	
Distribution System	01/01/2004		MAX	4.0000000	MG/L	CHLORINE	0999	Y

For further information on this public water system click on the area of interest below.

System Info :: Report for Lenders :: Alerts :: Violations :: Enforcements :: Contacts :: Site Visits :: Public Notice

Coliform Summary :: Coliform Results :: Coliform Results Archives (pre 2002) :: Sampling Schedule for Coliform

Chemical Group Summary :: Latest Chemical Results :: Chemical Detections :: Sampling Schedules for Chemicals

Single Analyte Results For a System :: Lead & Copper :: Corrosion Control(LCR) :: SWTR :: Nitrates :: Arsenic

DBPs :: TOC & Alkalinity :: DBP/TOC/Bromate/Chlorine Monitoring :: Radionuclides :: FANLs :: MRDL :: Plan Review

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Inventory :: Surface Water Systems :: Water System Surveys :: Alerts :: Violations :: Open Enforcements :: Cross Connection ASRs

Inventory List for all Oregon Drinking Water Systems in Excel or printable screen format

SNC Reports for Oregon Drinking Water Systems

Oregon Department of Human Services

Drinking Water Program

MRDL

PWS ID: 00522 ---- MILTON-FREEWATER, CITY OF Spreadsheet

Monitoring Period	Received	Entry Point	Samples Required	Samples Collected	Period Avg	Annual Avg	Level Compliance	M&R Compliance
Sep 01, 2007	Oct 17, 2007	DIST-A	7	7	0.2485	0.2313	Y	YES
Aug 01, 2007	Oct 17, 2007	DIST-A	7	10	0.2580	0.2292	Y	YES
Jul 01, 2007	Oct 17, 2007	DIST-A	7	6	0.2366	0.2251	Y	**NMJ**
Jun 01, 2007	Jul 17, 2007	DIST-A	7	8	0.2725	0.2454	Y	YES
May 01, 2007	Jul 17, 2007	DIST-A	7	10	0.1590	0.2421	Y	YES
Apr 01, 2007	Jul 17, 2007	DIST-A	7	8	0.1712	0.2542	Y	YES
Jan 01, 2007	Apr 16, 2007	DIST-A	7	10	0.2830	0.2453	Y	YES
Dec 01, 2006	Mar 12, 2007	DIST-A	7	8	0.2487	0.2375	Y	YES
Nov 01, 2006	Mar 12, 2007	DIST-A	7	10	0.2040	0.2361	Y	YES
Oct 01, 2006	Mar 12, 2007	DIST-A	7	8	0.2500	0.2406	Y	YES
Sep 01, 2006	Mar 12, 2007	DIST-A	7	8	0.2400	0.2391	Y	YES
Aug 01, 2006	Mar 12, 2007	DIST-A	7	10	0.3780	0.2389	Y	YES
Jul 01, 2006	Mar 12, 2007	DIST-A	7	7	0.1500	0.2035	Y	YES
Jun 01, 2006	Mar 12, 2007	DIST-A	7	8	0.2225	0.2218	Y	YES
May 01, 2006	Mar 12, 2007	DIST-A	7	8	0.2300	0.2215	Y	YES

Apr 01, 2006	Mar 12, 2007	DIST-A	7	7	0.2128	0.2128	Y	YES
Mar 01, 2006	Mar 12, 2007	DIST-A	7	8	0.2225	0.2225	Y	YES
Feb 01, 2006	Mar 12, 2007	DIST-A	7	8	0.2925	0.2925	Y	YES
Jan 01, 2006	Mar 12, 2007	DIST-A	7	8	0.2225	0.2225	Y	YES
Dec 01, 2005	May 16, 2006	DIST-A	7	7	0.1000	0.2003	Y	YES
Nov 01, 2005	May 16, 2006	DIST-A	7	8	0.2425	0.2174	Y	YES
Oct 01, 2005	May 16, 2006	DIST-A	7	8	0.1462	0.2124	Y	YES
Sep 01, 2005	May 16, 2006	DIST-A	7	8	0.3700	0.2293	Y	YES
Aug 01, 2005	May 16, 2006	DIST-A	7	8	0.1975	0.1834	Y	YES
Jul 01, 2005	May 16, 2006	DIST-A	7	8	0.1650	0.1763	Y	YES
Jun 01, 2005	May 16, 2006	DIST-A	7	10	0.1880	0.1880	Y	YES
May 01, 2005	May 16, 2006	DIST-A	7	8	0.1325	0.1325	Y	YES
Apr 01, 2005	May 16, 2006	DIST-A	7	10	0.1740	0.1740	Y	YES
Mar 01, 2005	May 16, 2006	DIST-A	7	10	0.2280	0.2280	Y	YES
Feb 01, 2005	May 16, 2006	DIST-A	7	8	0.2425	0.2425	Y	YES
Jan 01, 2005	May 16, 2006	DIST-A	7	8	0.1850	0.1850	Y	YES
Nov 01, 2004	Dec 21, 2004	DIST-A	7	8	0.1875	0.1750	Y	YES

For further information on this public water system click on the area of interest below.

System Info :: Report for Lenders :: Alerts :: Violations :: Enforcements :: Contacts :: Site Visits :: Public Notice
Coliform Summary :: Coliform Results :: Coliform Results Archives (pre 2002) :: Sampling Schedule for Coliform
Chemical Group Summary :: Latest Chemical Results :: Chemical Detections :: Sampling Schedules for

Chemicals

Single Analyte Results For a System :: Lead & Copper :: Corrosion Control(LCR) :: SWTR :: Nitrates :: Arsenic
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Information by county:

Inventory :: Surface Water Systems :: Water System Surveys :: Alerts :: Violations :: Open Enforcements :: Cross Connection
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Inventory List for all Oregon Drinking Water Systems in Excel or printable screen format
SNC Reports for Oregon Drinking Water Systems

APPENDIX B

Drinking Water Program
Sanitary Survey Information

Oregon
Theodore R. Kulongoski, Governor

Department of Human Services
Public Health Division
Drinking Water Program
700 SE Emigrant, Rm. 240
Pendleton, OR 97801
(541) 276-8006
FAX (541) 276-4778

RECEIVED
JAN 2 0 2009
BY:

DHS
Oregon Department of Human Services

January 16, 2009

Dave Bradshaw
City of Milton-Freewater
PO Box 6
Milton-Freewater, OR 97862

RE: Water System Survey, City of Milton-Freewater, PWS ID: 4100522

Thank you for your time and assistance in performing the survey of your water system on January 7, 2009. Please thank Scott for his tour of your water system. His vast knowledge of the system was very helpful. The main purpose of the water system survey is to evaluate the entire water system in terms of supplying safe drinking water to the public. I have enclosed a copy of the report for your records. Please let me know if any corrections need to be made.

I am pleased that all deficiencies noted from the 2004 survey were corrected. **However, it was noted on the previous survey that the Master Plan was being updated by Anderson-Perry.** Currently, the Master Plan still has not been completed nor is there a copy of the current Master Plan in our records. This is a significant deficiency. I encourage you to get in touch with Anderson-Perry to get your Master Plan finalized.

You have done a real nice job maintaining your water system. I have enclosed information about outstanding performer criteria. I think this would be an attainable goal for your system.

If you have any questions or comments regarding this survey please give me a call at 541-966-0901.

Sincerely,

Amy Baker
Drinking Water Specialist

c. Drinking Water Program, Marsha Fox, Portland

Outstanding Performance Criteria

DHS-Drinking Water Program

The Drinking Water Program (DWP) has identified criteria for determining whether a system using surface water should be considered to have outstanding performance. This designation is given at the completion of a water system survey, formerly referred to a sanitary survey. A water system survey is an on-site review of a system's sources, treatment, storage facilities, distribution system, operation and maintenance procedures, monitoring, and management, for the purpose of evaluating the system's capability of providing safe water to the public. Systems that are designated outstanding performers will have their water system survey frequency reduced from every 3 years to every 5 years.

The criteria for outstanding performance are:

1) No Maximum Contaminant Level (MCL) or Treatment Technique violations in the last 5 years;
2) No more than one Monitoring and Reporting violation in the last 3 years. The one violation must be resolved (results submitted);
3) No significant deficiencies identified during the current water system survey; and
4) Has not had a waterborne disease outbreak attributable to the water system in the last 5 years.

To check your water system's violation history, go to www.oregon.gov/dhs/ph/dwp, and click on "Data On-Line." Type in your water system name or PWS ID number. The date of the last survey is listed on this page. Towards the bottom of that page, under "For further information…," click on "Violations".

- An MCL violation will have "MCL" in the Violation Type column.
- Treatment Technique violations are for inadequate surface water treatment or corrosion control.
- If the system has one Monitoring and Reporting violation during the last 3 years, there must be a subsequent monitoring result for that contaminant on record in order to meet criterion #2.

We strongly encourage all systems to meet the Outstanding Performance criteria. We will review your system's designation for Outstanding Performance after completion of each sanitary survey. The designation will remain in effect as long as the criteria continue to be met.

If you have any questions relating to compliance with any of these criteria, please contact your regional Drinking Water Program or County Health Department staff person, or contact the DWP Phone Duty person at 971-673-0405.

DHS Oregon Department of Human Services

Inventory & Narrative
DHS Drinking Water Program
Sanitary Survey

Name of System: Milton-Freewater, City of **PWS ID#:** 41 0 0 5 2 2

Date of Survey: 01/07/2009
County: Umatilla

Inventory

Type		Status	Size	Season	
☒ Community (C)		Population:	6500	☒ All year	☐ Seasonal
☐ Non Transient Non-Community (NTNC)		Connections:	2400	Begins: (mm/dd)	01/01
		Service Chars	MU	Ends: (mm/dd)	12/31
☐ Transient Non-community (NC)		Ownership:	4	**Coliform Sampling**	
☐ State Regulated (NP)		**License**		Period: ☒ Monthly	☐ Quarterly
		☒ Not Lic ☐ HD ☐ Ag		Samples Required: 7	

Operator Certification Required	Responsible Agency
WD 2 WT ___ FE ☐ Small GW ☐	☒ State ☐ County ☐ Dept of Agriculture

Mailing Address:
Contact Name: Dave Bradshaw Phone: (541) 938-8272
Title: Superintendent Cell: ( )
Street Address: PO Box 6 Emergency #: ( )
City/State/Zip: Milton-Freewater, OR 97862 Email: dave.bradshaw@milton-freewater-or.gov

Legal/Owner Address:
Contact Name: same as above Phone: ( )
Title: Cell: ( )
Street Address: Emergency #: ( )
City/State/Zip: Email:

Supply Address:
Contact Name: Dave Bradshaw Phone: (541) 938-8272
Title: Superintendent Cell: ( )
Street Address: 501 Lamb St. Emergency #: ( )
City/State/Zip: Milton-Freewater, OR 97862 Email: dave.bradshaw@milton-freewater-or.gov

Emergency Systems Available:
Name: **PWS ID#:** 41

Narrative: The City has seven wells available for use. The wells are used in rotation for 1-3 week periods based on energy audit recommendations. Wells 9 & 6 are primarily used with wells 2 & 5 as backups. The remaining wells are exercised once a month. Wells 3,5,&6 pump into the 2MG North Reservoir. Well 2 pumps into the 1 MG Middle Reservoir and the 2 MG South Reservoir can be filled by either wells 8 or 9. Sodium hypochlorite is injected at each wellhead for residual maintenance. The system is divided into 3 pressure zones as shown in the attached documents.

DHS
Oregon Department of Human Services

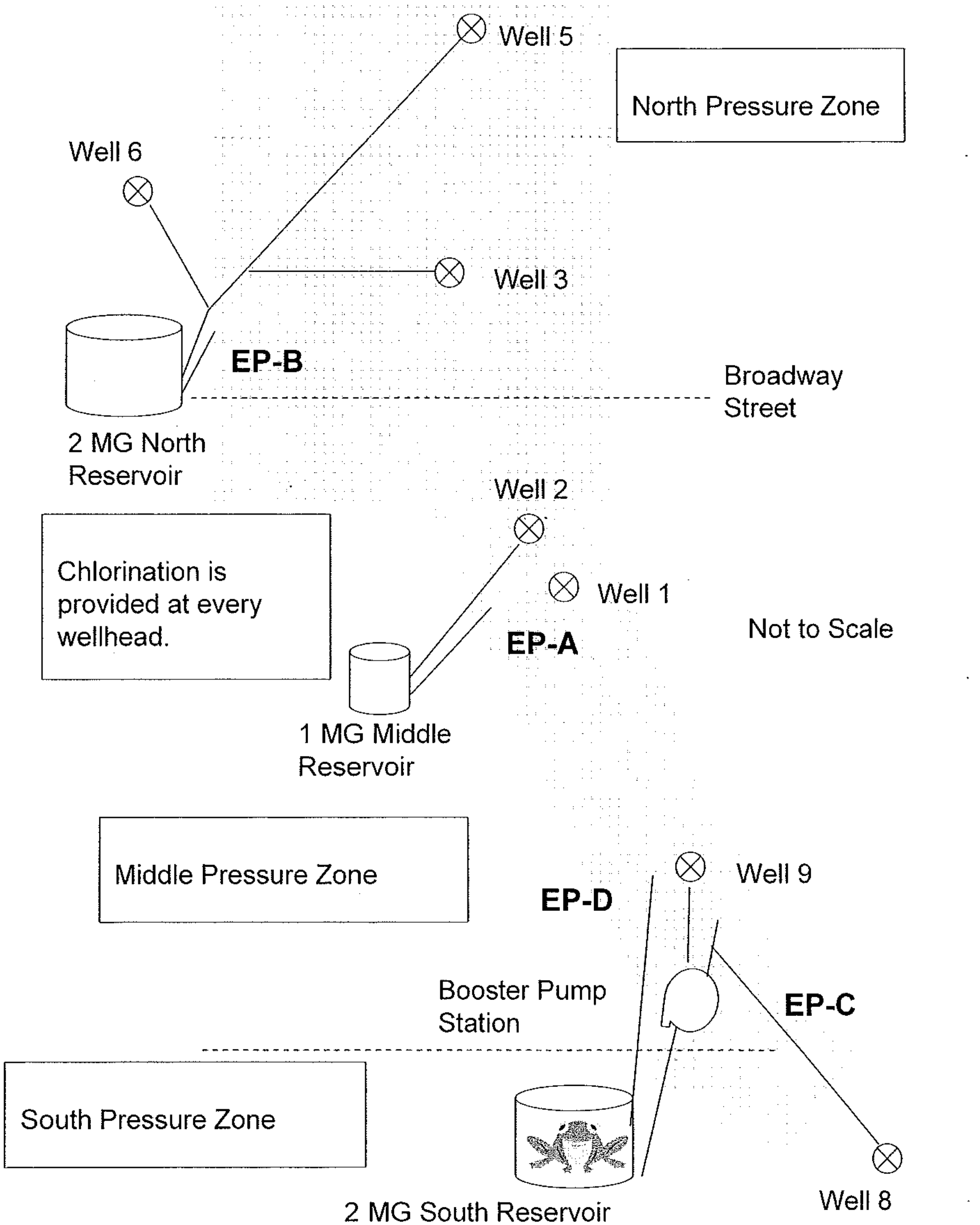
Sanitary Survey Deficiency Summary

DHS Drinking Water Program
Sanitary Survey

Name of System: Milton-Freewater, City of
PWS ID#: 41 0 0 5 2 2
Surveyor: Amy Baker
Date of Survey: 01/07/08
Date Corrective Action Plan is Due: na
County: Umatilla

Yes	No	Deficiencies	Date to be Corrected	Date Corrected
☐	☒	**Source Deficiencies**		
		Well Construction		
		Spring/Other Source		
☐	☒	**Treatment Deficiencies:**		
		Surface Water Treatment Deficiencies		
		Disinfection Deficiencies		
		Other Treatment Deficiencies		
☐	☒	**Finished Water Storage Deficiencies:**		
☐	☒	**Distribution Deficiencies:**		
☐	☒	**Monitoring Deficiencies**		
☒	☐	**Management & Operations Deficiencies:** No current Master Plan		
☐	☒	**Operator Certification Deficiencies:**		
☐	☒	**Other Rule Violations:**		

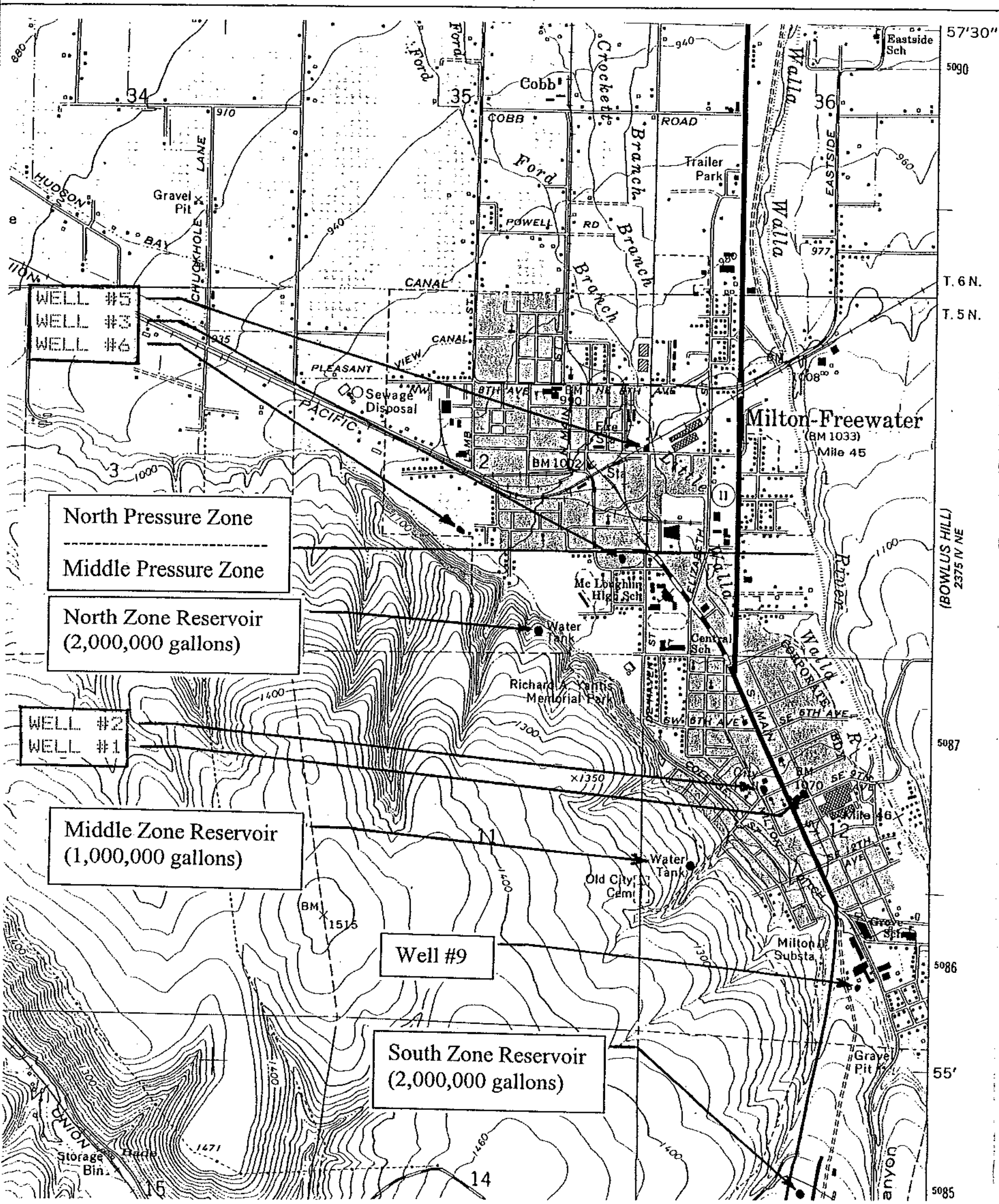
Comments: No current Master Plan on file - Master Plan is being updated by Anderson-Perry.


Well 5
North Pressure Zone
Well 6
Well 3
EP-B
Broadway Street
2 MG North Reservoir
Well 2
Chlorination is provided at every wellhead.
Well 1
Not to Scale
EP-A
1 MG Middle Reservoir
Middle Pressure Zone
Well 9
EP-D
Booster Pump Station
EP-C
South Pressure Zone
2 MG South Reservoir
Well 8

LOCATION MAP (USGS QUA HEET)

SUPPLY NAME: MI -FREEWATER
ID NUMBER : 4100 22

Quadrangle Map
USGS Map Name - Milton-Freewater, Oreg.
USGS Map Number - N4552.5-W11822.5/7.5



LOCATION MAP (USGS QU... HEET)

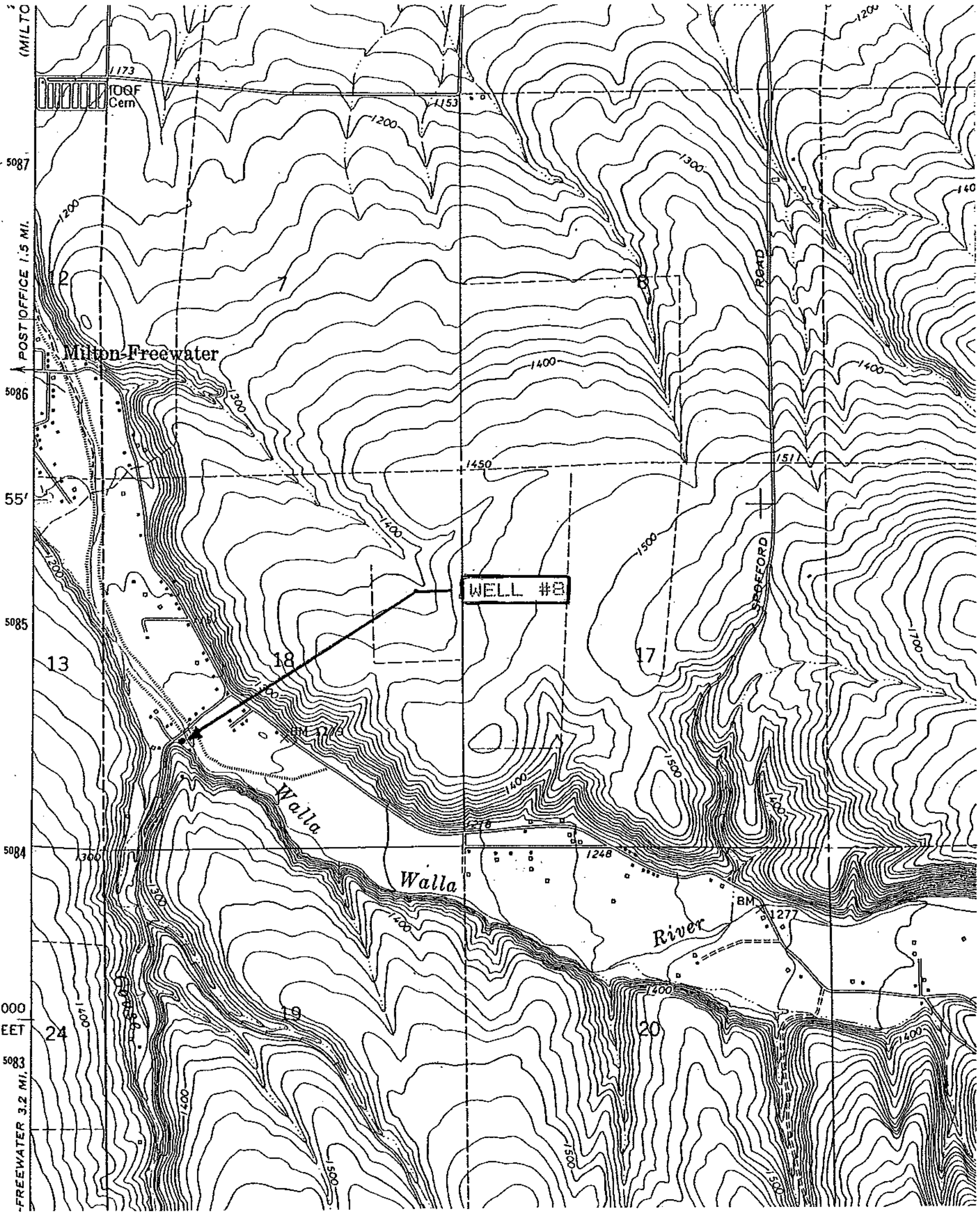
SUPPLY NAME: M1 . -FREEWATER

ID NUMBER : 4100522

Quadrangle Map

USGS Map Name - Bowlus Hill, Oreg.

USGS Map Number - N4552.5-W11815/7.5



DHS Oregon Department of Human Services

Source Information

DHS Drinking Water Program
Sanitary Survey

Name of System: Milton-Freewater, City of

PWS ID#: 41 0 0 5 2 2

ID	Entry Points (Location where water enters distribution and is sampled) Name	Ground	Surface	GWUDI	Pur. Ground	Pur.Surface	Permanent	Seasonal	Begins	Ends	Emergency	None	Treatment Codes
A	Wellfield (Wells 1 & 2)	☒	☐	☐	☐	☐	☒	☐			☐	☐	X421
B	Wellfield (Wells 3, 5, & 6)	☒	☐	☐	☐	☐	☒	☐			☐	☐	X421
C	EP for Well 8	☒	☐	☐	☐	☐	☒	☐			☐	☐	X421
D	EP for Well 9	☒	☐	☐	☐	☐	☒	☐			☐	☐	X421

ID		Individual Sources (Contributing to Entry Point:)) Name	*Land Use*	Capacity (GPM)	Ground	Surface	GWUDI	Pur.Ground	Pur.Surface	Permanent	Seasonal	Emergency	None	Treatment Codes
A	A	Well 1 (UMAT 3961/3960/5999)	G,E	1400	☒	☐	☐	☐	☐	☒	☐	☐	☐	X421
A	B	Well 2 (UMAT 3962)	G	900	☒	☐	☐	☐	☐	☒	☐	☐	☐	X421
B	A	Well 3 (UMAT 3930/3924/5786)	G,E	1300	☒	☐	☐	☐	☐	☒	☐	☐	☐	X421
B	B	Well 5 (UMAT 3909)	G	1100	☒	☐	☐	☐	☐	☒	☐	☐	☐	X421
B	C	Well 6 (UMAT 3929)	G	1400	☒	☐	☐	☐	☐	☒	☐	☐	☐	X421
C	A	Well 8 (UMAT 4005/4010)	H,M	1600	☒	☐	☐	☐	☐	☒	☐	☐	☐	X421
D	A	Well 9 (UMAT 3965, L11021)	G,E	1000	☒	☐	☐	☐	☐	☒	☐	☐	☐	X421

*Land Use Codes: (A) **Pristine Forest** (B) **Irrigated Crops** (C) **Non-Irrigated Crops** (D) **Pasture** (E) **Light Industry** (F) **Heavy Industry** (G) **Urban-Sewered Area** (H) **Rural On-Site Sewage Disposal** (I) **Urban On-Site Sewage Disposal** (J) **Rangeland** (K) **Managed Forest** (L) **Commercial** (M) **Recreational Use**

List current operational patterns for all sources (e.g., Well 1 used continuously @ 100 gpm; Wells 2 & 3 used 6 hours/day; Well 1 used 30% of time & Well 2 used 70%; alternate use of Creek A & Creek B every 2 weeks; etc.). Be as specific as possible, and attach water use records if available.

System primarily uses wells 9&6. Wells 2&5 are backups. Wells 1,3,&8 are not used regularly but are exercised monthly. Wells 1,3,5&6 have entrained air in water, so they are pumped to reservoir to relieve air.

Yes	No	
☒	☐	Does the water system have water rights for all sources? (☐ not required)
☒	☐	Has a Source Water Assessment been completed by DWP or DEQ? June 2005
☒	☐	Delineation (include date) or USGS Location Map (name and number) attached/on file? Milton-Freewater
		Date of delineation or last update to delineation: ______ (☐ N/A)
☐	☒	Have there been any modifications to the existing wells(s) or spring(s), e.g., deepened, change in screened interval, springbox reconstruction: Describe below:
☐	☒	Have there been any new high-use wells, e.g., irrigation, municipal, industrial, etc., added within 1 mile of the existing source(s)? Provide direction and distance from system's well or spring and estimate use.

Comments:

DHS Oregon Department of Human Services

Well Information

DHS Drinking Water Program
Sanitary Survey

Name of System: Milton-Freewater, City of **PWS ID#:** 41 0 0 5 2 2

		Well 1		Well 2		Well 3		Well 5		Well 6		Well 8	
	Source ID#:	A	A	A	B	B	A	B	B	B	C	C	A
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
	Well Log on File:	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐
Wellhead Construction	Depth of Well (ft.)	656		902		596		502		952		1051	
	Depth of Grout Seal (ft.)	84		99		105		unk		unk		78	
	Year of Installation (yr.)	1937		1944		1946		1936		1950		1965	
	Casing Diameter (in.)	12		16		16		12		12		16	
	• Sanitary Seal & Casing Watertight	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐
	Screened Vent	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐
	Wellhead Protected from Flooding	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐
	• Well Meets Setbacks from Hazards	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐
	Water Level Device	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐
	• Wellhead Terminates Above Grade	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐
	Concrete Slab Around Casing	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐
	Casing Height Above Slab (in.)	24		24		24		24		24		24	
	Pitless Adapter	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒
	Protective Housing	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐
Control Building	Flowmeter	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐
	Pressure Gauge	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐
	Pump to Waste Piping	☐	☒	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐
	• Raw Sample Tap	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐
	• Treated Sample Tap ☐ N/A	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐
	Heated/Lighted	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐
	Floor Drain	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐
	Pump Removal Provision	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐
	Check Valve	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐
	Air/Vacuum Relief	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐
Pump Equipment	Pump Type*	VT		VT		VT		VT		VT		VT	
	Pump Setting	unk		unk		unk		unk		unk		unk	
	Discharge Pressure (psi)	unk		unk		unk		95		unk		unk	
	Horsepower (hp)	200		250		200		150		250		400	
	Bearing Lubrication (FG oil/water)	W		O		O		W		W		W	
	Pumping Capacity (gpm)	1400		900		1300		1100		1400		1600	
	Static Water Level (swl) (ft.)	228		214		185		177		233		235	
	SWL Date	01/09		01/09		01/09		01/09		01/09		01/09	

*** Pump Types:** (VT) Vertical Turbine (SU) Submersible (CE) Centrifugal (SJ) Shallow Jet (DJ) Deep Jet (OT) Other

Comments: Well 2 has back-up power supply. If necessary, would have ability to provide water to whole town. Chevron GST ISO 100 oil used for lube, NSF approved

DHS
Oregon Department
of Human Services

Well Information

DHS Drinking Water Program
Sanitary Survey

Name of System: Milton-Freewater, City of **PWS ID#:** 41 0 0 5 2 2

Source ID#:	D	A										
Well Name:	Well 9											
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Well Log on File:	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Wellhead Construction												
Depth of Well (ft.)	918											
Depth of Grout Seal (ft.)	290											
Year of Installation (yr.)	1951											
Casing Diameter (in.)	18											
• Sanitary Seal & Casing Watertight	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Screened Vent	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Wellhead Protected from Flooding	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
• Well Meets Setbacks from Hazards	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Water Level Device	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
• Wellhead Terminates Above Grade	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Concrete Slab Around Casing	☐	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Casing Height Above Slab (in.)	---											
Pitless Adapter	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Protective Housing	☐	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Control Building												
Flowmeter	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Pressure Gauge	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Pump to Waste Piping	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
• Raw Sample Tap	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
• Treated Sample Tap ☐ N/A	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Heated/Lighted	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Floor Drain	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Pump Removal Provision	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Check Valve	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Air/Vacuum Relief	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Pump Equipment												
Pump Type*	SU											
Pump Setting	unk											
Discharge Pressure (psi)	unk											
Horsepower (hp)	200											
Bearing Lubrication (FG oil/water)	W											
Pumping Capacity (gpm)	1000											
Static Water Level (swl) (ft.)	306											
SWL Date	01/09											

*** Pump Types:** (VT) Vertical Turbine (SU) Submersible (CE) Centrifugal (SJ) Shallow Jet (DJ) Deep Jet (OT) Other

Comments: Well 9 has an L tag: L11021. This well also pumps to the south reservoir. Recirculating water is kept flowing through a one-inch line to keep the water from going stagnant.

DHS Oregon Department of Human Services

Disinfection

DHS Drinking Water Program
Sanitary Survey

Name of System: Milton-Freewater, City of **PWS ID#:** 41 0 0 5 2 2

No #.	Disinfection Method*	Location	Disinfection Source Water	Residual Maintenance	Proportional to Flow	Dosage Recorded
1-7	Sodium Hypochlorite	all well head locations	☐	☒	☒	☐
			☐	☐	☐	☐
			☐	☐	☐	☐

*Chlorine Gas, Sodium Hypochlorite, On-site Generated Sodium Hypochlorite, Calcium Hypochlorite, Chloramines, Ozone, UV, Mixed-Oxidants, Other

Yes / No

- ☒ ☐ Is a DPD type test kit used?
- ☒ ☐ Are residuals recorded as required?
  - **Distribution:** ☒ Daily # samples: 1 ☐ Other: ______
  - **Entry Point (sw only):** ☐ Daily # samples: ______ ☐ Continuous if > 3300 pop
- ☐ ☒ If chlorinating for residual maintenance only, are raw water coliform samples taken? How often?

Yes / No ☐ **Chlorine gas:**

- ☐ ☐ Separate room for gas storage and feeder?
- ☐ ☐ Fan with on/off switch outside?
- ☐ ☐ Vent located next to the floor?
- ☐ ☐ Door with a window?

Yes / No

- ☐ ☐ Gas cylinders properly secured?
- ☐ ☐ Door that opens out
- ☐ ☐ Self-contained breathing apparatus?
- ☐ ☐ Air scrubber system?

Yes / No ☐ **UV Light**

- ☐ ☐ Plan Review Approval?
- ☐ ☐ Does all water contact UV (no bypass)?

Yes / No

- ☐ ☐ Is lamp sleeve cleaned?
- ☐ ☐ Is lamp replaced annually?
- ☐ ☐ Intensity sensor with alarm or shut-off?

CT Evaluation

Disinfection requirement (check one): ☐ (sw) 1.0 log inactivation giardia ☐ (sw) 0.5 log inactivation giardia ☐ (gw) 30 minutes contact time ☐ (gw) 4.0 log inactivation viruses

Maximum demand flow: ______

Effective volume calculation: (at lowest water level) ______

Minimum contact time: (estimated) ______

Yes / No

- ☐ ☐ Does contact chamber have effluent flow meter or adequate alternative?
  - If no, how is peak flow determined for CT? ______
- ☐ ☐ Has tracer study been conducted or adequate alternative?
  - Tracer Study Date: ______ Demand flow: ______
  - Volume used: ______ Results: ______ minutes
  - Describe alternate method to determine contact time: ______
  - Range of chlorine residual at first user: ______

Yes / No

- ☐ ☐ (SW only) Are PH, Temperature, and chlorine residual measured daily at first user? ______
- ☐ ☐ (SW only) Are CT values being calculated correctly? ______
- ☐ ☐ Are CT values met at all times? ______

Comments:

Oregon Department of Human Services (DHS)

Storage & Pressure Tanks

DHS Drinking Water Program
Sanitary Survey

Name of System: Milton-Freewater, City of **PWS ID#:** 41 0 0 5 2 [illegible]

Number	Name	Tank Type*	Tank Material	Year Built	Volume (gal.)
1	North Zone/Golf Course	G	Steel	1960	2,000,000
2	Middle Zone/SW 8th	G	Steel	1956	1,000,000
3	South Zone/Hwy 11	G	Steel	1998	2,000,000

* (G) Ground (E) Elevated (P) Pressure

Total Volume: 5,000,000

Reservoir Number:		1		2		3					
Reservoir Features		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Hatch	● Locked	X		X		X					
	● Watertight	X		X		X					
	Shoebox type lid (curbing)	X		X		X					
Features	Drain to Daylight	X		X		X					
	Overflow	X		X		X					
	● Flap Valve (on drain and/or overflow)	X		X		X					
	● Screened Vent	X		X		X					
	Water Level Gauge	X		X		X					
	Bypass Piping	X		X		X					
	Fence/Gate		X	X		X					
	Cathodic Plates Watertight ☒ N/A										
	Alarm for High/Low Levels	X		X		X					
Maintenance	Exterior in Good Condition	X		X		X					
	Approved Interior Coating	X		X		X					
	Annual Inspection	X		X		X					
	Cleaning Schedule	X		X		X					
	Continuously Disinfected ● (redwood only)	X		X		X					
Plumbing Configuration	Separate Inlet/Outlet	X		X		X					
	Baffling		X		X		X				
	Used for Contact Time		X		X		X				

Hydropneumatic Tank	Number:				
		Yes	No	Yes	No
Hydropneumatic Tank	Used for Contact Time				
	Accessible for Maintenance				
	Separate Inlet/Outlet				
	Bypass Piping				
	Access Port				
	Drain				
	Pressure Relief Device with Gauge				
	Air Blow Off Valve				
	Air Bladder/Diaphram				
	Valve for Adding Air				
	Water Level Sight Glass				

Comments

South Reservoir kept at 1/2 full. Cleaning schedule is based on annual inspections.

DHS Oregon Department of Human Services

Distribution System Information

DHS Drinking Water Program
Sanitary Survey

Name of System: Milton-Freewater, City of **PWS ID#:** 41 0 0 5 2 2

Service Area and Facility Map

Yes	No	
☒	☐	Does the system have a Service Area and Facility Map with the following features:

- ☒ Booster Pumps
- ☐ Pressure Reducting Valves
- ☒ Pressure Zones
- ☒ Sampling Points
- ☒ Sources-wells & withdrawal points
- ☒ Storage Facilities (reservoirs)
- ☐ Treatment Facilities
- ☒ Water Lines (including size and material)

Distribution Data

Yes	No		Comments
☒	☐	● System pressure >20 psi?	pressure ranges from ~58 psi to 70 psi
☒	☐	System metered? (What %?)	100%
☒	☐	Water system leakage <10%?	8-9%
☒	☐	Waterline depth > 30"?	36"-72"
☐	☒	Piping looped?	few dead-end lines
☒	☐	Hydrants or adequate blowoffs on all dead ends?	
☒	☐	Routine flushing? (How often?)	once a year
☒	☐	Adequate valving?	
☒	☐	Routine valve turning?	once a year

Comments:

Cross Connection Program (Community Systems Only)

Yes	No		Comments
☒	☐	● Ordinance or enabling authority?	
☒	☐	List of installed devices?	
☒	☐	● Are devices tested annually?	
☒	☐	● Certified inspector (if serving more than 300 connections)?	Rob Carter

Comments:

Booster Pumps

Number	Name (location)	Deficiencies Noted or Comments	HP	GPM	Aux. Power Yes	Aux. Power No
1	Well #9 building	pumps water to south reservoir	50		☐	☒
2	Well #9 building	pumps water to south reservoir	100		☐	☒
					☐	☐
					☐	☐
					☐	☐
					☐	☐

Comments:

DHS Oregon Department of Human Services

Water Quality Monitoring

DHS Drinking Water Program
Sanitary Survey

Name of System: Milton-Freewater, City of **PWS ID#:** 41 0 0 5 2

Contaminant	N/A	Frequency	Next Tests Due
Coliform Bacteria	☐	7/month	on-going
Nitrate	☐	once/year	2009
Arsenic	☐	once/every 3 years	2011
Inorganic Chemicals (sw)	☐	once/every 9 years	2011
Inorganic Chemicals (gw)	☒	---	---
SOC's	☐	twice/every 3 years	2011 (consecutive qtrs)
VOC's (sw)	☐	once/every 3 years	2011
VOC's (gw)	☒	---	---
Radiologicals	☐	**see schedule below**	---
Asbestos	☐	once/every 9 years	Summer 2011
TTHM's and HAA5's	☐	four/every 3 years	Summer 2010
Lead and Copper, # Sites: 20	☐	every 3 years	Summer 2010
TOC	☒	---	---
Turbidity	☒	---	---
Source Water Coliform	☒	---	---
Other: (Specify)	☒	---	---

Yes	No	
☒	☐	• Is all required monitoring current?

Comments:

Yes	No	
☐	☒	Has the system experienced chemical (last 5 years) or bacteriological (last 2 years) detections? If yes, what contaminant and when?
☒	☐	• Have all MCL violations been addressed?
☒	☐	Does the system have any monitoring reductions granted? Explain: HAA5&TTHM - every 3 years, Lead & Copper - every 3 years, IOC's - every 9 years
☒	☐	• Does the system have a written coliform sampling plan?

Does the plan include:

Yes	No		Yes	No	
☒	☐	Brief narrative	☐	☒	Rotation schedule?
☒	☐	Distribution map?	☒	☐	Repeat locations?
☒	☐	Sample site locations?			

Where in the system are the monitoring sites for TTHM and HAA5: (☐ Not required)

☒ ☐ Are TTHM and HAA5 samples taken at location of maximum residence time?

Comments: **Radiological schedule**

RAD	EP-A	EP-B	EP-C	EP-D
Gross Alpha	2015	2015	2015	2015
Radium 226/228	2015	2012	2012	2012
Uranium	2012	2012	2015	2012

DHS Oregon Department of Human Services

Management & Operations

DHS Drinking Water Program
Sanitary Survey

Name of System: Milton-Freewater, City of **PWS ID#:** 41 0 0 5 2 2

Management Operations

☒ ☐ • Does system have an operation and maintenance manual?
☒ ☐ • Does system have an emergency response plan?

Operator Certification

Requirements for system: WT: ______ WD: 2

Name	Certification Number	WT Level	WD Level	FE	Small System
DRC:*David Bradshaw	1845	2	2	☐	☐
see attached				☐	☐
				☐	☐
				☐	☐
				☐	☐

*DRC= direct responsible charge. Attach additional sheets if necessary to list all certified personnel.

Yes	No	
☒	☐	Is DRC identified?
☒	☐	• Is DRC certified at appropriate level?
☒	☐	• Does system have written operating protocols for other operators?

If DRC is a Contract Operator:

Yes	No	
☐	☐	Does DWP have contract on file?

How does contract operator work with system: ____________________

Plan Review/Master Plan

Yes	No	
☒	☐	• Have all major modifications (since 8/21/81) been approved by DWP?
☐	☒	Does system have a current plan review exemption for water main extensions?
☐	☒	• Does the system have a current (<20 yr. old) master plan? (☐ Not required if < 300 connections) What year was the plan completed? ☐
☐	☒	Does the master plan include a water conservation plan?

Compliance Status

Yes	No	
☒	☐	• Is water system in compliance (all orders resolved and not a significant non-complier)? How many violations has the system had in the past two years. 2
☒	☐	• Does the system issue Public Notice for Violations as required?

Other

☐	☒	Has a capacity assessment been completed by DWP? If yes, list deficiencies noted:
☒	☐	• Are consumer confidence reports sent to users each year?

Comments: There is no current Master Plan on file. Anderson-Perry is currently updating Master Plan.

Oregon Department of Human Services

Drinking Water Program

Water System #: OR4100522
MILTON-FREEWATER, CITY OF

Certification Level Required

Distribution: 2
Treatment: None
Filtration: None

Licensed Operators and their certification levels

Cert Number	Name	Distribution Level	Is DRC* Distribution	Treatment Level	Is DRC* Treatment	Filtration Endorsement	License Expires
D-1790	Scott D. Amon	1					12/31/2009
D-1827	Steve P. Birdwell, Sr.	2					12/31/2009
T-1845 D-1845	David L. Bradshaw	2	DRC Dist	2			12/31/2009 12/31/2009
D-6509	Murdeth S. Brannan						12/31/2006
D-6511	Robin W. Burrowes						12/31/2006
D-6558	David G. Robertson	1					12/31/2009
D-6559	Emilio A. Sandoval	1					12/31/2009
D-6275	Ken A. Weis	2					12/31/2009
D-6560	Richard L. Worden	1					12/31/2009

*Direct Resposible Charge
**Contract Operator
***Only Operators with a current certification will appear.

Distribution Grade 2

EPA Rule	Requirements
333-061-0235 OPERATOR REQUIREMENTS LEVELS 1-4	HS/GED and 3 years experience, *OR* HS/GED and 1 year relevant post-high school education and 2 years experience

For further information on this public water system click on the area of interest below.

Oregon
Theodore R. Kulongoski, Governor

Department of Human Services
Health Services
Drinking Water Program
700 SE Emigrant, Rm. 240
Pendleton, OR 97801
(541) 276-8006
FAX (541) 276-4778

April 27, 2004

Howard Moss
City of Milton-Freewater
P.O. Box 6
Milton-Freewater, Oregon 97862

Re: Sanitary Survey of the City of Milton-Freewater, PWS ID: 4100522

Please thank Scott for his time and assistance in performing the sanitary survey. I have enclosed a copy of the survey report for your records. The report is based on information collected during the April 20th site visit. Please review the report and let me know if you find any errors.

The following deficiencies need to be addressed to meet public water system standards:

- An emergency response plan must be developed by December 31, 2004. I have enclosed a handout that summarizes the requirements. More detailed instructions are available on the Drinking Water Program website: http://www.ohd.hr.state.or.us/dwp/erc.cfm If you do not have internet access or would like a hard copy let me know.

- An Operations and Maintenance manual must be developed. There is information about this on the back of the emergency response plan handout.

- A flap valve needs to be installed on the 8th Street reservoir overflow pipe.

Monitoring:

- To be considered complete, the City's coliform sampling plan needs to include the following elements:
  - a map of the distribution system showing routine and repeat sample sites
  - a narrative description of the plan
  - a sample siting plan and maintenance program that identifies routine and repeat sampling sites and a rotation schedule. I have enclosed a Pipeline article that goes into more detail.

Sani y Survey Deficiency Summ y

OHD Drinking Water Program Sanitary Survey

System: MILTON-FREEWATER, CITY OF PWS ID: 41 00522

Operator/Contact: HOWARD MOSS County: UMATILLA

Yes	No	Deficiency	Date to be Corrected	Date Corrected
☐	☒	**Surface Source Deficiencies**		
☐	☒	**Well Construction Deficiencies**		
☐	☒	**Spring / Other Deficiencies**		
☐	☒	**Disinfection Deficiencies**		
☐	☒	**Treatment Deficiencies**		
☒	☐	**Storage / Pressure Tank Deficiencies**		
		NO FLAP VALVE ON 8TH ST. RESERVOIR OVERFLOW		
☐	☒	**Distribution Deficiencies**		
☒	☐	**Monitoring Deficiencies**		
		ASBESTOS		
☐	☒	**Management Deficiencies**		
		NO EMERGENCY RESPONSE PLAN / O&M MANUAL		

Comments:

Surveyor: BILL GOSS Date of Survey: 4/20/04

Inventory & Narrative

C. , Drinking Water Program Sanitary Surve,

System: MILTON-FREEWATER, CITY OF PWS ID: 41 0 0 5 2 2

Inventory

Date of Survey: 4/20/04
County: UMATILLA

Type
- ☒ Community (C)
- ☐ Non-Transient non-community (P)
- ☐ Transient non-community (N)
- ☐ State-regulated (S)

Size
- Population: 6500
- Connections: 2400
- Service Chars: R 1
- Ownership: 4

License
☒ Not Lic. ☐ HD ☐ Ag.

Season
☒ All year ☐ Seasonal
Begins: Ends:

Coliform Sampling
Period: ☒ Monthly ☐ Quarterly
Samples Required: 7

Responsible Agency
☒ State ☐ County ☐ Dept. of Ag.

Mailing Address:
Contact Name / Phone #: HOWARD MOSS 541-938-5531 x8271
Street Address: P.O. BOX 6
City, State, Zip: MILTON-FREEWATER OR 97862

Legal/Owner Address:
Contact Name / Phone #: HOWARD MOSS 541-938-5531 x8271
Street Address: 722 S MAIN
City, State, Zip: MILTON-FREEWATER OR 97862

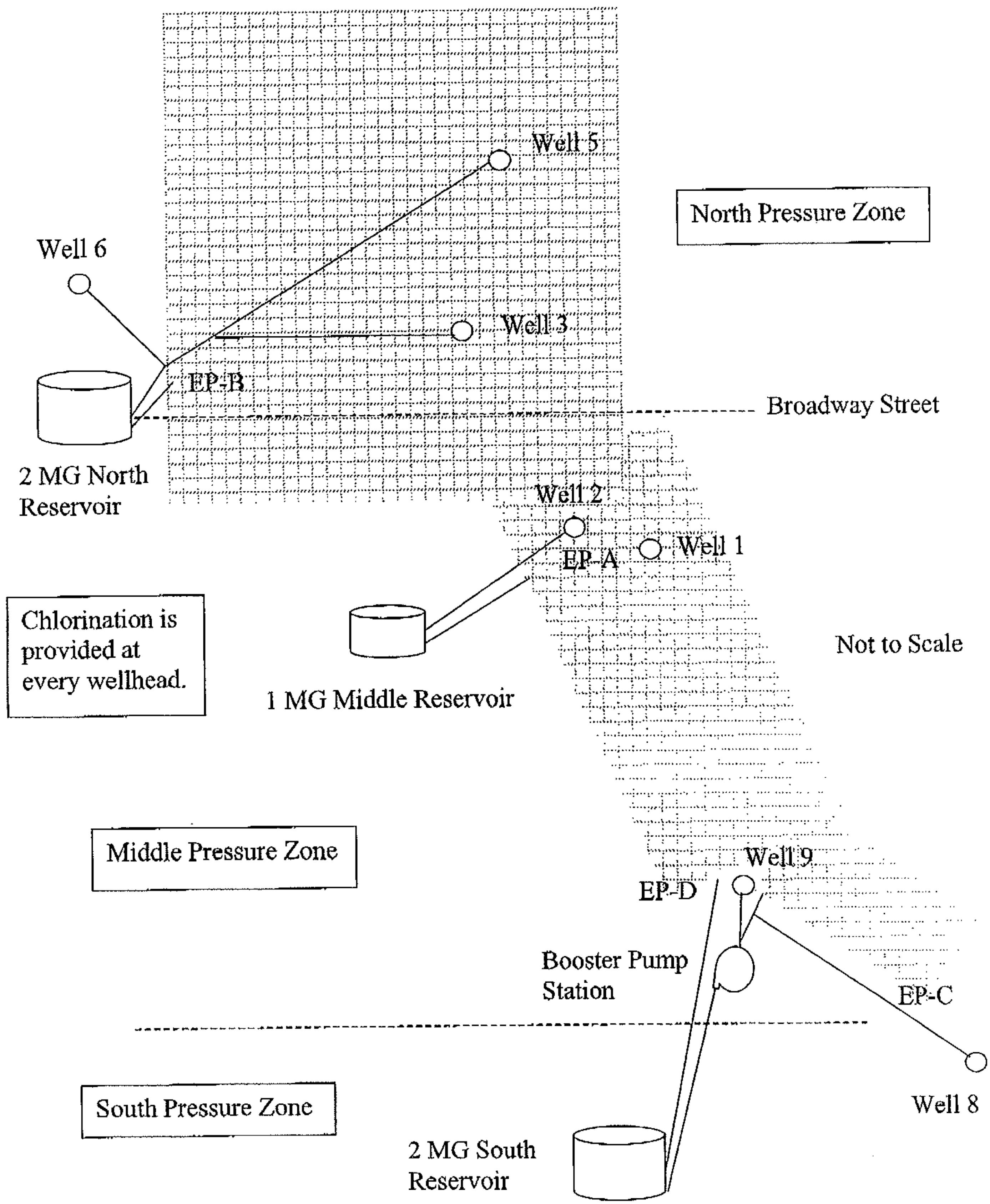
Supply Address:
Contact Name / Phone #: SAME AS ABOVE
Street Address:
City, State, Zip:

Emergency Systems available:
Name: N/A PWS ID#:
Name: PWS ID#:
Name: PWS ID#:

Narrative:

The City has seven deep basalt wells for sources. The wells are used in rotation for 1 to 3 week periods based on energy audit recommendations. Wells 1 and 8 are not used as regular sources but are exercised once a month. Wells 3, 5, and 6 pump directly into the 2 MG North Reservoir. Well 2 pumps directly into the 1 MG Middle Reservoir. The 2 MG South Reservoir can be filled by either well 8 or 9. Sodium hypochlorite is injected at each wellhead for residual maintenance. The system is divided into three pressure zones as shown on the attached schematic.

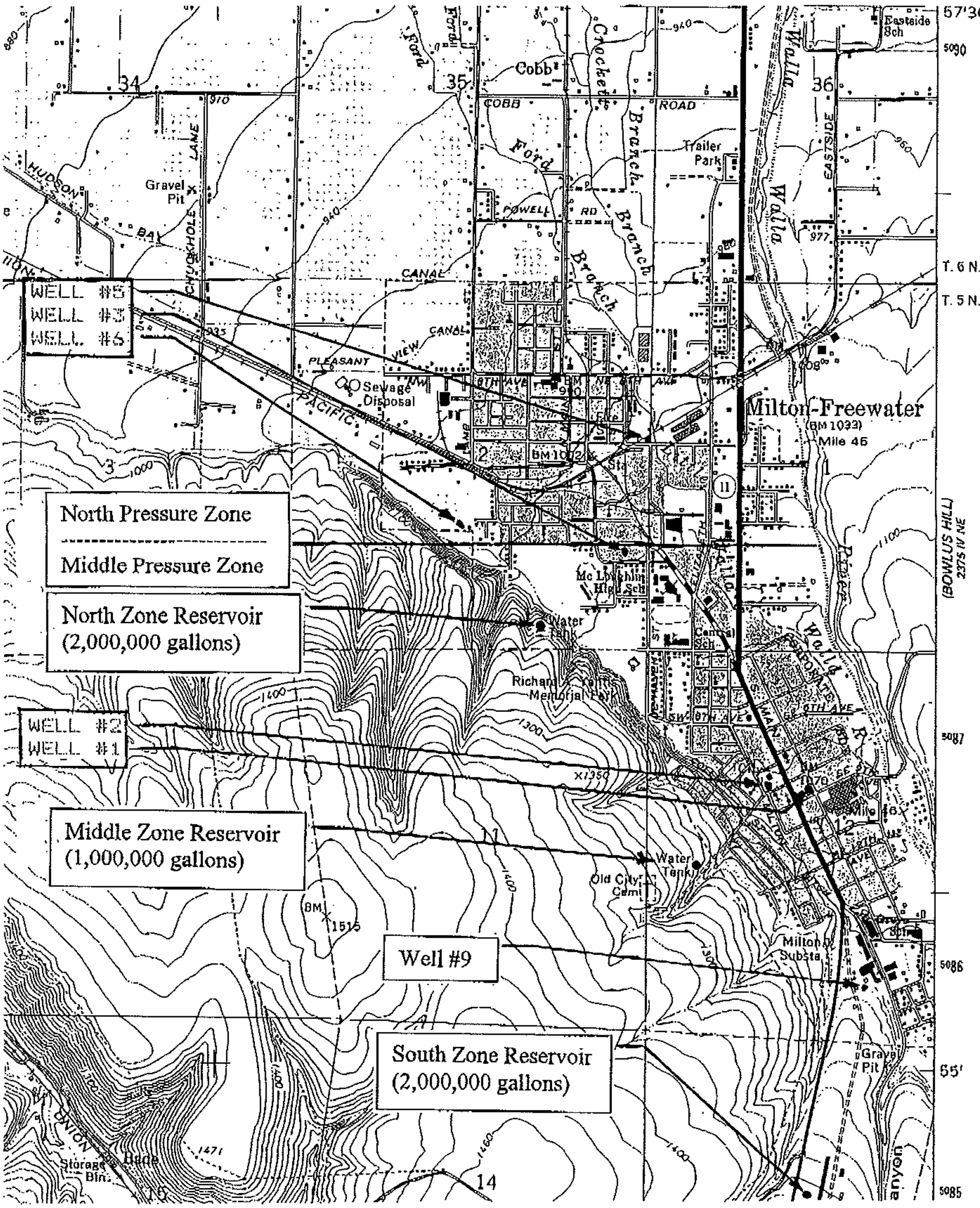
Milton-Freewater, City of Schematic PWS ID: 4100522



LOCATION MAP (USGS QUA... HEET)	SUPPLY NAME: MI... -FREEWATER ID NUMBER : 4100..22

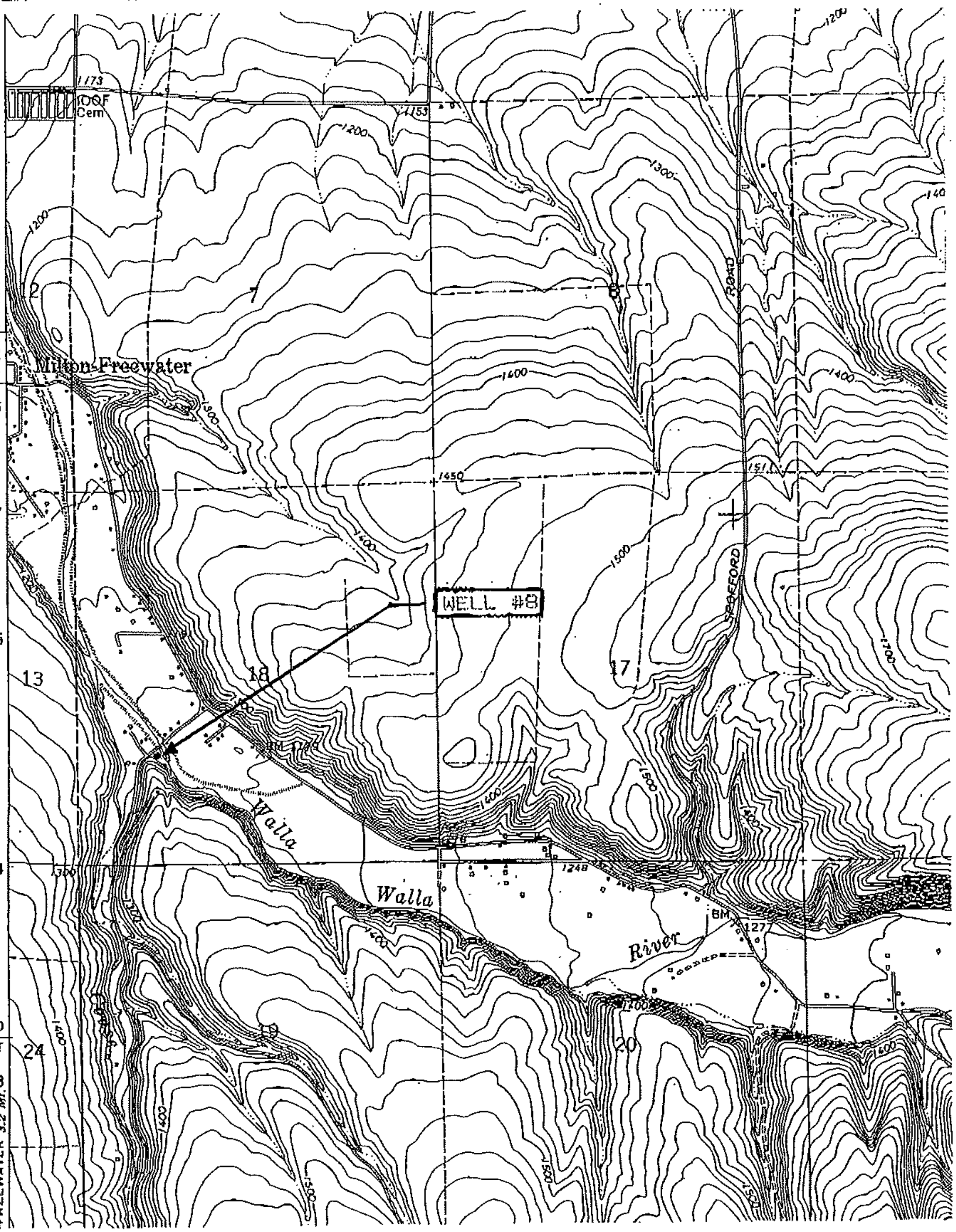
4 .. 14

Quadrangle Map
USGS Map Name - Milton-Freewater, Oreg.
USGS Map Number - N4552.5-W11822.5/7.5



LOCATION MAP (USGS QU... HEET) | SUPPLY NAME: M1 - -FREEWATER | 5 of 14
ID NUMBER : 4100522

Quadrangle Map
USGS Map Name - Bowlus Hill, Oreg.
USGS Map Number - N4552.5-W11815/7.5



Source Information

OHD Drinking Water Program Sanitary Survey

System: MILTON-FREEWATER, CITY OF **PWS ID: 41** 00522

Entry Points: (Location where water enters distribution and is sampled)

ID	Name	Source Type: Ground	Surface	GWUDI	Pur. Ground	Pur. Surface	Availability: Permanent	Seasonal	Begins	Ends	Treatment Codes: Emergency	None	
A	WELLFIELD (WELLS #1 & #2)	X					X		/	/			X421
B	WELLFIELD (WELLS #3, #5 & #6)	X					X		/	/			X421
C	EP FOR WELL #8	X					X		/	/			X421
D	EP FOR WELL #9	X					X		/	/			X421
									/	/			
									/	/			

Individual Sources contributing at Entry Point:

ID		Name	Land Use*	Capacity (GPM)	Source Type: Ground	Surface	GWUDI	Pur. Ground	Pur. Surface	Availability: Permanent	Seasonal	Emergency	Treatment Codes: None	
A	A	WELL #1	G,E	1400	X					X				X421
A	B	WELL #2	G	900	X					X				X421
B	A	WELL #3	G,E	1300	X					X				X421
B	B	WELL #5	G	1100	X					X				X421
B	C	WELL #6	G	1400	X					X				X421
C	A	WELL #8 - COUSE CREEK ROAD	H, M	1600	X					X				X421

*Land Use Codes: (A) Pristine Forest (B) Irrigated Crops (C) Non-Irrigated Crops (D) Pasture (E) Light Industry (F) Heavy Industry (G) Urban-Sewered Area (H) Rural On-Site Sewage Disposal (I) Urban On-Site Sewage Disposal (J) Rangeland (K) Managed Forest (L) Commercial (M) Recreational Use

Comments: (How and when sources are used, etc.) SYSTEM ROTATES SOURCES. WELLS #1 AND #8 ARE NOT USED REGULARLY, BUT ARE EXERCISED MONTHLY. WELLS #3 #5 #6 HAVE ENTRAINED AIR IN WATER SO ARE PUMPED TO RESERVOIR TO LET AIR COME OUT OF THE WATER.

Yes	No	
X		Does the water system have water rights for all sources? (☐ Not required)
X		USGS Location Map (name and number) attached? MILTON-FREEWATER, BOWLUS HILL
	X	Has a Source Water Assessment been completed by OHD or DEQ?

Yes	No	
	X	Delineation attached/on file?
	X	Hydrogeologic/sensitivity analysis on file?
N	A	• Highly sensitive characteristics? Explain:

N/A Have there been any changes since the original Source Water Assessment? Explain:

Comments on Source Water Assessment:

Source Information

OHD Drinking Water Program Sanitary Survey

System: MILTON - FREEWATER, CITY OF **PWS ID: 41** 00522

Entry Points: (Location where water enters distribution and is sampled)

ID	Name	Source Type: Ground	Surface	GWUDI	Pur. Ground	Pur. Surface	Availability: Permanent	Seasonal	Begins	Ends	Emergency	Treatment Codes: None	
A		☐	☐	☐	☐	☐	☐	☐	/	/	☐	☐	
		☐	☐	☐	☐	☐	☐	☐	/	/	☐	☐	
		☐	☐	☐	☐	☐	☐	☐	/	/	☐	☐	
		☐	☐	☐	☐	☐	☐	☐	/	/	☐	☐	
		☐	☐	☐	☐	☐	☐	☐	/	/	☐	☐	
		☐	☐	☐	☐	☐	☐	☐	/	/	☐	☐	

Individual Sources contributing at Entry Point:

ID		Name	Land Use*	Capacity (GPM)	Source Type: Ground	Surface	GWUDI	Pur. Ground	Pur. Surface	Availability: Permanent	Seasonal	Emergency	Treatment Codes: None	
D	A	WELL #9	G,E	1000	☒	☐	☐	☐	☐	☒	☐	☐	☐	X421
					☐	☐	☐	☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	☐	☐	☐	

***Land Use Codes:** **(A)** Pristine Forest **(B)** Irrigated Crops **(C)** Non-Irrigated Crops **(D)** Pasture **(E)** Light Industry **(F)** Heavy Industry **(G)** Urban-Sewered Area **(H)** Rural On-Site Sewage Disposal **(I)** Urban On-Site Sewage Disposal **(J)** Rangeland **(K)** Managed Forest **(L)** Commercial **(M)** Recreational Use

Comments: (How and when sources are used, etc.) ____________

Yes	No	
☐	☐	Does the water system have water rights for all sources? (☐ Not required) ____
☐	☐	USGS Location Map (name and number) attached? ____
☐	☐	Has a Source Water Assessment been completed by OHD or DEQ? ____

Yes	No	
☐	☐	Delineation attached/on file? ____
☐	☐	Hydrogeologic/sensitivity analysis on file? ____
☐	☐	• Highly sensitive characteristics? Explain: ____

☐ ☐ Have there been any changes since the original Source Water Assessment? Explain: ____

Comments on Source Water Assessment: ____

Source: Well Information

OHD Drinking Water Program Sanitary Survey

System: MILTON-FREEWATER, CITY OF **PWS ID: 41** 00522

Source ID:	AA		AB		BA		BB		BC		CA	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Well Log on File	X		X		X		X		X		X	

Wellhead Construction

	AA		AB		BA		BB		BC		CA	
Depth of Well (ft.)	656		902		596		502		952		1051	
Depth of Grout Seal (ft.)	84		99		105		UNK		UNK		78	
Year of Installation (yr.)	1937		1944		1946		1936		1950		1965	
Casing Diameter (in.)	12		16		16		12		12		16	
• Sanitary Seal & Casing Watertight	X		X		X		X		X		X	
• Screened Vent	X		X		X		X		X		X	
• Wellhead Protected from Flooding	X		X		X		X		X		X	
• Well Meets Setbacks from Hazards	X		X		X		X		X		X	
Water Level Device	X		X		X		X		X		X	
• Wellhead Terminates Above Grade	X		X		X		X		X		X	
• Concrete Slab Around Casing	X		X		X		X		X		X	
Casing Height Above Slab (in.)	24		24		24		24		24		24	
Pitless Adapter		X		X		X		X		X		X
• Protective Housing	X		X		X		X		X		X	

Control Building

	AA		AB		BA		BB		BC		CA	
Flowmeter	X		X		X		X		X		X	
Pressure Gauge	X		X		X		X		X		X	
• Pump to Waste Piping		X	X		X		X		X		X	
• Raw Sample Tap	X		X		X		X		X		X	
• Treated Sample Tap	X		X		X		X		X		X	
Heated/Lighted	X		X		X		X		X		X	
Floor Drain	X		X		X		X		X		X	
Pump Removal Provision	X		X		X		X		X		X	
Check Valve	X		X		X		X		X		X	
Air/Vacuum Relief	X		X		X		X		X		X	

Pumping Equipment

	AA	AB	BA	BB	BC	CA
Pump Type*	VT	VT	VT	VT	VT	VT
Pump Setting (ft.)						
Discharge Pressure (psi)				95		
Horsepower (hp)	200	250	200	150	250	400
Bearing Lubrication (FG oil/water)	W	O	O	W	W	W
Pumping Capacity (gpm)	1400	900	1300	1100	1400	1600
Static Water Level (ft..)	228	200	182	177	160	235

*Pump Types: (VT) Vertical Turbine (SU) Submersible (CE) Centrifugal (SJ) Shallow Jet (DJ) Deep Jet (OT) Other

Comments: AB-WELL #2 CASED TO 99 FT., SEALED TO 99 FT AS SEEN ON VIDEO.
BC-WELL #6 CASED TO 61 FT.
CHEVRON GST ISO 68 OIL USED FOR LUBE, NSF APPROVED.

Source: Well Information

OHD Drinking Water Program Sanitary Survey

System: MILTON-FREEWATER, CITY OF **PWS ID: 41** 00522

Source ID:	DA	
	Yes	No
Well Log on File	X	

		DA Yes	DA No
Wellhead Construction	Depth of Well (ft.)	918	
	Depth of Grout Seal (ft.)	290	
	Year of Installation (yr.)	1951	
	Casing Diameter (in.)	18	
	• Sanitary Seal & Casing Watertight	X	
	• Screened Vent	X	
	• Wellhead Protected from Flooding	X	
	• Well Meets Setbacks from Hazards	X	
	Water Level Device	X	
	• Wellhead Terminates Above Grade	X	
	• Concrete Slab Around Casing		X
	Casing Height Above ~~Slab~~ Grade (in.)	24	
	Pitless Adapter	X	
	• Protective Housing		X
Control Building	Flowmeter	X	
	Pressure Gauge	X	
	• Pump to Waste Piping	X	
	• Raw Sample Tap	X	
	• Treated Sample Tap	X	
	Heated/Lighted	X	
	Floor Drain	X	
	Pump Removal Provision	X	
	Check Valve	X	
	Air/Vacuum Relief	X	
Pumping Equipment	Pump Type*	SU	
	Pump Setting (ft.)		
	Discharge Pressure (psi)		
	Horsepower (hp)	200	
	Bearing Lubrication (FG oil/water)	W	
	Pumping Capacity (gpm)	1000	
	Static Water Level (ft..)	300	

*Pump Types: (VT) Vertical Turbine (SU) Submersible (CE) Centrifugal (SJ) Shallow Jet (DJ) Deep Jet (OT) Other

Comments: DA - WELL #9 PUMPS TO WASTE FOR 6-7 MINUTES UPON STARTING UP TO HELP WITH TASTE/ODOR. A ONE-INCH LINE AT WELL #9 RECIRCULATES ~30,000 GAL/DAY FROM SOUTH RESERVOIR FOR TURNOVER IN TANK.

Disinfection

OHD Drinking Water Program Sanitary Survey

System: MILTON-FREEWATER, CITY OF PWS ID: 41 00522

#	Disinfection Method*	Location	Disinfection Source Water	Residual Maintenance	Proportional to flow	Dosage Recorded
1-7	SODIUM HYPOCHLORITE	ALL WELLHEADS	☐	☒	☒	☐
			☐	☐	☐	☐
			☐	☐	☐	☐

*Chlorine Gas, Sodium Hypochlorite, On-Site Generated Sodium Hypochlorite, Calcium Hypochlorite, Chloramines, Ozone, UV, Mixed-Oxidants, Other

Yes	No	
☒	☐	• Is a DPD type test kit used?
☒	☐	• Is free chlorine residual maintained?
☒	☐	• Are residuals recorded at least daily? ☒Daily ☐Continuous ☐Other ______
☒	☐	Is protective equipment available?

Type of protective equipment: ______

N/A ☐ **Chlorine Gas:**

	# ___ Yes	# ___ No	# ___ Yes	# ___ No	# ___ Yes	# ___ No
• Separate room for gas storage and feeder?	☐	☐	☐	☐	☐	☐
• Fan with on/off switch outside?	☐	☐	☐	☐	☐	☐
• Vent located next to the floor?	☐	☐	☐	☐	☐	☐
• Door with a window?	☐	☐	☐	☐	☐	☐
• Gas cylinders properly secured?	☐	☐	☐	☐	☐	☐
• Door that opens out?	☐	☐	☐	☐	☐	☐
• Self-contained breathing apparatus?	☐	☐	☐	☐	☐	☐
An air scrubber system?	☐	☐	☐	☐	☐	☐

N/A ☐ **Disinfection with UV light**

Yes	No		Yes	No	
☐	☐	• Plan Review Approval (P.R. # ____)	☐	☐	• Is lamp replaced annually
☐	☐	• Does all water contact UV (no bypass)	☐	☐	• Alarm or shut off
☐	☐	• Is lamp sleeve cleaned			

Source Water Classification: ☐Ground ☐Filtered Surface ☐Unfiltered Surface ☐GWUDI (check all that apply)

CT Evaluation

Disinfection requirement: _____ log removal for ☐giardia ☐viruses **OR** _____ minutes

Maximum demand flow: __________ gpm, Minimum contact time: __________ minutes

Contact time determined by tracer study or estimated? ______________

Range of chlorine residuals at first user: ______________

Yes	No	
☐	☐	• Are CT values met at all times?
☐	☐	Has disinfection benchmark been established? (☐Not required)

Comments: RESIDUAL KEPT BETWEEN 0.1-0.3 mg/L

Storage & Pressure Tanks

OHD Drinking Water Program Sanitary Survey

System: MILTON-FREEWATER, CITY OF **PWS ID:** 41 00522

Number	Name	Tank Type*	Tank Material	Year Built	Volume (gal.)
1	NORTH ZONE / GOLF COURSE	G	STEEL	1960	2,000,000
2	MIDDLE ZONE / SW 8TH	G	STEEL	1956	1,000,000
3	SOUTH ZONE / HWY 11	G	STEEL	1998	2,000,000

Reservoir Features

*(G) Ground (E) Elevated (P) Pressure

Total Volume= 5,000,000

Reservoir Number	1 Yes	1 No	2 Yes	2 No	3 Yes	3 No	Yes	No	Yes	No
Hatch: • Locked	X		X		X					
• Watertight	X		X		X					
Shoebox type lid (curbing)	X		X		X					
Features:										
• Drain to Daylight	X		X		X					
Overflow	X		X		X					
• Flap Valve (on drain and/or overflow) — TEES INTO DRAIN PIPE	UNK			X	X	CHECK VALVE				
• Screened Vent	X		X		X					
Water Level Gauge	X		X		X					
Bypass Piping	X		X		X					
Fence/Gate		X	X		X					
• Cathodic Plates Watertight — ALL HAVE ELEC. CORROSION CONTROL	X		X		X					
Alarm for high/low levels	X		X		X					
Maintenance:										
Exterior in Good Condition	X		X		X					
• Approved Interior Coating	X		X		X					
• Annual Inspection	X		X		X					
• Cleaning Schedule	X		X		X					
• Continuously disinfected	N/A		N/A		N/A					
Plumbing Configuration:										
Separate Inlet/Outlet	X		X		X					
Baffling		X		X		X				
Used for Contact Time		X		X		X				

Hydropneumatic Tank Number	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Used for Contact Time										
• Above Ground Installation										
Separate Inlet/Outlet										
Bypass Piping										
Access Port										
• Drain										
Pressure Relief Device w/Gauge										
Air Blow Off Valve										
Air Bladder/Diaphram										
Valve for Adding Air										
Water Level Sight Glass										

D'stribution System Informatic
L .D Drinking Water Program Sanitary Survey

System: MILTON - FREEWATER, CITY OF PWS ID: 41 0 0 5 2 2

Service Area and Facility Map

Yes No
[X] [ ] • Does the system have a Service Area and Facility Map with the following features:

- [X] Booster Pumps
- [ ] Pressure Reducing Valves
- [X] Pressure Zones
- [ ] Sampling Points
- [X] Sources-wells & withdrawal points
- [X] Storage Facilities (reservoirs)
- [ ] Treatment Facilities
- [X] Water Lines (including size and material)

Distribution Data

Yes	No	Question	Comments
X		• System pressure >20 psi?	N ~70PSI
X		System metered? (what %?)	
X		Water system leakage <10%?	
X		Waterline depth >30"?	36" - 72"
X		Piping looped?	FEW DEAD-END LINES
X		• Hydrants or adequate blowoffs on all dead ends?	
X		• Routine flushing? (how often?)	ONCE/TWICE/YR
X		Adequate valving?	
X		Routine valve turning? (how often?)	YEARLY

Comments:

Cross Connection Program (Community systems only)

Yes	No	Question	Comments
X		• Ordinance or enabling authority?	
X		• Testing records current?	
X		Approved devices installed?	
X		• Annual summary report sent?	
		If more than 300 Connections:	
X		• Certified inspector?	ROB CARTER
	X	• Complete written program plan?	

Comments:

Booster Pumps

Number	Name (location)	Deficiencies Noted or Comments	HP	GPM	Aux. Power
1	WELL #9 BUILDING	PUMPS WATER UP TO SOUTH RES.	50		Y[ ] N[X]
2	" " "	" " " "	100		Y[ ] N[X]
					Y[ ] N[ ]
					Y[ ] N[ ]
					Y[ ] N[ ]
					Y[ ] N[ ]

Comments:

/ater Quality Monitoring

OHD Drinking Water Program Sanitary Survey

System: MILTON-FREEWATER, CITY OF PWS ID: 41 0 0 5 2 2

Contaminant	N/A	Frequency	Next Tests Due
Coliform Bacteria			
Nitrate			
Inorganic Chemicals (SW)	☐	SEE FOLLOWING PAGE	
Inorganic Chemicals (GW)	☐		
Arsenic	☐		
SOC's-Regulated	☐		
SOC's-Unregulated (>10,000 pop.)	☐		
VOC's-Regulated	☐		
VOC's-Unregulated (>10,000 pop.)	☐		
Radiological	☐		
Asbestos	☐		
TTHM	☐		
HAA5	☐		
Lead & Copper	☐		
Turbidity	☐		
Source Water Microbiological	☐		

For CT calculations (see CPE).

Yes No

☐ ☒ • Is all required monitoring current?

Comments: ASBESTOS SAMPLE PAST DUE

☐ ☒ Has the system experienced chemical (last 5 years) or bacteriological (last 2 years) detections? If yes, what contaminant and when?

N/A • Have all MCL violations been addressed? NO MCL VIOLATIONS

☒ ☐ Does the system have any monitoring reductions granted? Explain: LEAD & COPPER, IOC'S

☒ ☐ • Does the system have a written coliform sampling plan?

Does the plan include:

Yes No

- ☐ ☒ Brief narrative?
- ☐ ☒ Distribution map?
- ☒ ☐ Sample site locations?
- ☒ ☐ Rotation schedule?
- ☐ ☒ Repeat locations?

Where in the system are the monitoring sites for TTHM and HAA5: (☐Not required)

- ☒ ☐ At the location of maximum residence time?
- ☒ ☐ At area(s) of low concentration of users?
- ☒ ☐ At areas representing different supply sources?

Comments: TTHM & HAA5 SAMPLES DUE FOR FIRST TIME IN SUMMER 2004. SAMPLE LOCATIONS TO BE DETERMINED.

City of Milton-Freewater Monitoring Schedule
Based on a population of 6,500
PWS ID #4100522

EP-A Wellfield - Wells #1 & #2

Contaminant	Frequency	Next Tests Due
Nitrate	annually	Oct. 2004
Inorganic Chemicals	once every nine years	July 2011
Arsenic	once every 3 years	July 2005
SOC's	2 consecutive qtrs. every three years	July 2005
VOC's	once every 3 years	July 2005
Radiologicals:*		
Gross Alpha	4 consecutive quarters	starting Jan. 2005
Combined Radium 226/228	4 consecutive quarters	starting Jan. 2005
Uranium	4 consecutive quarters	starting Jan. 2005

EP-B Wellfield - Wells #3, #5, #6

Nitrate	annually	Oct. 2004
Inorganic Chemicals	once every nine years	July 2011
Arsenic	once every 3 years	July 2005
SOC's	2 consecutive qtrs. every three years	July 2005
VOC's	once every 3 years	July 2005
Radiologicals:*		
Gross Alpha	4 consecutive quarters	starting Jan. 2005
Combined Radium 226/228	4 consecutive quarters	starting Jan. 2005
Uranium	4 consecutive quarters	starting Jan. 2005

EP-C Well #8

Nitrate	annually	Oct. 2004
Inorganic Chemicals	once every nine years	Dec. 2011
Arsenic	once every 3 years	Dec. 2005
SOC's	2 consecutive qtrs. every three years	Dec. 2005
VOC's	once every 3 years	Dec. 2005
Radiologicals:*		
Gross Alpha	4 consecutive quarters	starting Jan. 2005
Combined Radium 226/228	4 consecutive quarters	starting Jan. 2005
Uranium	4 consecutive quarters	starting Jan. 2005

EP-D Well #9

Nitrate	annually	Oct. 2004
Inorganic Chemicals	once every ~~3~~ 9 years	Dec. ~~2005~~ 2011
Arsenic	once every 3 years	Dec. 2005
SOC's	2 consecutive qtrs. every three years	Dec. 2005
VOC's	once every 3 years	Dec. 2005
Radiologicals:*		
Gross Alpha	4 consecutive quarters	starting Jan. 2005
Combined Radium 226/228	4 consecutive quarters	starting Jan. 2005
Uranium	4 consecutive quarters	starting Jan. 2005

Distribution System

Coliform Bacteria	7 per month	Nov. 2003
Asbestos	once every nine years	May 2002 - past due
TTHM	4 samples annually	Summer 2004
HAA5	4 samples annually	Summer 2004
Lead & Copper	once every three years	Summer 2004

*every 9 years if no detections based on results collected between June 2000 and Dec. 8, 2003
every 6 years if < 1/2 MCL
every 3 years if > 1/2 MCL
quarterly if > MCL

Management & Operations

Oregon Drinking Water Program Sanitary Survey

System: MILTON - FREEWATER, CITY OF **PWS ID: 41** 00522

Management Operations

Identify management structure of water system staff: CITY COUNCIL / CITY MGR / PW DIRECTOR / WTR SUPERVISOR / CREW.

Yes	No	
X		Do water system revenues pay for operation, maintenance and staffing?
X		Do water system revenues go into a reserve fund for capital improvement projects?
	X	• Does system have an operation and maintenance manual?
	X	• Does system have an emergency response plan?

Operator/Cross Connection Certification

Requirements for system: WT___ WD 2

• Name	Certification Number	Water Treatment Level	Water Distribution Level	Filtration Endorsement	Cross Connection Inspection Number	Backflow Assembly Tester #
DRC:* DAVID BRADSHAW	1845	2	2	☐		
STEVE BIRDWELL	1827		2	☐		
SCOTT AMON	1790		1	☐		
KEN WEIS	6275		2	☐		
MURDOCH BRANNAN	6509		1	☐		

DRC = direct responsible charge. Attach additional sheets if necessary to list all certified personnel.

Yes	No	
X		• Is there an operator at required certification level?
X		• Are CEUs being maintained?

Plan Review/Master Plan

Yes	No	
X		• Have all major modifications (since 8/21/81) been approved by OHD?
	X	Does system have a current plan review exemption for water main extensions?
	X	• Does the system have a current (<20 yr. old) master plan? (☐ Not required if <300 connections)

[ ] What year was the plan completed?

Yes	No	
		Does the master plan include a water conservation plan?

Compliance Status

X		• Is water system in compliance (all Administrative Orders and Notices of Violation resolved)?
1		How many violations has the system had in the past two years?
X		Does the system issue Public Notice for Violations as required?

Other

	X	Has a capacity assessment been completed by OHD?

If yes, list deficiencies noted: ______

X		Are consumer confidence reports sent to users each year?

Comments: MASTER PLAN IS BEING PREPARED BY ANDERSON - PERRY.

UMAT 3965

RECEIVED
AUG 24 1951
STATE ENGINEER
SALEM. OREGON

Application No. U-403
Permit No. U-373
Well No. 1. Umatilla Canning Co.
UMATILLA CO

REPORT ON COMPLETION OF WELL

(Note: This report should be submitted to the State Engineer, Salem, Oregon, as soon as possible after the well is completed. If more than one well is covered by this permit, a separate report shall be filed for each)

Date of Report August 22, 1951

1. Location of well: SW ¼ of SE ¼ of Section 12 Twp. 5N Rge. 35 E., W. M.
2. Name of nearest natural surface stream Walla Walla River
3. Distance from well to that stream: Approx. 4000 feet.
4. If the well is less than 1300 feet from a natural surface stream, give the difference in elevation between the ground surface at the well and the lowest point in stream channel: -- feet.
5. Date of beginning drilling or digging January 11, 1951
6. Date well was completed June 22, 1951

7. LOG OF MATERIALS ENCOUNTERED

Character of Material	Depth at which encountered		Thickness of stratum	
Yellow cement gravel	At surface 0	ft.	41	ft.
Broken Basalt & Blue Clay	41	ft.	285	ft.
Medium gray basalt & alternate clay & mud	285	ft.	421	ft.
Broken gray basalt	421	ft.	562	ft.
Black basalt & gray basalt	562	ft.	751	ft.
Medium black basalt - (2ft. Hard black basalt 816-818 ft)	751	ft.	878	ft.
Gray hard basalt	878	ft.	881	ft.
Medium black basalt	881	ft.	894	ft.
Hard black basalt	894	ft.	913	ft.
Remarks: Medium black basalt	913	ft.	918	ft.

WELL INFORMATION

8. Diameter of well see below inches. Depth of well 918 feet.
9. Depth at which water was first encountered 90 feet.
10. Water level when completed: 205 feet below ground surface.
11. Additional information regarding well; such as soil conditions, quick sand, caves, obstructions, rock, etc.: Some caving - 321 ft to 500 ft.

8. 24" from 0 to 104 ft.
20" from 104 to 321 ft.
16" from 321 to 690 ft.
12" from 690 to 918 ft.

CASING REPORTED
18"ϕ 0 TO 193'
16"ϕ 193' TO 296'
(15.25" I.D.)

139-140 ENCRUSTED, SEEPAGE
146-147
183-185 "Big" [illegible]
POSSIBLE [illegible] REDUCTION 185'±
-191' ALLOY
LESS
204 - CASING SEPARATION
STATIC LEVEL 284

5N/35-12(A)
UMATILLA Co

RECEIVED
AUG 24 1951
STATE ENGINEER
SALEM. OREGON

PUMP INFORMATION

12. Manufacturer of pump: A. D. Cook, Inc.
13. Address: Lawrenceburg, Indiana
14. Data on name or base plate: Serial No. 13254
Cook Rotation Pump
15. Data on pump bowl assembly: TR 5107 12 TR 527
26 12 TR 5280
16. Size of pump: 8" Turbine
17. Rated capacity: 950 gallons per minute.
18. Rated speed: 1765 revolutions per minute.
19. Number of stages: 8
20. Size of intake pipe: 8"
21. Size of discharge pipe: 8"
22. Length of intake pipe: 290 feet column, 25 feet bowl assembly, suction and strainer
23. Length of discharge pipe: 161.65 ft.
24. Suction lift: (difference in elevation between water surface in well and pump) 205 feet
25. Discharge lift: (difference in elevation between pump and end of discharge line) Hardly any -- pipe runs slightly downhill
26. Depth of pump intake below ground surface: 310 feet.
27. Remarks: This pump will be exchanged or worked over to that we can pump between 1400 and 1500 g.p.m. next season.

MOTOR OR ENGINE INFORMATION

28. Name of manufacturer: General Electric
29. Address: ~~XXXXX~~ Schenectady, N. Y.
30. Type of motor or engine: Electric Induction Motor
31. Data on name or base plate: Model 5K445A1A Service Factor 1.15 at Rated Volts
60 cycles 220/440 volts Type K Code F Frame 445 3 phase 60 cy
FL AMP 181/90.5 FL Speed 1765 No. WGJ6873648 TRYCLAD INDUCTION MOTOR
32. Rated horsepower: 75 H.P.
33. Rated speed of motor or engine: 1765 revolutions per minute.
34. Rated Capacity of Pump (with described motor)

950 g.p.m. at 205 ft. head
800 g.p.m. at 300 ft. head
700 g.p.m. at 350 ft. head
g.p.m. at ft. head
g.p.m. at ft. head

35. Remarks: We intend to trade this pump and motor or have it worked over next year (before June 1952) so that we can pump 1400-1500 g.p.m.

RECEIVED
AUG 24 1951
STATE ENGINEER
SALEM, OREGON

5N/35-12ab(1)

CAPACITY TEST

36. Date of test: 8/16 & 8/17, 1951 37. Temperature of water 60 °F. or ____ °C.
38. Motor speed during test: From 1250 - 1800 R.P.M.
39. Test made by (weir, tank or other means): Weir

40. RECORDING GUAGE	~~PUMPING PRESSURE~~ TOTAL HEAD		*Total lift in feet		Gallons per min.	°Feet to water level	¤Draw-down	+Time	
205	____ lbs.,	Gauge at pump	Total 205 ft.	____ in.	Static water level	ft.	____ ft.	____ M.	8/16
215	____ lbs.,	Gauge at pump	Total 215 ft.	____ in.	336	215 ft.	10 ft.	7:15 AM.	
244	____ lbs.,	Gauge at pump	Total 244 ft.	____ in.	795	244 ft.	39 ft.	8:30 AM.	
266	____ lbs.,	Gauge at pump	Total 266 ft.	____ in.	1220	266 ft.	61 ft.	10:30 AM.	
287	____ lbs.,	Gauge at pump	Total 287 ft.	____ in.	1407	287 ft.	82 ft.	12:30 PM.	
287	____ lbs.,	Gauge at pump	Total 287 ft.	____ in.	1407	287 ft.	82 ft.	5:30 PM.	
270	____ lbs.,	Gauge at pump	Total 270 ft.	____ in.	1220	270 ft.	65 ft.	7:30 PM.	
285	____ lbs.,	Gauge at pump	Total 285 ft.	____ in.	1407	285 ft.	80 ft.	9:00 PM.	
285	____ lbs.,	Gauge at pump	Total 285 ft.	____ in.	1407	285 ft.	80 ft.	12:00 M.	Midnight
285	____ lbs.,	Gauge at pump	Total 285 ft.	____ in.	1407	285 ft.	80 ft.	4:00 AM.	8/17
270	____ lbs.,	Gauge at pump	Total 270 ft.	____ in.	1312	270 ft.	65 ft.	4:10 AM.	
263	____ lbs.,	Gauge at pump	Total 263 ft.	____ in.	1220	263 ft.	58 ft.	4:20 AM.	
264	____ lbs.,	Gauge at pump	Total 264 ft.	____ in.	1220	264 ft.	59 ft.	6:00 AM.	
295	____ lbs.,	Gauge at pump	Total 295 ft.	____ in.	1501	295 ft.	90 ft.	6:10 AM.	
295	____ lbs.,	Gauge at pump	Total 295 ft.	____ in.	1501	295 ft.	90 ft.	6:18 AM.	
209	____ lbs.,	Gauge at pump	Total ____ ft.	____ in.	(Recovery)	ft.	____ ft.	6:23 AM.	
	____ lbs.,	Gauge at pump	Total ____ ft.	____ in.		ft.	____ ft.	____ M.	

* Difference in elevation between water level in well and outlet of pump test line.
° Distance from ground level to water surface in well.
¤ Distance water level is lowered during time interval.
\+ Hour and minute at which observation was made.

41. Installation will work efficiently under normal head of 325 ft.
42. Water is discharged into: Main lines, Umatilla Canning Company Plant.
43. Was water lowered to pump intake by test? Yes - deliberately.
44. Remarks: Didn't have enough column on to go beyond 1501 G.P.M. on test. Had only 90 feet of column beyond static water level of 205 feet.
Well recovered to static water level from 6:18 a.m. to 6:23 a.m. 8/17/51.
Recovery rate of 5 minutes.

GENERAL INFORMATION

45. Name of contractor or other party who drilled or dug well: A. A. Durand & Son
Address: 115 Rees Avenue, Walla Walla, Washington
46. Pump and motor were installed by: Pump, Pipe, & Power Co., Portland, Oregon
Address:
47. Capacity test was made by: A. A. Durand & Son, Walla Walla, Washington
Address:
48. General remarks:

UM 1
51825

AUG 07 1998

WATER RESOURCES DEPT.
SALEM, OREGON

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765)

(START CARD) # 092107

Instructions for completing this report are on the last page of this form.

(1) OWNER: Well Number #9
Name City Milton-Freewater
Address P.O. Box 6 722 S. Main
City Milton-Freewater State Ore. Zip 97862

(2) TYPE OF WORK
☐ New Well ☐ Deepening ☒ Alteration (repair/recondition) ☐ Abandonment

(3) DRILL METHOD:
☐ Rotary Air ☐ Rotary Mud ☐ Cable ☐ Auger
☐ Other Reverse Rotary

(4) PROPOSED USE:
☐ Domestic ☒ Community ☒ Industrial ☐ Irrigation
☐ Thermal ☐ Injection ☐ Livestock ☐ Other

(5) BORE HOLE CONSTRUCTION:
Special Construction approval ☐ Yes ☒ No Depth of Completed Well 820 ft.
Explosives used ☐ Yes ☒ No Type ______ Amount ______

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds
18"	+2	290	grout	+2	290	7yds

Packer Set at 290' To 18" x 12"

How was seal placed: Method ☐ A ☐ B ☒ C ☐ D ☐ E
☐ Other
Backfill placed from ______ ft. to ______ ft. Material ______
Gravel placed from ______ ft. to ______ ft. Size of gravel ______

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Liner ~~Casing~~:	12"	+2	462	.375	☒	☐	☒	☐
	10"	462'	692	.365	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Final location of shoe(s) ______

(7) PERFORATIONS/SCREENS:
☒ Perforations Method Factory cut
☐ Screens Type ______ Material ______

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
462'	692'	4x.25	40/ft	10"		☐	☒
40 slots per foot						☐	☐
						☐	☐
						☐	☐
						☐	☐

(8) WELL TESTS: Minimum testing time is 1 hour
☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
None	Done		1 hr.

Temperature of water ______ Depth Artesian Flow Found ______
Was a water analysis done? ☐ Yes By whom ______
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other ______
Depth of strata: ______

(9) LOCATION OF WELL by legal description:
County Umatilla Latitude ______ Longitude ______
Township 5 N or S Range 35 E or W WM.
Section 12 SW 1/4 SE 1/4
Tax Lot 1104 Lot ______ Block ______ Subdivision ______
Street Address of Well (or nearest address) Hwy 11

(10) STATIC WATER LEVEL:
292 ft. below land surface. Date 7-16-98
Artesian pressure ______ lb. per square inch. Date ______

(11) WATER BEARING ZONES:
Depth at which water was first found ______

From	To	Estimated Flow Rate	SWL
No Drilling			

(12) WELL LOG:
Ground Elevation ______

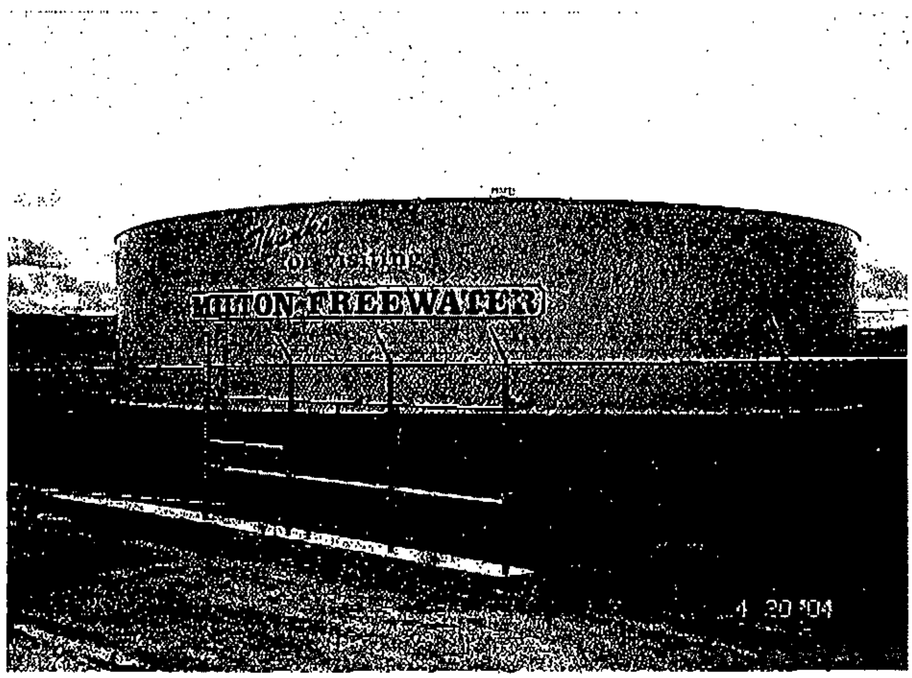
Material	From	To	SWL
Did No Drilling just installed liner in existing well.			

Date started 7-10-98 Completed 7-28-98

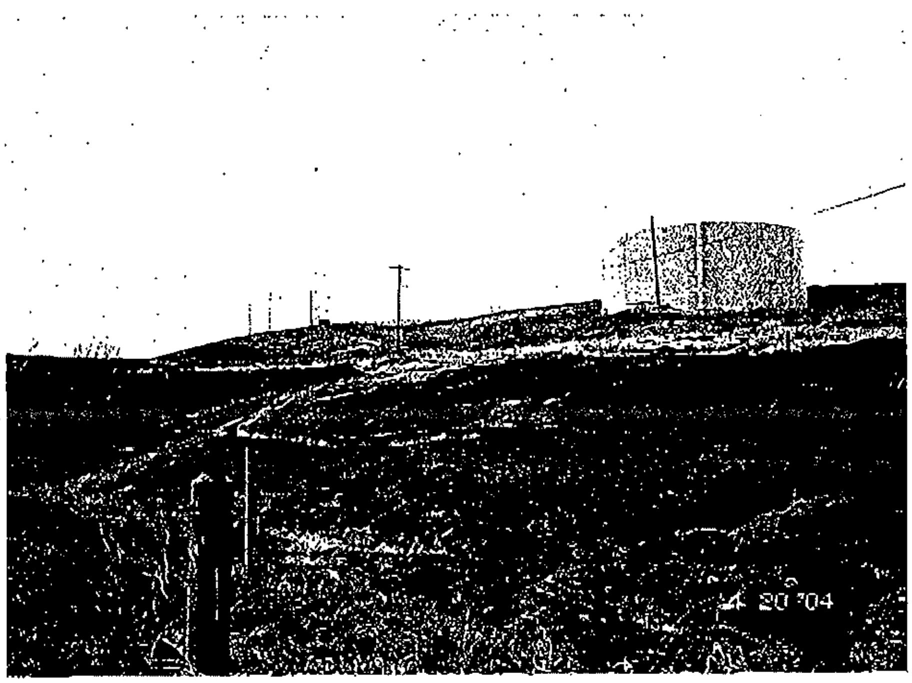
(unbonded) Water Well Constructor Certification:
I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.
WWC Number ______
Signed ______ Date ______

(bonded) Water Well Constructor Certification:
I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.
WWC Number 1606
Signed [signature] Date 8-5-98

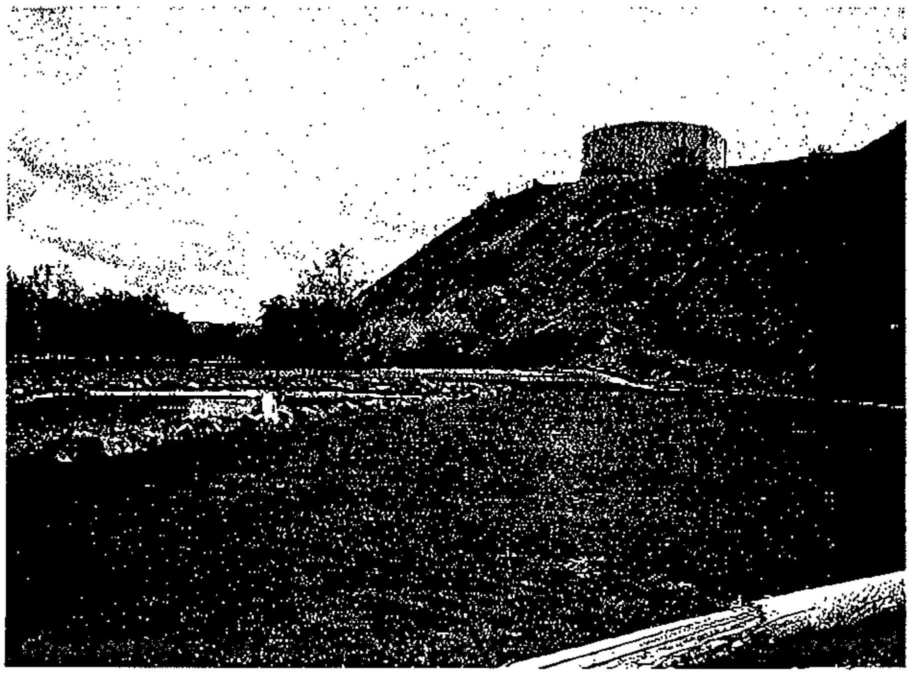
ORIGINAL & FIRST COPY-WATER RESOURCES DEPARTMENT SECOND COPY-CONSTRUCTOR THIRD COPY-CUSTOMER



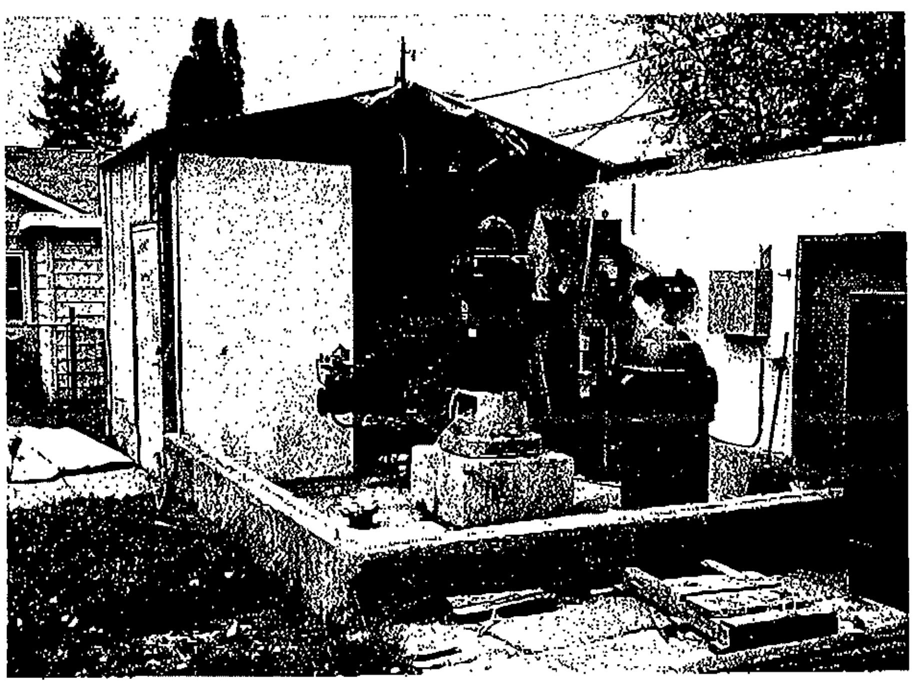
South Zone/Hwy 11 Two Million Gallon Reservoir



Middle Zone/SW 8th Street One Million Gallon Reservoir

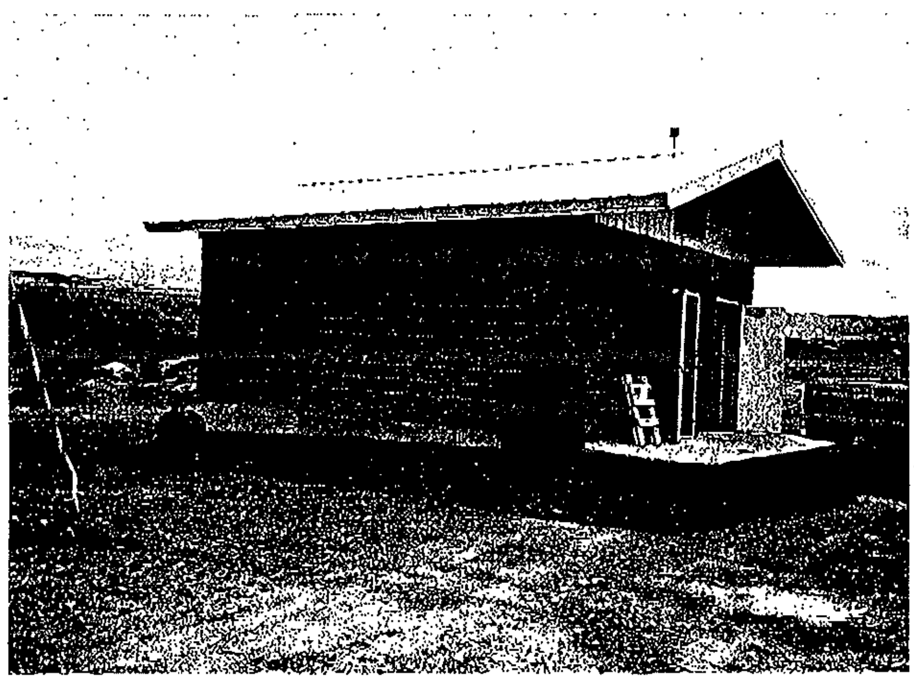


North Zone/Golf Course Two Million Gallon Reservoir



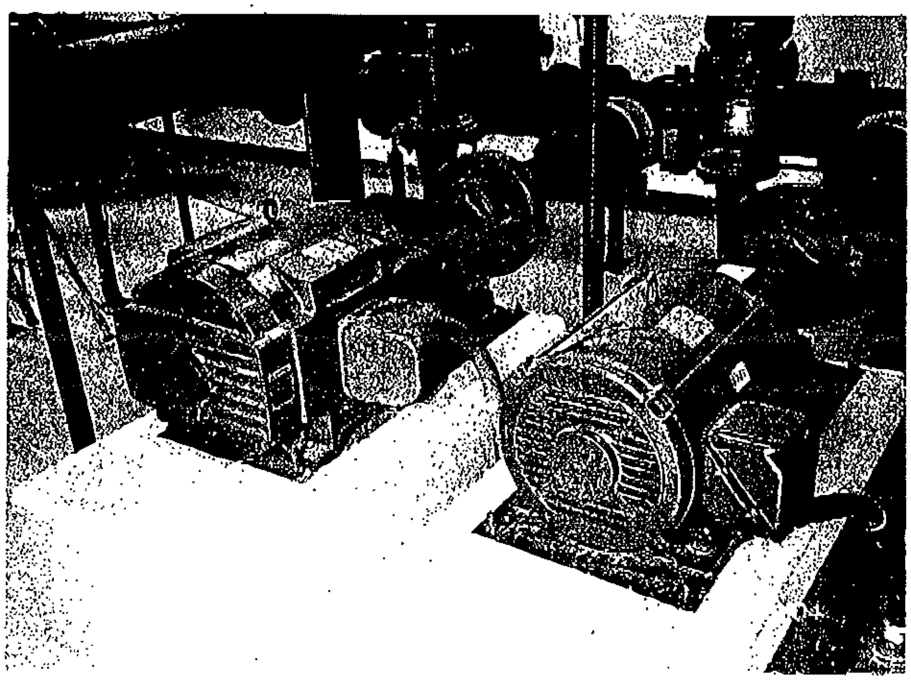
Well #6 Undergoing Pump Replacement

Well #9 Wellhead with Pitless Adapter Unit



Well #9 Wellhead, Booster Pump Station and Chlorination Room

Well #9 Chlorination Room



Well #9 Booster Pumps

APPENDIX C

ISO Fire Protection Report

RECEIVED MAR 28 1989

ISO COMMERCIAL RISK SERVICES, INC.

3000 EXECUTIVE PARKWAY SUITE 510 P.O. BOX 5126 SAN RAMON, CA 94583 ~~(415) 830-8778~~ FAX (415) 830-4691
510-830-8778

March 15, 1989

Honorable Dale Courtney, Mayor
City of Milton-Freewater
City Hall
P.O. Box 6
Milton-Freewater, Oregon 97862

Received May 1-1989 4 HRS 060
ISO revaluation occurs every 15 years with our population. 2004 will be our next.

Dear Mayor Courtney:

We wish to thank you, James Swayne, Howard Paulson, Bill Saager and others for the cooperation given to our representative during our survey. We have completed our evaluation of the fire insurance classification for your city and advise that the protection class improved to 4.

Formerly Class 6 applied; the new classification will result in a decrease in the property insurance premium calculations for many insured commercial properties within the City of Milton-Freewater. The new class will be effective May 1, 1989.

The purpose of our visit was to gather information needed to determine a fire insurance classification which may be used in the calculations of property insurance premium. This survey was not conducted for property loss prevention or life safety purposes and no life safety or property loss prevention recommendations will be made.

The change from Class 6 to Class 4 does not affect property insurance premium calculations for residential occupancies insured under Homeowners type policies and some other special schedule rated property. The property insurance premium calculations for sprinklered properties will decrease by about 10 percent. The change will affect typical mercantile properties to a degree depending upon the type of building construction, the hazard of occupancy and other property insurance premium calculations factors. The overall effect is usually about -22% for wood frame buildings, -25% for masonry buildings and -19% for fire-resistive buildings. However, variations in construction, occupancy and private protection can result in increases or decreases from this average.

The above estimates apply only for insurance companies using ISO property insurance premium calculations. However, numerous insurance companies use other than ISO property insurance premium calculations so that the effect of the change in class may be different for their policy holders.

RECEIVED MAR 26 [illegible]

The city classification applies to properties with a needed fire flow of 3500 gpm or less. The private and public protection at properties with larger needed fire flows are individually evaluated, and may vary from the district classification.

We are attaching a copy of our Grading Sheet and the results of the hydrant flow tests witnessed during our survey. Extra copies of this letter and attachments are also enclosed so that you may distribute them to other interested parties, if you desire to do so.

If you have any questions concerning the new classification, or the resulting change in premium calculations, please let us know.

Very truly yours,

FOR JBCT

Joseph B.C. Twyman
Supervisor - Survey Services

Enclosures

jbct:vs

RECEIVED MAR 28 1989

Grading Sheet for MILTON-FREEWATER, OREGON

Public Protection Class: 4 Surveyed: 4/87

	Grading Credits	Maximum Schedule Credits
Receiving and Handling Fire Alarms.....	% 6.80	10%
Fire Department......................	% 26.72	50%
Water Supply.........................	% 38.03	40%
*Divergence..........................	% - 8.33	
Total:	% 63.22	100%

The Public Protection Class is based on the total percentage credit as follows:

Class	%
1	90.00 or more
2	80.00 to 89.99
3	70.00 to 79.99
4	60.00 to 69.99
5	50.00 to 59.99
6	40.00 to 49.99
7	30.00 to 39.99
8	20.00 to 29.99
9	10.00 to 19.99
10	0 to 9.99

*Divergence is a reduction in credit to reflect a difference in the relative credits for Fire Department and Water Supply.

The above classification has been developed for use in property insurance premium calculations.

RECEIVED MAR 28 1989

ISO COMMERCIAL RISK SERVICES, INC.

HYDRANT FLOW DATA SUMMARY

City Milton-Freewater State Ca Zip 97862 Witnessed by J. Mothershead Date April 8, 1987

TEST NO.	TYPE DIST.*	TEST LOCATION	SERVICE	FLOW-GPM INDIVIDUAL HYDRANTS			FLOW-GPM TOTAL	PRESSURE PSI STATIC	PRESSURE PSI RESID.	FLOW AT 20 PSI NEEDED **	FLOW AT 20 PSI AVAIL.	REMARKS
1	Comm	S. 15th & Main	South	800	790		1590	89	53	6000 2500	4400	
2	Res	S. 13th & Davis	South	500	530		1030	42	37	1000	2300	
3	Comm	S. 6th & Main	South	980	840		1820	77	70	1750	5600	
4	Comm	S. 2nd & Dehaven	South	980	1060		2040	89	80	3000	6100	
5	Comm	Broadway E. of Main	North	820	870		1690	68	60	4000 2250	4400	
6	Comm	N. 6th & Evans	North	1030	1060		2090	80	78	5500 3000	13100	
7	Comm	N. 7th & Lamb	North	980	1020		2000	80	75	2500	7700	
8	Res	N. Lamb s. of Powell Rd.	North	920	950		1870	89	74	1250	4300	
9	Comm	N. 8th & Main	North	530	560		1090	83	79	3000	4800	
10	Comm	N. 5th & Russell	North	650	750		1400	73	70	1750	6600	
11	Comm Res	N. Elizabeth S. of 6th Ct	North	1060	990		2050	76	71	4500 1000	7600	
12	Comm	N. 10th & Elizabeth	North	290	290		580	81	78	2500	3000	
13	Comm	N. Columbia N. of 1st	North	800	840		1640	65	58	2500	4500	

THE ABOVE LISTED NEEDED FIRE FLOWS ARE FOR PROPERTY INSURANCE PREMIUM CALCULATIONS ONLY AND ARE *NOT* INTENDED TO PREDICT THE MAXIMUM AMOUNT OF WATER REQUIRED FOR A LARGE SCALE FIRE CONDITION. THE AVAILABLE FLOWS ONLY INDICATE THE CONDITIONS THAT EXISTED AT THE TIME AND AT THE LOCATION WHERE TESTS WERE WITNESSED.

* Comm = Commercial; Res = Residential.

** Needed is the rate of flow for a specific duration for a full credit condition. Needed Fire Flows greater than 3,500 gpm are **not** considered in determining the classification of the city when using the Fire Suppression Rating Schedule.

APPENDIX D

City Well Log and Pump Data

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the STATE ENGINEER, SALEM, OREGON 97310 within 30 days from the date of well completion.

RECEIVED
MAY 10 1971
STATE ENGINEER
SALEM, OREGON

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

UMAT 3960

State Well No. 5N/35-12 dac
State App. No. U-109
State Permit No. U-102

(1) OWNER:
Name: CITY OF MILTON - FREEWATER ORE.
Address: M-F ORE.

(2) TYPE OF WORK (check):
New Well ☐ Deepening ☐ Reconditioning ☒ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☐ Driven ☐
Cable ☒ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

(5) CASING INSTALLED:
Threaded ☒ Welded ☐ ?
12" Diam. from 0 ft. to 84 ft. Gage ?
PREVIOUSLY INSTALLED
" Diam. from ft. to ft. Gage

(6) PERFORATIONS:
Perforated? ☐ Yes ☐ No.
Type of perforator used: SEE LOG
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS:
Well screen installed? ☐ Yes ☐ No
Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(8) WATER LEVEL: Completed well.
Static level 202 ft. below land surface Date 3-15-71
Artesian pressure lbs. per square inch Date

(9) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? ☒ Yes ☐ No If yes, by whom? CONTRACTOR
Yield: 1484 gal./min. with 182 ft. drawdown after 24 hrs.
" " " "
" " " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water 62° Was a chemical analysis made? ☐ Yes ☒ No

(10) CONSTRUCTION:
Well seal—Material used: CEMENT
Depth of seal 84 ft.
Diameter of well bore to bottom of seal 12 in.
Were any loose strata cemented off? ☐ Yes ☒ No Depth
Was a drive shoe used? ☒ Yes ☐ No
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? ☐ Yes ☒ No Size of gravel:
Gravel placed from ft. to ft.

(11) LOCATION OF WELL:
County: UMATILLA Driller's well number #1
SE ¼ NE ¼ Section 12 T. 5N R. 35 E W.M.
Bearing and distance from section or subdivision corner: Begining @ the center of section 12, N. 850' Thence W. 250' to well #1

(12) WELL LOG:
Diameter of well below casing 12"
Depth drilled 656 ft. Depth of completed well 656 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level as drilling proceeds. Note drilling rates.

MATERIAL	From	To	SWL
WELL WAS ORIGINALLY DRILLED IN 1930S, REPORTED TO HAVE BEEN 651' ~~DEEP~~ ACTUAL DEPTH WAS 636' CASING HAD BEEN PERFORATED WE PRESSURE GROUTED THROUGH PERFORATIONS SHUT OFF SURFACE WATER ENTERING PERFORATIONS, MADE TEST NO LOSS OF WATER WITH HOLE FILLED TO TOP UNDER 50 PSI AFTER CEMENTING			
GREY BASALT	636	642	202
BLACK BASALT	642	656	202

Work started 1-21 1971 Completed 3-17 1971
Date well drilling machine moved off of well 3-16 1971

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] (signature) (Drilling Machine Operator) Date 3-31, 1971
Drilling Machine Operator's License No. 361

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
NAME CHARLES JUNGMANN DRILLING CO.
(Person, firm or corporation) (Type or print)
Address 125 REES AVE. W. W. WASH.
[Signed] (signature) (Water Well Contractor)
Contractor's License No. 236 Date 3-31, 1971

(USE ADDITIONAL SHEETS IF NECESSARY)

(Umat 5999)

RECEIVED
APR 11 1994
WATER RESOURCES DEPT.
SALEM, OREGON

5N/35E/12bb

STATE OF OREGON
WATER WELL REPORT
(as required by ORS 537.765)

(START CARD) # 53338

(1) OWNER: Well Number #1
Name City of Milton Freewater
Address PO BOX 6
City Milton Freewater State OR Zip 97862

(2) TYPE OF WORK:
☐ New Well ☐ Deepen ☒ Recondition ☐ Abandon

(3) DRILL METHOD:
☒ Rotary Air ☐ Rotary Mud ☐ Cable
☐ Other

(4) PROPOSED USE:
☐ Domestic ☐ Community ☐ Industrial ☐ Irrigation
☐ Thermal ☐ Injection ☒ Other Municipal

(5) BORE HOLE CONSTRUCTION:
Special Construction approval ☐ Yes ☒ No Depth of Completed Well 584 ft.
Explosives used ☐ Yes ☒ No Type ______ Amount ______

HOLE Diameter	From	To	SEAL Material	From	To	Amount sacks or pounds
12	0	584	NA			

How was seal placed: Method ☐ A ☐ B ☐ C ☐ D ☐ E
☐ Other
Backfill placed from ______ ft. to ______ ft. Material ______
Gravel placed from ______ ft. to ______ ft. Size of gravel ______

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:					☐	☐	☐	☐
					☐	☐	☐	☐
		N/A			☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Final location of shoe(s) ______

(7) PERFORATIONS/SCREENS:
☐ Perforations Method ______
☐ Screens Type ______ Material ______

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
		N/A				☐	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐

(8) WELL TESTS: Minimum testing time is 1 hour
☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
			1 hr.
	N/A		

Temperature of Water ______ Depth Artesian Flow Found ______
Was a water analysis done? ☐ Yes By whom ______
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other ______
Depth of strata: ______

(9) LOCATION OF WELL by legal description:
County Umatilla Latitude ______ Longitude ______
Township 5 Ⓝ or S. Range 35 Ⓔ or W. WM.
Section 12 NW ¼ NW ¼
Tax Lot 06500 Lot ______ Block ______ Subdivision ______
Street Address of Well (or nearest address) SE 9th & Mill ST.

(10) STATIC WATER LEVEL:
228 ft. below land surface. Date 3-29-94
Artesian pressure ______ lb. per square inch. Date ______

(11) WATER BEARING ZONES:
Depth at which water was first found 228

From	To	Estimated Flow Rate	SWL

(12) WELL LOG:
Ground elevation ______

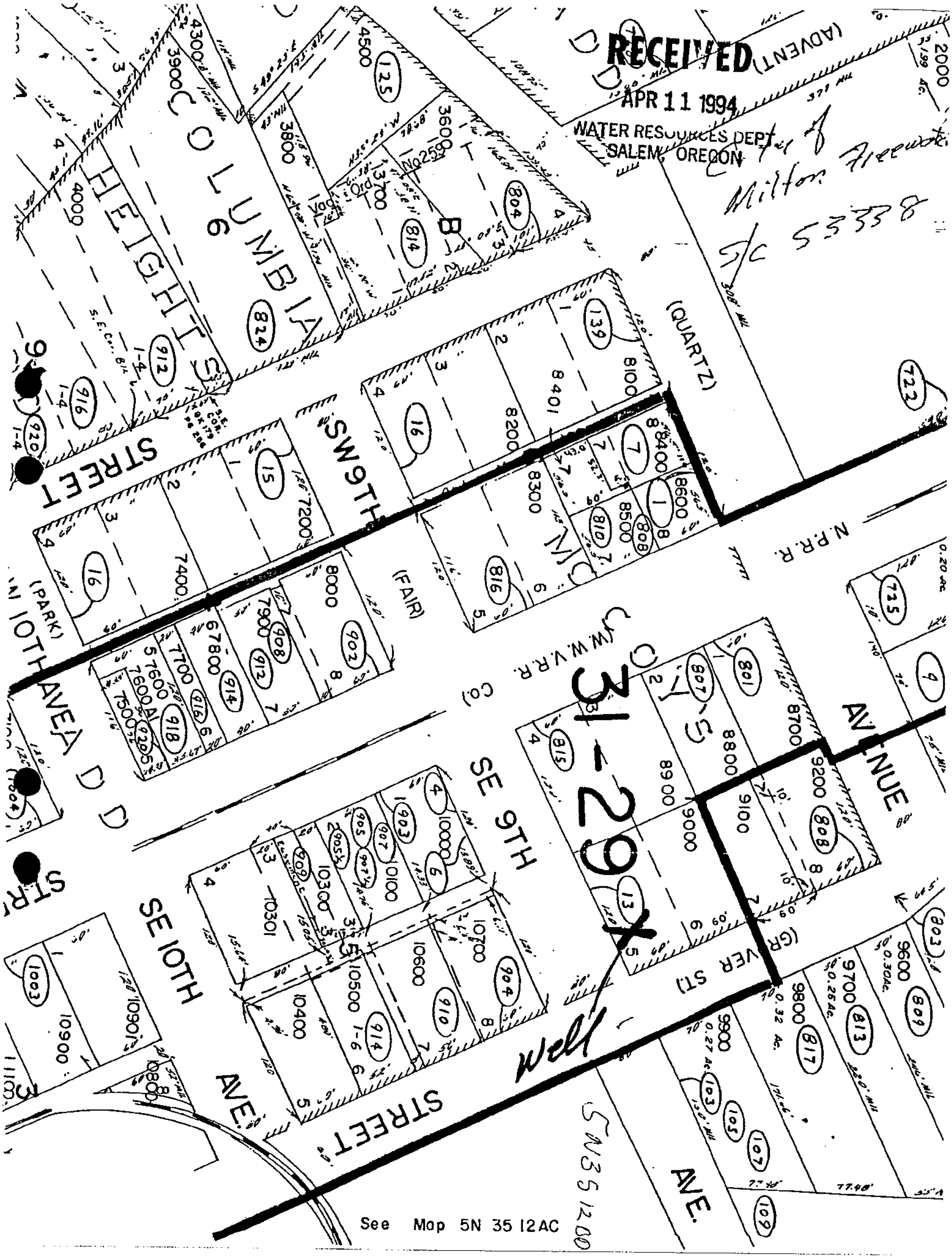
Material	From	To	SWL
Ran 12" Stabilizers down well to straighten for lowering of Turbine pump			
Cleaned well out To 584 ft.			
Stabilizers reamed off side of well @ 584 ft & is starting new hole			

Date started 3-8-94 Completed 3-29-94

(unbonded) Water Well Constructor Certification:
I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to my best knowledge and belief.
WWC Number ______
Signed ______ Date ______

(bonded) Water Well Constructor Certification:
I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.
WWC Number 259
Signed [signature] Date 3-31-94

ORIGINAL & FIRST COPY - WATER RESOURCES DEPARTMENT SECOND COPY - CONSTRUCTOR THIRD COPY - CUSTOMER 9809C 10/91



RECEIVED
APR 11 1994
WATER RESOURCES DEPT
SALEM, OREGON
City of Milton Freewater
G/C 5538
COLUMBIA HEIGHTS
(ADVENT)
(QUARTZ)
SW 9TH
STREET
(FAIR)
(PARK)
10TH AVE.
N.P.R.R.
W.W.V.R.R. CO.
31-29X
AVENUE
SE 9TH
SE 10TH
(GROVER ST.)
Well
STREET
AVE.
See Map 5N 35 12AC
5N 35 12 DD

IVED
1 1938
ST ENGINEER
SALEM, OREGON

3961 OBSERVATION WELL

5N/35-12F(1)
UMATILLA

Milton Freewater #1

Application No. U 109
Permit No. U 102
Well No. #1

G 5389

REPORT ON COMPLETION OF WELL

(Note: This report should be submitted to the State Engineer, Salem, Oregon, as soon as possible after the well is completed. If more than one well is covered by this permit, a separate report shall be filed for each)

Date of Report ______, 193__

#. 40' of Lot 5, Block 7, McCoy's Addition to Milton City, Oregon.
1. Location of well: S. W. ¼ of Section 12 Twp. 5 N Rge. 35 E. W. M.
2. Name of nearest natural surface stream Walla Walla River
3. Distance from well to that stream: 1000 feet.
4. If the well is less than 1300 feet from a natural surface stream, give the difference in elevation between the ground surface at the well and the lowest point in stream channel: 9.5 feet.
5. Date of beginning drilling or digging January 2, 1937
6. Date well was completed March 1, 1938

7. LOG OF MATERIALS ENCOUNTERED

Character of Material	Depth at which encountered	Thickness of stratum
	At surface	ft.
	ft.	ft.
(SEE SHEET ATTACHED)	ft.	ft.
	ft.	ft.
	ft.	ft.
	ft.	ft.
	ft.	ft.
	ft.	ft.
	ft.	ft.

Remarks:

WELL INFORMATION

8. Diameter of well 12" inches. Depth of well 652 feet.
9. Depth at which water was first encountered 90' feet.
10. Water level when completed: 87' feet below ground surface.
11. Additional information regarding well; such as soil conditions, quick sand, caves, obstructions, rock, etc.: See log attached.
This well for "standby" service only.

RECEIVED
JUN 4 1938
STATE ENGINEER
SALEM, OREGON

F(1)
5N/35-12 ~~(1)~~
UMATILLA

PUMP INFORMATION

12. Manufacturer of pump: Fairbanks-Morse & Company
13. Address: 1220 First Avenue South, Seattle, Washington
14. Data on name or base plate: #32523 - Seattle No.7316
6 Stage 12" Imp. 7472, Figure 6920, 1750 R.P.M.
Outside column 9" O. D., Length 150', Shaft 1 5/8" Dia.
15. Data on pump bowl assembly:
16. Size of pump: 12"
17. Rated capacity: 1000 gallons per minute. 80 pounds pressure
18. Rated speed: 1800 revolutions per minute. water to water hd.
19. Number of stages: 6
20. Size of intake pipe: 9"
21. Size of discharge pipe: 12"
22. Length of intake pipe: 150'
23. Length of discharge pipe: Direct into 12" city main
24. Suction lift: (difference in elevation between water surface in well and pump)
25. Discharge lift: (difference in elevation between pump and end of discharge line)
26. Depth of pump intake below ground surface: 187' feet.
27. Remarks: 187' to bottom of intake pipe

MOTOR OR ENGINE INFORMATION

28. Name of manufacturer: Fairbanks-Morse & Co.
29. Address: 1220 First Avenue South, Seattle, Washington
30. Type of motor or engine: 100 H.P., Morse Type, 1750 R.P.M., 3 phase, 60 cy., 440 volts, vertical ball bearing, hollow shaft squirrel cage.
31. Data on name or base plate:
32. Rated horsepower: 100
33. Rated speed of motor or engine: 1750 revolutions per minute.
34. Rated Capacity of Pump (with described motor)

g.p.m.		ft. head	
1000	g.p.m. at	305	ft. head
1200	g.p.m. at	256	ft. head
1250	g.p.m. at	240	ft. head
	g.p.m. at		ft. head
	g.p.m. at		ft. head

35. Remarks:

F(1)
5N/35-12 #1
UMATILLA CO

CAPACITY TEST

36. Date of test: April 22 37. Temperature of water 58 °F. or ____ °C.
38. Motor speed during test: ____
39. Test made by (weir, tank or other means): Orifice

(See report of Fa banks- se Engineer attached)

40. Pounds pressure	TOTAL HEAD	*Total lift in feet	Gallons per min.	°Feet to water level	□ Draw-down	+Time
____lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
____lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
____lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
____lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
____lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
____lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
____lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
____lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
____lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
____lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
____lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
____lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
____lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
____lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
____lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
____lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.
____lbs.,	Gauge at pump	Total___ft.___in.		ft.	ft.	M.

* Difference in elevation between water level in well and outlet of pump test line.
° Distance from ground level to water surface in well.
□ Distance water level is lowered during time interval.
\+ Hour and minute at which observation was made.

41. Installation will work efficiently under normal head of 305 ft.
42. Water is discharged into: 12" city water main
43. Was water lowered to pump intake by test? ____
44. Remarks: ____

GENERAL INFORMATION

45. Name of contractor or other party who drilled or dug well: A. A. Durand
Address: Walla Walla, Washington
46. Pump and motor were installed by: Carleton M. Mull, Fairbanks-Morse Co.
Address: Yakima, Washington
47. Capacity test was made by: Carlton M. Mull
Address: Yakima, Washington
48. General remarks: Checked by Mr. White, Engineer, Oregon Insurance Rating Bureau, Portland, Oregon

Report made by Milton City
(sign here)
Gus Ishaus[?]
Bus. Mgr.

G 5384

U-102

F(1)

5N/35-12

UMATILLA CO

LOG OF MILTON WELL - UMATILLA COUNTY

From 1 to 30 ft. gravel
30 to 37 " Cement & Gravel
37 to 46 " Gravel & Clay
46 to 60 " Black Rock
60 to 98 " Rock & Clay
98 to 115 " Black Rock
115 to 122 " Hard Black Rock
122 to 140 " Medium Rock
140 to 145 " " " Soft Red Brown
145 to 180 " " " Black
180 to 186 " Hard Black Rock
186 to 202 " Medium Grey Rock
202 to 212 " Soft " "
212 to 249 " Medium Brown Rock
249 to 256 " Hard Brown "
256 to 280 " Soft Brown Rock
280 to 367 " Medium Grey Rock
367 to 416 " " Black Rock
416 to 440 " " Grey "
440 to 450 " " Black "
450 to 651 " " Grey "

3N/35-12 ~~R41~~ F1(1)
UMATILLA

MILTON CITY, OREGON APRIL 22, 1938

Test made Fairbanks, Morse Turbine Pump

Pump #32523, Seattle No. 7316

6 Stage 12" Imp. -747-E Fig 6920 - 1750 R.P.M.

Outside column 9" O.D. Length 150 ft. shaft 1-5/8" Dia.

Capacity 1000 G.P.M. at Water to Water head 300 Ft.

Motor Fairbanks, Morse 100 H.P. Type HSZU - 1800 R.P.M.

Motor No.324047 - Fr.JL163B - 3 ph. 60 cycle 440 Volt.

118 Amps. F.Load Speed 1755 R.P.M.

Test Data:-Pump Started at 2:55 P.M.; Stopped at 5:30 P.M.

Length of air line below pump floor level 177' + 5'7" =182'7"

Draw down gauge before pumping = 37 lbs. = 85.5 ft.

Pumping at no pressure on discharge.

Draw gauge 10# = 23.1 Ft.

Pumping level 140 Ft.

Capacity thru 9.5" orifice in 12" O.D. Pipe 10" = 1400 G.P.M.

K. W. demand at power 1 mile distance 90 K.W. X 1.34 = 1201 H.P.

Discharge pressure 30# = 69.3 Ft.

Draw down gauge reading 14# = 32.25 Ft.

Capacity thru 9.5" orifice 8" = 1200 G.P.M.

Discharge pressure 50# = 115.5 Ft.

Draw down gauge 16 lbs = 36.98 Ft.

Discharge thru 9.5" orifice 7" = 1150 G. P. M.

Motor Speed 1762 - 1775 - 1760 R.P.M.

Motor In Put 127 Amps - 121 - 125 - P.Factor 90%

Discharge pressure 80 lbs. = 184.8 Ft.

Draw down gauge = 21 lbs. = 48.5 Ft.

Discharge thru 9.5" orifice 5-1/4" = 1000 G.P.M.

Motor Speed 1752 - 1754 - 1760 R. P. M.

Motor In Put 125 Amps - 124 - 122. P. Factor 88%

RECEIVED
OCT 15 1945
HYDROELECTRIC COMMISSION
OF OREGON

UMAT
3962

5N/35-12 F(2)
UMATILLA

OBSERVATION WELL

Application No. U 159
Permit No. U 150
Well No. #2

REPORT ON COMPLETION OF WELL

(Note: This report should be submitted to the State Engineer, Salem, Oregon, as soon as possible after the well is completed. If more than one well is covered by this permit, a separate report shall be filed for each)

Date of Report October 10, 1945

1. Location of well: SE ¼ of NW ¼ of Section 12 Twp. 5 N Rge. 35E, W. M.
2. Name of nearest natural surface stream Walla Walla River
3. Distance from well to that stream: 1,500 feet.
4. If the well is less than 1300 feet from a natural surface stream, give the difference in elevation between the ground surface at the well and the lowest point in stream channel: ______ feet.
5. Date of beginning drilling or digging May 6, 1944
6. Date well was completed ______

7. LOG OF MATERIALS ENCOUNTERED

Character of Material	Depth at which encountered	Thickness of stratum
Gravel	At surface	ft.
Gravel (cement)	28 ft.	42 ft.
Black Basalt	70 ft.	146 ft.
Brown Rock	216 ft.	14 ft.
Black & Brown Basalt	230 ft.	331 ft.
Gray Basalt	561 ft.	93 ft.
Black & Gray Basalt	654 ft.	67 ft.
Brown Basalt	721 ft.	40 ft.
Red & Gray Rock	761 ft.	4 ft.
~~Remarks~~ Black & Gray Basalt	765 - 902'	137 ft.

Remarks: 902' total depth of well. From 230' - 902' static water level was 105'.

WELL INFORMATION

8. Diameter of well ______ inches. Depth of well 902' feet.
9. Depth at which water was first encountered 230 feet.
10. Water level when completed: 105 feet below ground surface.
11. Additional information regarding well; such as soil conditions, quick sand, caves, obstructions, rock, etc.: Water first encountered at 57' depth of well with water level 17' 6" below ground level. Cased out, casing extending to a depth of 99'.

5N/35-12F(2)
UMATILLA

PUMP INFORMATION

12. Manufacturer of pump: Peerless Pump Company - Los Angeles, Calif.
13. Address:
14. Data on name or base plate: Serial No. 24875 Bottom bowls 260' column Size 12" MA. Stage 10., Type head 14B., Suction 10" Standard. Size discharge 10" Std.
15. Data on pump bowl assembly:
16. Size of pump: 12" MA
17. Rated capacity: 1,000 gallons per minute.
18. Rated speed: 1,800 RPM revolutions per minute.
19. Number of stages: 10
20. Size of intake pipe: 12
21. Size of discharge pipe: 10"
22. Length of intake pipe: 260' (Column)
23. Length of discharge pipe: 30'
24. Suction lift: (difference in elevation between water surface in well and pump) 170'
25. Discharge lift: (difference in elevation between pump and end of discharge line) Pumping against 65 lb. main pressure.
26. Depth of pump intake below ground surface: 260' feet.
27. Remarks:

MOTOR OR ENGINE INFORMATION

28. Name of manufacturer: U. S. Electric
29. Address: Los Angeles, Calif.
30. Type of motor or engine: C. F. U.
31. Data on name or base plate: Serial No. 49¢345., HP - 125., RPM - 1800., Frame 984A., Volts 2300., Phase 3., Cycle 60.
32. Rated horsepower: 125
33. Rated speed of motor or engine: 1800 revolutions per minute.

34. Rated Capacity of Pump (with described motor)	
	1000 g.p.m. at 400 ft. head
	g.p.m. at ft. head
	g.p.m. at ft. head
	g.p.m. at ft. head
	g.p.m. at ft. head

35. Remarks:

5N/35-12 F(2)
UMATILLA
#2

CAPACITY TEST

36. Date of test: 9-21-45 37. Temperature of water 55 °F. or ____ °C.
38. Motor speed during test: 1780 & 1785
39. Test made by (weir, tank or other means): 6" Orifice - calibrated.

40. Pounds pressure	TOTAL HEAD	*Total lift in feet	Gallons per min.	°Feet to water level	▫ Draw-down	+Time
101 lbs.,	Gauge at pump	Total 178 ft. ____ in.	986	107 ft.	71 ft.	11:30 M. A.M.
____ lbs.,	Gauge at pump	Total ____ ft. ____ in.		ft.	ft.	M.
60 lbs.,	Gauge at pump	Total 195 ft. ____ in.	1135	107 ft.	88 ft.	11:40A M.
____ lbs.,	Gauge at pump	Total ____ ft. ____ in.		ft.	ft.	M.
100 lbs.,	Gauge at pump	Total 172 ft. ____ in.	990	107 ft.	65 ft.	1:30P M.
____ lbs.,	Gauge at pump	Total ____ ft. ____ in.		ft.	ft.	M.
____ lbs.,	Gauge at pump	Total ____ ft. ____ in.		ft.	ft.	M.
____ lbs.,	Gauge at pump	Total ____ ft. ____ in.		ft.	ft.	M.
____ lbs.,	Gauge at pump	Total ____ ft. ____ in.		ft.	ft.	M.
____ lbs.,	Gauge at pump	Total ____ ft. ____ in.		ft.	ft.	M.
____ lbs.,	Gauge at pump	Total ____ ft. ____ in.		ft.	ft.	M.
____ lbs.,	Gauge at pump	Total ____ ft. ____ in.		ft.	ft.	M.
____ lbs.,	Gauge at pump	Total ____ ft. ____ in.		ft.	ft.	M.
____ lbs.,	Gauge at pump	Total ____ ft. ____ in.		ft.	ft.	M.
____ lbs.,	Gauge at pump	Total ____ ft. ____ in.		ft.	ft.	M.
____ lbs.,	Gauge at pump	Total ____ ft. ____ in.		ft.	ft.	M.
____ lbs.,	Gauge at pump	Total ____ ft. ____ in.		ft.	ft.	M.

* Difference in elevation between water level in well and outlet of pump test line. 107'
° Distance from ground level to water surface in well. 105' Static
▫ Distance water level is lowered during time interval.
+ Hour and minute at which observation was made.

41. Installation will work efficiently under normal head of 400 ft.
42. Water is discharged into: City water mains.

43. Was water lowered to pump intake by test? Drawn down to depth of 178'
44. Remarks: While running only. Returned to 107' static level when stopped.

GENERAL INFORMATION

45. Name of contractor or other party who drilled or dug well: A. A. Durand & Son
Address: Walla Walla, Wash.
46. Pump and motor were installed by: A. A. Durand & Son under supervision of B.M.Kunes Address: Peerless Pump Co. Los Angeles Calif.
47. Capacity test was made by: B. M. Kunes, Peerless Pump Co.
Address: Los Angeles, Calif.
48. General remarks:

Report made by ____________
(sign here)

STATE ENGINEER
Salem, Oregon

State Well No. 5N/35-12F(2)

County UMATILLA

Application No.

Water Level Record

OWNER: MILTON FREEWATER OWNER'S NO. #2

Description of measuring point:

Date	Water Level Feet (above) (below) Land Surface	DATE	WATER LEVEL	Date	Water Level Feet (above) (below) Land Surface	DATE	WATER LEVEL
9-21-45	105	11-55	140	10-58	152	2-62	167
9-17-51	132	12	140	3-59	142	3	167
3-54	138	1-56	140	5	152	6	182
4	138	2	142	7	170	8	187
5	135	3	140	8	165	12	183
6	147	5	144	12	165	1-63	176
7	155	6	155	2-60	175	2	178
9	136	7	164	4	160	3	176
10	132	8	155	6	175	4	172
11	135	10	160	7	184	6	197
12	148	10-57	163	11	173	8	202
1-55	136	11	160	12	170	9	203
2	133	12	158	1-61	168	11-18	185
3	134	4-58	165	3	165	12-21	180
4	134	5	166	6	180	1-20-64	178
5	150	7	170	7	175	2-24	175
6	147	8	165	11	170	3-17	175
9	142	9	165	1-62	169	4-27	170

REMARKS:

STATE ENGINEER
Salem, Oregon

State Well No. 5N/35-12F(2)

County UMATILLA

Application No.

Water Level Record

OWNER: MILTON-FREEWATER OWNER'S NO. #2

Description of measuring point:

Date	Water Level Feet ~~(above)~~ (below) Land Surface	Remarks	Date	Water Level Feet (above) (below) Land Surface	Remarks
5-25-64	172				
6-22	180				
7-13	195				
8-24	194				
10-26	194				
11-23	188				
12-21	182				

REMARKS:

STATE ENGINEER
Salem, Oregon

State Well No. 5/35-12F2

County Umatilla

Application No.

Chemical Analysis

OWNER City of Milton-Freewater OWNER'S NO. 2

ANALYST U S G S Address

Date of Collection Nov. 18, 1946

Point of Collection

	P.P.M.	E.P.M.
Silica (SiO_2)		
Iron (Fe) Total	0.0	
Manganese (Mn)		
Calcium (Ca)	17.	
Magnesium (Mg)	7.4	
Sodium (Na)	33.	
Potassium (K)		
Bicarbonate (HCO_3)	104.	
Carbonate (CO_3)		
Sulfate (SO_4)	9.9	
Chloride (Cl)	5.8	
Fluoride (F)	0.3	
Nitrate (NO_3)	0.2	
Boron (B)		
Dissolved Solids	106.	
Hardness as $CaCO_3$	73.	
Specific Conductance (Micromhos at 25°C)	18.	
pH		
Percent Sodium	30.	
Sodium Absorption Ratio (S.A.R.)		
CLASS		

State Printing 86818

WELL INFORMATION - WELL LOG	SUPPLY NAME: MILTON-FREEWATER ID NUMBER : 4100522

5N/35 - 2J(1)
UMATILLA

RECEIVED
DEC 30 1946
STATE ENGINEER
SALEM, OREGON

Milton Freewater

Application No. U 101
Permit No. U 172
Well No. 3

REPORT ON COMPLETION OF WELL

(Note: This report should be submitted to the State Engineer, Salem, Oregon, as soon as possible after the well is completed. If more than one well is covered by this permit, a separate report shall be filed for each)

Date of Report December 28, 1946

1. Location of well: N.W.1/4 of S.E1/4 of Section 2 Twp. 5 Rge. 35 E, W. M.
2. Name of nearest natural surface stream Walla Walla River
3. Distance from well to that stream: 2670 feet.
4. If the well is less than 1300 feet from a natural surface stream, give the difference in elevation between the ground surface at the well and the lowest point in stream channel: feet.
5. Date of beginning drilling or digging January 27, 1946
6. Date well was completed June 1, 1946

7. LOG OF MATERIALS ENCOUNTERED

Character of Material	Depth at which encountered	Thickness of stratum
Gravel	At surface	40 ft.
Solid Rock	40 ft.	3 ft.
Black Basalt	43 ft.	133 ft.
Crevice and green shale	176 ft.	1 ft.
Black Basalt	[illegible] ft.	62 ft.
Brown Rock	239 ft.	10 ft.
Black Basalt	249 ft.	14 ft.
Brown Rock	263 ft.	24 ft.
Black Basalt	287 ft.	201 ft.
Loose grey Stone	488 ft.	3 ft.
Hard black basalt	491 ft.	47 ft.
Black & brown Rock	539 ft.	13 ft.

Remarks: Some crevices at 209-218 feet; brown rock caved at 285 feet.

WELL INFORMATION

8. Diameter of well 16" I.D. inches. Depth of well 550 feet.
9. Depth at which water was first encountered 60 feet.
10. Water level when completed: 50 feet below ground surface.
11. Additional information regarding well; such as soil conditions, quick sand, caves, obstructions, rock, etc.: 20" casing to depth of 43 feet. 16" casing inside of 20" and to depth of 100 feet below surface. Cement seal between 20" and 16" casing at 20-43 feet. Balance filled with cuttings.

Attatchment

NC

City Well No. 3

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the STATE ENGINEER, SALEM, OREGON 97310 within 30 days from the date of well completion.

RECEIVED
MAR 10 1969
STATE ENGINEER
SALEM, OREGON

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

UMAT 3924

State Well No. 5N/35-2da

State Permit No. 6172

(1) OWNER:
Name MILTON CITY ORE.
Address MILTON FREEWATER ORE.

(2) TYPE OF WORK (check):
New Well ☐ Deepening ☐ Reconditioning ☒ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☐ Driven ☐
Cable ☒ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

(5) CASING INSTALLED: Threaded ☐ Welded ☐
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

(6) PERFORATIONS: Perforated? ☐ Yes ☐ No.
Type of perforator used
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS: Well screen installed? ☐ Yes ☐ No
Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(8) WATER LEVEL: Completed well.
Static level 130 ft. below land surface Date 1-27-69
Artesian pressure lbs. per square inch Date

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? ☐ Yes ☐ No If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "
Bailer test 180 gal./min. with 8 ft. drawdown after 2 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? ☐ Yes ☒ No

(10) CONSTRUCTION:
Well seal—Material used CEMENT - BENTONITE
Depth of seal 105 ft.
Diameter of well bore to bottom of seal 16 in.
Were any loose strata cemented off? ☐ Yes ☒ No Depth
Was a drive shoe used? ☐ Yes ☐ No
Did any strata contain unusable water? ☐ Yes ☐ No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? ☐ Yes ☒ No Size of gravel:
Gravel placed from ft. to ft.

(11) LOCATION OF WELL:
County UMATILLA Driller's well number
NE ¼ SE ¼ Section 2 T. 5 R. 35 EAST W.M.
Bearing and distance from section or subdivision corner

(12) WELL LOG: Diameter of well below casing 16
Depth drilled 575 ft. Depth of completed well 575 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level as drilling proceeds. Note drilling rates.

MATERIAL	From	To	SWL
BLACK BASALT	535	575	40

Work started 12-19 1969 Completed 2-4 1969
Date well drilling machine moved off of well 2-4- 1969

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] William H. Jungmann Date 2-4 1969
(Drilling Machine Operator)
Drilling Machine Operator's License No. 230

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
NAME CHARLES JUNGMANN DRILLING CO.
(Person, firm or corporation) (Type or print)
Address 105 REES AVE W. W. WASH.
[Signed] Charles Jungmann
(Water Well Contractor)
Contractor's License No. 236 Date 2-24 1969

(USE ADDITIONAL SHEETS IF NECESSARY)

City Well No. 3

5N/35E/2da

5.

STATE OF OREGON
WATER WELL REPORT
(as required by ORS 537.765)

Umat 5786

RECEIVED MAR - 8 1993 WATER RESOURCES DEPT. SALEM, OREGON

(START CARD) # U-26405

Well Number USM ID# 1161 / POD 35764

(1) OWNER:
Name CITY OF MILTON - FREEWATER
Address 722 MAIN
City MILTON - FREEWATER State OR. Zip 98762

(2) TYPE OF WORK: TROUBLESHOOT - TEST
☐ New Well ☐ Deepen ☐ Recondition ☐ Abandon

(3) DRILL METHOD:
☐ Rotary Air ☐ Rotary Mud ☒ Cable
☐ Other

(4) PROPOSED USE:
☐ Domestic ☒ Community ☐ Industrial ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other

(5) BORE HOLE CONSTRUCTION:
Special Construction approval ☐ Yes ☒ No Depth of Completed Well 596 ft.
Explosives used ☐ Yes ☒ No Type ______ Amount ______

HOLE Diameter	From	To	SEAL Material	From	To	Amount sacks or pounds

How was seal placed: Method ☐ A ☐ B ☐ C ☐ D ☐ E
☐ Other
Backfill placed from ____ ft. to ____ ft. Material ______
Gravel placed from ____ ft. to ____ ft. Size of gravel ______

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Final location of shoe(s) ______

(7) PERFORATIONS/SCREENS:
☐ Perforations Method ______
☐ Screens Type ______ Material ______

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
						☐	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐

(8) WELL TESTS: Minimum testing time is 1 hour
☒ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
450 GPM	~~58~~		1 hr.
450 GPM	51'		4 HRS.

Temperature of Water 58° Depth Artesian Flow Found ______
Was a water analysis done? ☐ Yes By whom ______
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☒ Other GAS.
Depth of strata: 260' - 300'

(9) LOCATION OF WELL by legal description:
County UMATILLA Latitude ______ Longitude ______
Township 5 N or S. Range 35 E or W. WM.
Section 2 NE ¼ SE ¼
Tax Lot 5401 Lot ______ Block ______ Subdivision ______
Street Address of Well (or nearest address) NE 1ST & RUSSELL

(10) STATIC WATER LEVEL:
182 ft. below land surface. Date 2-12-93
Artesian pressure ______ lb. per square inch. Date ______

(11) WATER BEARING ZONES:

Depth at which water was first found ______

From	To	Estimated Flow Rate	SWL

(12) WELL LOG:
Ground elevation ______

Material	From	To	SWL
A BRIDGE COMPOSED OF ROCK - CEMENT BLOCKS - AND A CAP OF 10 SACKS NEAT CEMENT WAS INSTALLED AT 360' TO ISOLATE THE GAS AND UPPER H2O ZONE. THE UPPER ZONE WAS THEN TEST PUMPED FOR 4 HRS AT 450 GPM. WE HAD STEADY DRAWDOWN TO 233' AND CONTINUOUS GAS IN DISCHARGE. BRIDGE WAS THEN DRILLED OUT AND HOLE CLEANED TO BOTTOM, 596'.			

Date started 2-5-93 Completed 2-26-93

(unbonded) Water Well Constructor Certification:
I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to my best knowledge and belief.

WWC Number ______
Signed ______ Date ______

(bonded) Water Well Constructor Certification:
I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.

WWC Number 1608
Signed [signature] Date 3-1-93

STATE ENGINEER
Salem, Oregon

UMAT 3930

OBSERVATION WELL
Well Record

STATE WELL NO. 5/35-2 dad N
COUNTY UMATILLA
APPLICATION NO.

OWNER: Milton-Freewater

MAILING ADDRESS:

LOCATION OF WELL: Owner's No. 3

CITY AND STATE:

...¼ ...¼ Sec. ... T. ... N. S., R. ... E. W., W.M.

Bearing and distance from section or subdivision corner

Altitude at well 1,010±

Section

TYPE OF WELL: Drilled Date Constructed

Depth drilled 550 Depth cased 100

CASING RECORD:

20-16 inch

FINISH:

AQUIFERS:
Basalt

WATER LEVEL:

50 feet below land surface, June, 1946

PUMPING EQUIPMENT: Type Turbine H.P.
Capacity 1,500 G.P.M.

WELL TESTS:
Drawdown ... ft. after ... hours ... G.P.M.
Drawdown ... ft. after ... hours ... G.P.M.

USE OF WATER Public Supply Temp. ... °F. ..., 19...
SOURCE OF INFORMATION USGS
DRILLER or DIGGER
ADDITIONAL DATA:
Log X Water Level Measurements ... Chemical Analysis ... Aquifer Test ...

REMARKS:

State Printing 89316

STATE ENGINEER
Salem, Oregon

State Well No. 5/35-2dad

County UMATILLA

Application No.

Well Log

Owner: Milton-Freewater Owner's No. 3

Driller: George Scott Date Drilled 1946

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Recent alluvium and old gravels of Pleistocene a-			
age:			
Gravel with clay	0	43	43
Columbia River basalt:			
Basalt, black	43	79	36
Basalt, reddish brown	79	88	9
Basalt, black, brown, and gray, hard	88	131	43
Basalt, black with crevices containing			
"greenish shale" at 176, 209, and 218 ft.	131	239	108
Basalt, brown and black	239	467	228
Basalt, gray and black, broken, loose	467	492	25
Basalt, black	492	538	46
Basalt, black, porous	538	550	12

Umatilla

5N/35-2XD

237

dod

Oregon State Board of Health

SANITARY ENGINEERING LABORATORY

REPORT OF MINERAL ANALYSIS OF WATER

Location of source Milton-Freewater Description of source Pump 3

Analysis by MHP Date 11/12/52 Collected by ______ Date 6/25/52

RESULTS

	Parts per million
Turbidity	1
Color: Apparent ______ True	3
Odor: Hot ______ Cold	
Total Solids	164
Loss on Ignition	67
Silicon (SiO_2)	59
Chloride (Cl)	9.5
Sulfate (SO_4)	6.2
Calcium (Ca)	18
Magnesium (Mg)	11
Aluminum (Al)	0
Orthophosphates (PO_4)	.07
Metaphosphates $(PO_3)_6$	
Alkalinity (as $CaCO_3$): Carbonate	0
Bicarbonate	88
Hardness (as $CaCO_3$)	81
Sodium ~~and Potassium~~ (as Na)	15
Iron (Fe)	.15
Manganese (Mn)	0
Fluoride (F)	.1
Carbon Dioxide (CO_2)	2.9

pH 7.9

Remarks

PHF-10

STATE ENGINEER
Salem, Oregon

State Well No. 5/35-2J(1)

County UMATILLA

Application No.

Water Level Record

OWNER: MILTON FREEWATER OWNER'S NO. #3

Description of measuring point:

Date	Water Level Feet ~~(above)~~ (below) Land Surface	DATE	WATER LEVEL	Date	Water Level Feet ~~(above)~~ (below) Land Surface	Remarks
6-46	50	10-55	80	7-61	83	
2-26-53	78	2-56	82	2-24-64	114	
2-54	98	5	78	3-17	109	
3-15	84	6	92	4-20	108	
3-30	105	7	105	5-18	106	
4	80	8	96	6-19	119	
5	78	11	85	7-6	129	
6	85	12	95	9-21	133	
8	90	1-57	88	10-26	132	
10-10	90	2	88	11-23	123	
10-30	86	3	84	12-21	116.6	
2-55	78	5-58	99			
3	78	10	98			
4	75	11	90			
5	78	12	86			
6	90	3-59	80			
8	92	5	90			
9	85	4-61	99			

REMARKS:

State Printing 89314

STATE ENGINEER
Salem, Oregon

UMAT 3934

Well Record

STATE WELL NO. 5N/35-2H(1)
COUNTY Umatilla
APPLICATION NO. U- 808

OWNER: Milton-Freewater

MAILING ADDRESS:

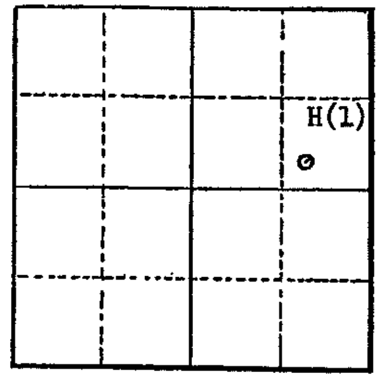
LOCATION OF WELL: Owner's No. 4

CITY AND STATE: Milton-Freewater, Oregon

SE ¼ NE ¼ Sec. 2 T. 5 N. ~~S~~, R. 35 E. ~~W~~., W.M.

Bearing and distance from section or subdivision corner N.58°52'W. 917' from E½ cor. of sec. 2

Altitude at well



Section 2

TYPE OF WELL: Drilled Date Constructed 1928

Depth drilled 374' Depth cased

CASING RECORD:
8 inch

FINISH:

AQUIFERS:
Basalt

WATER LEVEL:

PUMPING EQUIPMENT: Type Turbine H.P.
Capacity G.P.M.

WELL TESTS:
Drawdown ft. after hours G.P.M.
Drawdown ft. after hours G.P.M.

USE OF WATER Municipal Temp. °F. , 19
SOURCE OF INFORMATION U- 717
DRILLER or DIGGER
ADDITIONAL DATA:
Log NA Water Level Measurements Chemical Analysis Aquifer Test

REMARKS:

Umatilla

5N/35-2H

Oregon State Board of Health

SANITARY ENGINEERING LABORATORY

REPORT OF MINERAL ANALYSIS OF WATER

Location of source Milton-Freewater Description of source Pump 4

Analysis by MHP Date 11/12/54 Collected by Date 6/25/54

RESULTS

	Parts per million
Turbidity	5
Color: Apparent / True	4
Odor: Hot / Cold	
Total Solids	150
Loss on Ignition	65
Silicon (SiO_2)	41
Chloride (Cl)	15
Sulfate (SO_4)	5.4
Calcium (Ca)	14
Magnesium (Mg)	8.5
Aluminum (Al)	0
Orthophosphates (PO_4)	.35
Metaphosphates $(PO_3)_6$	
Alkalinity (as $CaCO_3$): Carbonate	0
Bicarbonate	49
Hardness (as $CaCO_3$)	61
Sodium and Potassium (as Na)	10
Iron (Fe)	.55
Manganese (Mn)	0
Fluoride (F)	.1
Carbon Dioxide (CO_2)	1.6

pH 7.8

Remarks

PHE-10

STATE ENGINEER
Salem, Oregon

UMAT
3909

Well Record

STATE WELL NO. 5N/35-1E(2)
COUNTY Umatilla
APPLICATION NO. U- 809

OWNER: City of Milton-Freewater MAILING ADDRESS:

LOCATION OF WELL: Owner's No. 5 CITY AND STATE: Milton-Freewater, Oregon

SW ¼ NW ¼ Sec. 1 T. 5 N. R. 35 E. W.M.

Bearing and distance from section or subdivision corner N. 32°2'E. 365.5' from W¼ cor. of sec. 1 to a 2" iron pipe, thence S.50°35'W. 31.5' to the well.

Altitude at well 995'

E(2)

Section 1

TYPE OF WELL: Drilled Date Constructed 1936

Depth drilled 502' Depth cased 212'

CASING RECORD:
18 inch set from 0 to 40 feet
12 inch set from 40 to 212 feet

FINISH:

AQUIFERS:
Basalt from 435 to 502 feet

WATER LEVEL:
67 feet (10/5/54)
120 feet (5/1/57)

PUMPING EQUIPMENT: Type Peerless turbine H.P. 150
Capacity 1200 G.P.M.

WELL TESTS:
Drawdown 47 ft. after hours 750 G.P.M.
Drawdown ft. after hours G.P.M.

USE OF WATER Municipal Temp. °F. , 19
SOURCE OF INFORMATION USGS U-718
DRILLER or DIGGER A.A. Durand & Son
ADDITIONAL DATA:
Log X Water Level Measurements X Chemical Analysis Aquifer Test

REMARKS:

STATE ENGINEER
Salem, Oregon

State Well No. 5N/[illegible]-1E(2)
County UMATILLA
Application No. U809

Well Log

Owner: Milton-Freewater Owner's No. 5

Driller: A. A. Durand & Son Date Drilled 1936

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Soil	0	3	3
Gravel and boulders, partly cemented & partly loose	3	80	77
Clay	80	90	10
Boulders and gravel	90	135	45
Clay and sand	135	145	10
Gravel and boulders, loose	145	160	15
Basalt, black, hard	160	245	85
Basalt, red porous	245	290	45
Basalt, blue and black hard	290	405	115
Basalt, red	405	435	30
Basalt, black, water bearing	435	502	67

Umatilla 5N/35-1E(2)

Oregon State Board of Health

SANITARY ENGINEERING LABORATORY

REPORT OF MINERAL ANALYSIS OF WATER

Location of source Milton-Freewater Description of source Pump 65

Analysis by MIP Date 11/12/53 Collected by ______ Date 6/25/53

RESULTS

	Parts per million
Turbidity	5
Color: Apparent ______ True	3
Odor: Hot ______ Cold	
Total Solids	149
Loss on Ignition	58
Silicon (SiO_2)	48
Chloride (Cl)	7.8
Sulfate (SO_4)	3.7
Calcium (Ca)	15
Magnesium (Mg)	6.5
Aluminum (Al)	0
Orthophosphates (PO_4)	.15
Metaphosphates $(PO_3)_6$	
Alkalinity (as $CaCO_3$): Carbonate	0
Bicarbonate	70
Hardness (as $CaCO_3$)	65
Sodium [illegible] (as Na)	14
Iron (Fe)	.13
Manganese (Mn)	0
Fluoride (F)	.1
Carbon Dioxide (CO_2)	2.3

pH 7.8

Remarks ______

PHE-10

STATE ENGINEER
Salem, Oregon

State Well No. 5N/35-1E(2)

County UMATILLA

Application No. U-809

Water Level Record

OWNER: MILTON-FREEWATER OWNER'S NO.

Description of measuring point: MOUNT HOLE ON NE CORNER OF WELL 1.5' ABOVE L.S.D.

Date	Water Level Feet (above) (below) Land Surface	Remarks	Date	Water Level Feet (above) (below) Land Surface	Remarks DATE	WATER LEVEL
11-9-61	101.21	RD&WSB	1-56	80	3-58	95
5-54	65		2	74	4	95
6	83		3	80	7	102
8	85		4	82	8	100
9	67		5	78		
10	73		10	89		
11	76		11	80		
12	72		12	80		
1-55	75		1-57	80		
2	70		2	81		
3	70		3	76		
4	68		4	80		
5	71		9	102		
8	86		10	98		
9	76		11	95		
10	74		12	86		
11	74		1-58	95		
12	82		2	95		

REMARKS:

STATE ENGINEER
Salem, Oregon

UMAT 3929

OBSERVATION WELL
Well Record

STATE WELL NO. 5N/35-2L(1)
COUNTY Umatilla
APPLICATION NO. U-511

OWNER: City of Milton Freewater
MAILING ADDRESS: Milton Freewater

LOCATION OF WELL: Owner's No. #6
CITY AND STATE:

NE 1/4 SW 1/4 Sec. 2 T. 5 N., R. 35 E., W.M.

Bearing and distance from section or subdivision corner

Altitude at well

Section 2

TYPE OF WELL: Drilled Date Constructed 12-22-50

Depth drilled 952' Depth cased 61'

CASING RECORD:
16 inch
12 inch

FINISH:

AQUIFERS:
Basalt

WATER LEVEL:
71' (12-22-50)

PUMPING EQUIPMENT: Type Cook H.P. 125
Capacity 1500 G.P.M.

WELL TESTS:
Drawdown ft. after hours G.P.M.
Drawdown ft. after hours G.P.M.

USE OF WATER Municipal Temp. °F. , 19
SOURCE OF INFORMATION U-511
DRILLER or DIGGER Geo. Scott
ADDITIONAL DATA:
Log ✓ Water Level Measurements ✓ Chemical Analysis ✓ Aquifer Test

REMARKS:

State Printing 69318

Umatilla 5N/35-2[illegible]

Oregon State Board of Health 238[illegible]

SANITARY ENGINEERING LABORATORY

REPORT OF MINERAL ANALYSIS OF WATER

Location of source ~~Milton-Freewater~~ Description of source [illegible]

Analysis by MHP Date 11/1?/[illegible] Collected by ______ Date 6/?5/5[illegible]

RESULTS

	Parts per million
Turbidity	4
Color: Apparent ______ True	4
Odor: Hot ______ Cold	
Total Solids	[illegible]
Loss on Ignition	50
Silicon (SiO_2)	[illegible]
Chloride (Cl)	4.0
Sulfate (SO_4)	5.6
Calcium (Ca)	36
Magnesium (Mg)	8.5
Aluminum (Al)	Trace (less than .05 ppm)
Orthophosphates (PO_4)	.05
Metaphosphates $(PO_3)_6$	
Alkalinity (as $CaCO_3$): Carbonate	0
Bicarbonate	[illegible]
Hardness (as $CaCO_3$)	[illegible]
Sodium (as Na)	19
Iron (Fe)	.35
Manganese (Mn)	0
Fluoride (F)	.2
Carbon Dioxide (CO_2)	1.8

pH 8.0

Remarks ______

PHS-10

STATE ENGINEER
Salem, Oregon

State Well No. 5N/35-2L(1) caa

County UMATILLA

Application No.

Water Level Record

OWNER: Milton Freewater OWNER'S NO. #6

Description of measuring point:

Date	Water Level Feet (below) Land Surface	DATE	WATER LEVEL	Date	Water Level Feet (below) Land Surface	Remarks
4-54	78	5-57	76	6-60	95	
10	95	9	82	8	85	
11	88	10	80	10	82	
12	85	11	72	3-61	97	
1-55	85	12	78	4	95	
2	82	1-58	80	11	100	
3	82	4	74	12	95	
4	78	9	85	1-62	100	
5	74	4-59	97	2-	98	
7	82	8	88	9	110	
12	86	9	85	11	105	
1-56	80	10	85	12	105	
2	76	11	84	1-63	100	
3	76	12	85	2	98	
4	73	1-60	87	5	110	
5	70	2	80	6	113	
8	80	3	100	8	119	
9	74	4	92			

REMARKS:

State Printing 89314

City Well No. 6

NO[illegible] WATER WELL CONTRACTOR: The original and first copy of this report are to be filed with the STATE ENGINEER, SALEM, OREGON 97310 within 30 days from the date of well completion.

RECEIVED APR 6 - 1972 STATE ENGINEER SALEM. OREGON

NC

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

UMAT 3923

State Well No. 5N/35-2ca

State Permit No. U-462

(1) OWNER:
Name City of Milton FREEWATER
Address PO. Box 108 Milton Frwtr. ORE 97862

(2) TYPE OF WORK (check):
New Well ☐ Deepening ☐ Reconditioning ☒ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☐ Driven ☐
Cable ☒ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

(5) CASING INSTALLED: Threaded ☐ Welded ☒
12 " Diam. from +1 ft. to 232 ft. Gage .280
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

(6) PERFORATIONS: Perforated? ☐ Yes ☒ No.
Type of perforator used
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS: Well screen installed? ☐ Yes ☒ No
Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(8) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? ☒ Yes ☐ No If yes, by whom?
Yield: 1500 gal./min. with 145 ft. drawdown after 10 hrs.
" " " "
" " " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water 60 Depth artesian flow encountered ft.

(9) CONSTRUCTION:
Well seal—Material used 12" CASING, CEMENT
Well sealed from land surface to 232' ft.
Diameter of well bore to bottom of seal 12 in.
Diameter of well bore below seal 12 in.
Number of sacks of cement used in well seal 250 sacks
Number of sacks of bentonite used in well seal sacks
Brand name of bentonite
Number of pounds of bentonite per 100 gallons of water lbs./100 gals.
Was a drive shoe used? ☒ Yes ☐ No Plugs Size: location ft.
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? ☐ Yes ☒ No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:
County Umatilla Driller's well number
NE ¼ SW ¼ Section 2 T. 5N R. 35 E W.M.
Bearing and distance from section or subdivision corner
~~[illegible]~~
S86°44'W 527' From Ctr. Sec.

(11) WATER LEVEL: Completed well.
Depth at which water was first found ft.
Static level 187 ft. below land surface. Date 2-29-72
Artesian pressure lbs. per square inch. Date

(12) WELL LOG: Diameter of well below casing 12
Depth drilled 915 ft. Depth of completed well 915 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. *Report each change in position of Static Water Level and indicate principal water-bearing strata.*

MATERIAL	From	To	SWL
SEE PREVIOUS LOG			

Work started 12-6 1971 Completed 2-29 1972
Date well drilling machine moved off of well 2-25 1972

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] [signature] (Drilling Machine Operator) Date 3-30 1972
Drilling Machine Operator's License No. 361

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name CHARLES JUNGMANN DRILLING CO (Person, firm or corporation) (Type or print)
Address 115 REES AVE. W. W. WASH.
[Signed] [signature] (Water Well Contractor)
Contractor's License No. 236 Date 3-30, 1972

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

City Well No. 8

UMAT 4010

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the
STATE ENGINEER, SALEM, OREGON 97310
within 30 days from the date of well completion.

RECEIVED
JUN 4 1965
STATE ENGINEER
SALEM OREGON

WATER WELL REPORT
STATE OF OREGON
(Please type or print)

App #G-2502

State Well No. 5N/36-18 M

State Permit No. G-2312

(1) OWNER:

Name CITY OF MILTON FREEWATER

Address MILTON FREEWATER, ORE.

(2) LOCATION OF WELL:

County UMATILLA Driller's well number 4189

SW ¼ SW ¼ Section 18 T. 5N R. 36E W.M.

Bearing and distance from section or subdivision corner

(3) TYPE OF WORK (check):

New Well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐

If abandonment, describe material and procedure in Item 12.

(4) PROPOSED USE (check):

Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

(5) TYPE OF WELL:

Rotary ☐ Driven ☐
Cable ☒ Jetted ☐
Dug ☐ Bored ☐

(6) CASING INSTALLED: Threaded ☐ Welded ☐

24" Diam. from 0 ft. to 315 ft. Gage .375
20" Diam. from 0 ft. to 76.5 ft. Gage .375
16" Diam. from 0 ft. to 480 ft. Gage .312

(7) PERFORATIONS: Perforated? ☐ Yes ☒ No

Type of perforator used

Size of perforations in. by in.

perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(8) SCREENS: Well screen installed? ☐ Yes ☒ No

Manufacturer's Name

Type Model No.

Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(9) CONSTRUCTION:

Well seal—Material used in seal CEMENT GROUT

Depth of seal 0-78 ft. Was a packer used? NO

Diameter of well bore to bottom of seal 24 in.

Were any loose strata cemented off? ☐ Yes ☒ No Depth

Was a drive shoe used? ☒ Yes ☐ No

Was well gravel packed? ☐ Yes ☒ No Size of gravel:

Gravel placed from ft. to ft.

Did any strata contain unusable water? ☒ Yes ☐ No

Type of water? SURFACE depth of strata 31 FEET

Method of sealing strata off CASING AND GROUT

(10) WATER LEVELS:

Static level 239 ft. below land surface Date NOV 1, 1963

Artesian pressure lbs. per square inch Date

(11) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☐ No If yes, by whom? RJ STRASSER DRILLING Co

Yield: 1000 gal./min. with 67 ft. drawdown after 12 hrs.
" " " "
" " " "

Bailer test gal./min. with ft. drawdown after hrs.

Artesian flow g.p.m. Date

Temperature of water 60° Was a chemical analysis made? ☐ Yes ☒ No

(12) WELL LOG: Diameter of well below casing 12" AND 10"

Depth drilled 888 ft. Depth of completed well 888 ft.

Formation: *Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.*

MATERIAL	FROM	TO
SEE ATTACHED SHEET		

Work started FEB 21 1963 Completed APR 14 1965

Date well drilling machine moved off of well APR 15 1965

(13) PUMP:

Manufacturer's Name

Type: DEEP WELL TURBINE H.P.

Water Well Contractor's Certification:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME RJ STRASSER DRILLING Co
(Person, firm or corporation) (Type or print)

Address 8110 SE SUNSET LANE PORTLAND, ORE

Drilling Machine Operator's License No. 54

[Signed] Robert L. Strasser
(Water Well Contractor)

Contractor's License No. 10 Date JUNE 2, 1965

(USE ADDITIONAL SHEETS IF NECESSARY)

STATE ENGINEER
Salem, Oregon

State Well No. 5N/36-18M
County Umatilla
Application No. G-2502

Well Log

Owner: City of Milton-Freewater Owner's No. #8

Driller: R. J. Strasser, Portland, Oregon Date Drilled April 14, 1965

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Fill	0	9	9
Gravel and boulders	9	31	22
Weathered rock	31	38	7
Medium hard black rock	38	47	9
Broken rock	47	50	3
Hard black basalt	50	81	31
Medium hard basalt	81	83	2
Hard black basalt	83	96	13
Broken black rock	96	105	9
Hard black basalt	105	112	7
Broken gray basalt	112	121	9
Porous black rock	121	144	23
Porous dark brown rock	144	163	19
Broken black rock	163	180	17
Medium hard gray basalt	180	201	21
Black and reddish brown rock	201	209	8
Porous black basalt	209	316	7
Hard gray basalt	316	341	25
Medium hard dark gray basalt	341	352	11
Hard gray basalt	352	358	6
Porous black basalt	358	386	28
Medium hard gray basalt	386	398	12
Medium soft black basalt	398	437	39
Medium hard gray basalt	437	447	10

STATE ENGINEER
Salem, Oregon

State Well No. 5N/36-18M
County Umatilla
Application No. G-2502

Well Log

Owner: City of Milton-Freewater Owner's No. #8

Driller: R. J. Strasser, Portland, Oregon Date Drilled April 14, 1965

CHARACTER OF MATERIAL	(Feet below land surface) From	To	Thickness (feet)
Black basalt with layers of black clay	447	463	26
Medium hard gray basalt	463	566	103
Porous black basalt with black clay	566	613	47
Medium hard gray basalt	613	679	59
Medium hard black basalt	679	723	44
Medium hard gray basalt	723	779	56
Hard gray basalt	779	787	8
Medium hard gray basalt with black clay	787	811	24
Medium hard black basalt	811	825	14
Medium hard gray basalt	825	827	2
Hard gray basalt	827	830	3
Medium hard gray basalt	830	836	6
Black and red basalt	836	841	5
Broken porous black and brown basalt	841	864	23
Porous black basalt	864	869	5
Porous black and brown basalt	869	883	14
Medium soft black basalt	883	888	5

STATE ENGINEER
Salem, Oregon

State Well No. 5N/36-18M(1)

County UMATILLA

Application No.

Water Level Record

OWNER: MILTON-FREEWATER OWNER'S NO. #8

Description of measuring point:

Date	Water Level Feet ~~(above)~~ (below) Land Surface	Remarks	Date	Water Level Feet (above) (below) Land Surface	Remarks
3-19-64	239				
4-13	141.5				
6-15	193.5				
7-13	243				
8-24	245				
9-22	245.10				
10-26	245.40				
11-23	245				
12-21	245.50				

REMARKS:

WELL INFORMATION - WELL LOG

SUPPLY NAME: MILTON-FREEWATER
ID NUMBER : 4100522

NOTICE TO WATER WELL CONTRACTOR: The original and first copy of this report are to be filed with the STATE ENGINEER, SALEM, OREGON within 30 days from the date of well completion.

RECEIVED MAR 18 1970 STATE ENGINEER SALEM, OREGON

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

5N/36-18cb

State Well No. G-2502

State Permit No. G-2312

(1) OWNER:
Name CITY OF MILTON-FREEWATER ORE.
Address MILTON-FREEWATER ORE.

(2) TYPE OF WORK (check):
New Well ☐ Deepening ☒ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☐ Driven ☐
Cable ☒ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

(5) CASING INSTALLED: Threaded ☐ Welded ☐
SEE PREVIOUS LOG
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

(6) PERFORATIONS: Perforated? ☐ Yes ☐ No.
Type of perforator used
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS: Well screen installed? ☐ Yes ☐ No
Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(8) WATER LEVEL: Completed well.
Static level 269 ft. below land surface Date 9/21/70
Artesian pressure lbs. per square inch Date

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? ☒ Yes ☐ No If yes, by whom? CONTRACTOR
Yield: 1500 gal./min. with 107 ft. drawdown after 26 hrs.
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water 68 Was a chemical analysis made? ☐ Yes ☒ No

(10) CONSTRUCTION: SEE PREVIOUS LOG
Well seal—Material used
Depth of seal ft.
Diameter of well bore to bottom of seal in.
Were any loose strata cemented off? ☐ Yes ☐ No Depth
Was a drive shoe used? ☐ Yes ☐ No
Did any strata contain unusable water? ☐ Yes ☐ No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? ☐ Yes ☐ No Size of gravel:
Gravel placed from ft. to ft.

(11) LOCATION OF WELL:
County UMATILA Driller's well number 8
NW ¼ SW ¼ Section 18 T. 5N R. 36 E W.M.
Bearing and distance from section or subdivision corner

(12) WELL LOG: Diameter of well below casing 12X10
Depth drilled 1051 ft. Depth of completed well 1051 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level as drilling proceeds. Note drilling rates.

MATERIAL	From	To	SWL
SEE PREVIOUS LOG	0	888	269
BLACK BASALT	888	962	269
BROWN-BLACK BASALT	962	965	269
BLACK BASALT	965	973	269
GREY BASALT	973	1021	269
RED BASALT	1021	1025	269
RED-BLACK BASALT	1025	1030	269
BLACK-BASALT	1030	1050	269
GREY-BASALT	1050	1051	269

Work started 12-1 1969 Completed 3-3 1970
Date well drilling machine moved off of well 3-3 1970

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] Charles [signature] (Drilling Machine Operator) Date 3-10 1970
Drilling Machine Operator's License No. 361

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
NAME CHARLES SUCHMANN DRILLING CO. (Person, firm or corporation) (Type or print)
Address 415 REES AVE. W.W. WASH
[Signed] Charles [signature] (Water Well Contractor)
Contractor's License No. 236 Date 3-10 1970

(USE ADDITIONAL SHEETS IF NECESSARY)

Attatchment

City Well No. 9
5N/35 - 12 Q(1)

UMAT 3965

RECEIVED
AUG 2 4 1951
STATE ENGINEER
SALEM. OREGON

Application No. U-403
Permit No. U-373
Well No. 1, Umatilla Canning Co.
UMATILLA CO

REPORT ON COMPLETION OF WELL

(Note: This report should be submitted to the State Engineer, Salem, Oregon, as soon as possible after the well is completed. If more than one well is covered by this permit, a separate report shall be filed for each)

Date of Report August 22, 1951

1. Location of well: SW ¼ of SE ¼ of Section 12 Twp. 5N Rge. 35 E. W. M.
2. Name of nearest natural surface stream Walla Walla River
3. Distance from well to that stream: Approx. 4000 feet.
4. If the well is less than 1300 feet from a natural surface stream, give the difference in elevation between the ground surface at the well and the lowest point in stream channel: ...... feet.
5. Date of beginning drilling or digging. January 11, 1951
6. Date well was completed ,June 22, 1951

7. LOG OF MATERIALS ENCOUNTERED

Character of Material	Depth at which encountered		Thickness of stratum	
Yellow cement gravel	At surface 0	ft.	41	ft.
Broken Basalt & Blue Clay	41	ft.	285	ft.
Medium gray basalt & alternate clay & mud	285	ft.	421	ft.
Broken gray basalt	421	ft.	562	ft.
Black basalt & gray basalt	562	ft.	751	ft.
Medium black basalt -(2ft. Hard black basalt 816-818 ft)	751	ft.	878	ft.
Gray hard basalt	878	ft.	881	ft.
Medium black basalt	881	ft.	894	ft.
Hard black basalt	894	ft.	913	ft.
Remarks: Medium black basalt	913	ft.	918	ft.

WELL INFORMATION

8. Diameter of well see below inches. Depth of well 918 feet.
9. Depth at which water was first encountered 90 feet.
10. Water level when completed: 205 feet below ground surface.
11. Additional information regarding well; such as soil conditions, quick sand, caves, obstructions, rock, etc.: Some caving - 321 ft to 500 ft.

8. 24" from 0 to 104 ft.
20" from 104 to 321 ft.
16" from 321 to 690 ft.
12" from 690 to 918 ft.

5N/35-12(A)
UMATILLA Co

RECEIVED
AUG 24 1951
STATE ENGINEER
SALEM, OREGON

PUMP INFORMATION

12. Manufacturer of pump: A. D. Cook, Inc.
13. Address: Lawrenceburg, Indiana
14. Data on name or base plate: Serial No. 13254
Cook Rotation Pump
15. Data on pump bowl assembly: TR 5107 12 ~~TR~~ 527
26 12 TR 5280
16. Size of pump: 8" Turbine
17. Rated capacity: 950 gallons per minute.
18. Rated speed: 1765 revolutions per minute.
19. Number of stages: 8
20. Size of intake pipe: 8"
21. Size of discharge pipe: 8"
22. Length of intake pipe: 290 feet column, 25 feet bowl assembly, suction and strainer
23. Length of discharge pipe: 161.65 ft.
24. Suction lift: (difference in elevation between water surface in well and pump) 205 feet
25. Discharge lift: (difference in elevation between pump and end of discharge line) Hardly any -- pipe runs slightly downhill
26. Depth of pump intake below ground surface: 310 feet.
27. Remarks: This pump will be exchanged or worked over to that we can pump between 1400 and 1500 g.p.m. next season.

MOTOR OR ENGINE INFORMATION

28. Name of manufacturer: General Electric
29. Address: ~~XXXXX~~ Schenectady, N. Y.
30. Type of motor or engine: Electric Induction Motor
31. Data on name or base plate: Model 5K445A1A Service Factor 1.15 at Rated Volts
60 cycles 220/440 volts Type K Code F Frame 445 3 phase 60 cy
FL AMP 181/90.5 FL Speed 1765 No. WGJ6873648 TRYCLAD INDUCTION MOTOR
32. Rated horsepower: 75 H.P.
33. Rated speed of motor or engine: 1765 revolutions per minute.
34. Rated Capacity of Pump (with described motor)

950	g.p.m. at	205	ft. head
800	g.p.m. at	300	ft. head
700	g.p.m. at	350	ft. head
	g.p.m. at		ft. head
	g.p.m. at		ft. head

35. Remarks: We intend to trade this pump and motor or have it worked over next year (before June 1952) so that we can pump 1400-1500 g.p.m.

RECEIVED
AUG 24 1951
STATE ENGINEER
SALEM. OREGON

5N/35-12G(1)

CAPACITY TEST

36. Date of test: 8/16 & 8/17, 1951 37. Temperature of water 60 °F. or ___ °C.
38. Motor speed during test: From 1250 - 1800 R.P.M.
39. Test made by (weir, tank or other means): Weir

40.

DIRECT READING GUAGE	~~PRESSURE~~	TOTAL HEAD	*Total lift in feet	Gallons per min.	°Feet to water level	¤Draw-down	+Time	
205	___ lbs.,	Gauge at pump	Total 205 ft. ___ in.	Static water level	ft.	___ ft.	___ M.	8/16
215	___ lbs.,	Gauge at pump	Total 215 ft. ___ in.	336	215 ft.	10 ft.	7:15 AM.	
244	___ lbs.,	Gauge at pump	Total 244 ft. ___ in.	795	244 ft.	39 ft.	8:30 AM.	
266	___ lbs.,	Gauge at pump	Total 266 ft. ___ in.	1220	266 ft.	61 ft.	10:30 AM.	
287	___ lbs.,	Gauge at pump	Total 287 ft. ___ in.	1407	287 ft.	82 ft.	12:30 PM.	
287	___ lbs.,	Gauge at pump	Total 287 ft. ___ in.	1407	287 ft.	82 ft.	5:30 PM.	
270	___ lbs.,	Gauge at pump	Total 270 ft. ___ in.	1220	270 ft.	65 ft.	7:30 PM.	
285	___ lbs.,	Gauge at pump	Total 285 ft. ___ in.	1407	285 ft.	80 ft.	9:00 PM.	
285	___ lbs.,	Gauge at pump	Total 285 ft. ___ in.	1407	285 ft.	80 ft.	12:00 M.	Midnight
285	___ lbs.,	Gauge at pump	Total 285 ft. ___ in.	1407	285 ft.	80 ft.	4:00 AM.	8/17
270	___ lbs.,	Gauge at pump	Total 270 ft. ___ in.	1312	270 ft.	65 ft.	4:10 AM.	
263	___ lbs.,	Gauge at pump	Total 263 ft. ___ in.	1220	263 ft.	58 ft.	4:20 AM.	
264	___ lbs.,	Gauge at pump	Total 264 ft. ___ in.	1220	264 ft.	59 ft.	6:00 AM.	
295	___ lbs.,	Gauge at pump	Total 295 ft. ___ in.	1501	295 ft.	90 ft.	6:10 AM.	
295	___ lbs.,	Gauge at pump	Total 295 ft. ___ in.	1501	295 ft.	90 ft.	6:18 AM.	
209	___ lbs.,	Gauge at pump	Total ___ ft. ___ in.	(RECOVERY)	ft.	ft.	6:23 AM.	
	___ lbs.,	Gauge at pump	Total ___ ft. ___ in.		ft.	ft.	___ M.	

* Difference in elevation between water level in well and outlet of pump test line.
° Distance from ground level to water surface in well.
¤ Distance water level is lowered during time interval.
\+ Hour and minute at which observation was made.

41. Installation will work efficiently under normal head of 325 ft.
42. Water is discharged into: Main lines, Umatilla Canning Company Plant.

43. Was water lowered to pump intake by test? Yes - deliberately.
44. Remarks: Didn't have enough column on to go beyond 1501 G.P.M. on test. Had only 90 feet of column beyond static water level of 205 feet.
Well recovered to static water level from 6:18 a.m. to 6:23 a.m. 8/17/51.
Recovery rate of 5 minutes.

GENERAL INFORMATION

45. Name of contractor or other party who drilled or dug well: A. A. Durand & Son
Address: 115 Rees Avenue, Walla Walla, Washington
46. Pump and motor were installed by: Pump, Pipe, & Power Co., Portland, Oregon
Address: ___
47. Capacity test was made by: A. A. Durand & Son, Walla Walla, Washington
Address: ___
48. General remarks: ___

May 8, 1989

James A. Swayne
City Manager
Milton-Freewater City Hall
Milton-Freewater, OR 97862

Attn: Jack King, Director - Public Works

Re: Pump Test - Umatilla (Hendricks) Well
May 3, 1989 (0900 - 1700 hours)

Dear Mr. Swayne;

The purpose of this report and of this pump test is to establish the present conditions of the Umatilla (Hendricks) water well. Knowing these conditions, make a recommendation to the City of Milton-Freewater with regard to acquiring the water well.

<u>History</u> - The water well was drilled in 1951, and was used from that date until November 1978. The well is 913 feet deep, and has casing installed and hole sizes drilled as follows:

0 to 104 feet	24 inch diameter hole
104 to 321 feet	20 inch diameter hole
0 to 193 feet	18 inch diameter casing
193 to 296 feet	16 inch diameter casing (15.25" ID - 16" O.D.)
296 to 321 feet	concrete wall, 16" nominal
321 to 695 feet	16" nominal rock wall hole
695 to 724 feet	cemented to stabilize hole
695 to 913 feet	12" nominal rock wall hole

A log of the materials penetrated is provided. The original static water level (SWL) was 202 ft. depth - 1951, measured from the collar. The original reported yield was 920 gpm with a drawdown of 46 feet. This is a specific capacity of 20 gallons per minutes per foot of drawdown.

The water well is located in the SW 1/4 SE 1/4 Section 12T5N R35E Wm. The ground elevation, taken from the Milton-Freewater City one foot contour map is 1152 feet. Two feet were added for the concrete slab and ring, so elevation 1154 was used for the collars.

No aquifers or changes is the SWL were recorded on the daily drilling log.

The presently installed pump was used for the pumping test. The pump in a General Electric turbine pump with a 125 horse power electric motor. Furnished data says original installation was 33 pieces of 10 feet length; 8 inch diameter pipe, plus 2 - 5 feet length; plus 74 inches of bowl section. Original length was 340 feet plus 6 feet of bowls. In 1968, 20 feet of column was added at the top for 360 feet plus bowls. The air line was also set to the 360 feet depth. A note also says that the pump was last pulled in 1972.

Considerable effort was expended to rotate the driveshaft after non-use since 1979. The equipment was operational on May 3, 1989. The City crew had installed a discharge line for the pumped water into the commercial sewage line. In the discharge line was installed a meter reading in gallons times 1000 and a discharge control valve. The air line was equipped with pressure gauge (PSI) having two pound increments and pressure gauge direct reading in feet with one foot increments. The pressure gauge prior to pumping read 19.5 psi which is 45 feet of head. The direct reading gauge was 44 feet of head.

The pump test started at 0847 hours and concluded 1700 hours on May 3, 1989. See test data on Table 1.

Conclusion - The yield to drawdown characteristics, are of the same magnitude as the original data. See pump curve.

The acquisition of this well is recommended. If the intent is to pump this well at greater than 800 gpm, then a pump test covering the range of use, 800 to 1200 gpm, should be conducted to establish drawdown to yield rates for pump design.

Respectfully,

Dick Gullixson

CERTIFIED
OREGON
Richard L. Gullixson
No. E 107
ENGINEERING GEOLOGIST

cc: Jack D. King
Howard Moss
John Hendricks
Dick Gullixson

APPENDIX E

Water Right Data

Water Rights Information Query Results

	Contacts	Application	Permit	Certificate	Claim	Decree	Transfers	Status	
Select	▷ OWNER: CITY OF MILTON FREEWATER PO BOX 106 MILTON FREEWATER, OR 97862	G5389	G4924					NC	WELL NO. 1
Select	▷ OWNER: CITY OF MILTON FREEWATER PO BOX 6 MILTON FREEWATER, OR 97862	G13494	G12582					NC	WELL NO. 9
Select	▷ OWNER: CITY OF MILTON FREEWATER DAVID BRADSHAW 722 S MAIN MILTON FREEWATER, OR 97862	G14665	G13488					NC	
Select	▷ OWNER: CITY OF MILTON FREEWATER PO BOX 6 MILTON FREEWATER, OR 97862	R69553	R11219					NC	
Select	▷ OWNER: CITY OF MILTON FREEWATER 722 S MAIN ST MILTON FREEWATER, OR 97862	S69266	S50962					NC	
Select	▷ OWNER: CITY OF MILTON FREEWATER MILTON FREEWATER, OR 97862	U511	U462	23519				NC	WELL NO. 6
Select	▷ OWNER: CITY OF MILTON FREEWATER MILTON FREEWATER, OR 97862	U808	U717	23532				NC	WELL NO. 4
Select	▷ OWNER: CITY OF MILTON FREEWATER MILTON FREEWATER, OR 97862	U809	U718	23533				NC	WELL NO. 5
Select	▷ OWNER: CITY OF MILTON FREEWATER BOX 108 MILTON FREEWATER, OR 97862	G2502	G2312	41011				NC	WELL NO. 8
Select	▷ OWNER: CITY OF MILTON FREEWATER 722 S MAIN MILTON FREEWATER, OR 97862	G4667	G4391	41022				NC	

1 2

Help understanding and working with the Water Rights Information System

Download: Point of diversion data, Place of use data, Stakeholder data

Return to WRIS Query

Water Rights Information Query Results

	Contacts	Application	Permit	Certificate	Claim	Decree	Transfers	Status
Select	APPLICANT: CITY OF MILTON FREEWATER PO BOX 6 MILTON FREEWATER, OR 97862					WALLA WALLA RIVER	T8626 (Confirming)	NC
Select	APPLICANT: CITY OF MILTON FREEWATER PO BOX 6 MILTON FREEWATER, OR 97862					WALLA WALLA RIVER	T8626 (Confirming)	NC
Select	APPLICANT: CITY OF MILTON FREEWATER PO BOX 6 MILTON FREEWATER, OR 97862					WALLA WALLA RIVER	T8626 (Confirming)	NC
Select	OWNER: CITY OF MILTON FREEWATER 722 S MAIN PO BOX 6 MILTON FREEWATER, OR 97862	S55136	S41598	82171				NC

1 2

Help understanding and working with the Water Rights Information System

Download: Point of diversion data, Place of use data, Stakeholder data

Return to WRIS Query

WELL NO. 1

Water Right Information Query Results

Contact Information

▼ Current contact information

OWNER:
CITY OF MILTON FREEWATER
PO BOX 106
MILTON FREEWATER, OR 97862

Water Right Information

Status: Non-Cancelled

County: Umatilla

File Folder Location: Salem

Watermaster District: 5

Documents

▶ Application: G 5389 digital map

▶ Permit: G 4924 document, digital map, paper map

▶ Order(s)

▷ View right with New Web Mapping (beta)

Point(s) of Diversion

▶ POD 1 - CITY OF M.F. WELL 1 > WALLA WALLA RIVER

Place(s) of Use

▶ Use - MUNICIPAL USES (Primary); Priority Date: 1/4/1971

Water Right Genealogy

No genealogy records available for this water right, try the family link below instead.

View Water Rights in same Family

Help understanding and working with the Water Rights Information System

Report Errors with Water Right Data

Return to WRIS Query

WELL NO. 1

RECEIVED
JAN 4 1970
STATE ENGINEER
SALEM, OREGON

Permit No. G-4924

APPLICATION FOR A PERMIT

To Appropriate the Ground Waters of the State of Oregon

I, City of Milton-Freewater (Name of applicant)

of P. O. Box 108, Milton-Freewater, Oregon (Postoffice Address), *county of* Umatilla,

state of Oregon, *do hereby make application for a permit to appropriate the following described ground waters of the state of Oregon, SUBJECT TO EXISTING RIGHTS:*

If the applicant is a corporation, give date and place of incorporation

1. *Give name of nearest stream to which the well, tunnel or other source of water development is situated* Walla Walla River (Name of stream) *tributary of* Columbia River

2. *The amount of water which the applicant intends to apply to beneficial use is* 2.0 *cubic feet per second or* 900 *gallons per minute.*

3. *The use to which the water is to be applied is* domestic, industrial, commercial and municipal use.

4. *The well or other source is located* 850 *ft.* N (N. or S.) *and* 250 *ft.* W (E. or W.) *from the* S.E. *corner of* S. E. ¼ of the N. W. ¼ of Section 12 T. 5 N. R. 35 E.W.M. (Section or subdivision)

The S. E. corner of the S. E. ¼ of the N. W. ¼ of Section 12 T. 5N R. 35 E. W. M. is also the center of said Sec. 12 (If preferable, give distance and bearing to section corner) (If there is more than one well, each must be described. Use separate sheet if necessary)

being within the S. E. ¼ N. W. ¼ *of Sec.* 12, *Twp.* 5 N, *R.* 35 E., *W. M., in the county of* Umatilla

5. *The* (We intend to use existing pipeline to ~~xxxx~~ existing well) (Canal or pipe line) *miles in length, terminating in the* S.E. ¼ N.W. ¼ (Smallest legal subdivision) *of Sec.* 12, *Twp.* 5 N, *R.* 35 E., *W. M., the proposed location being shown throughout on the accompanying map.*

6. *The name of the well or other works is* City of Milton-Freewater Well No. 1
old permit No. U-102

DESCRIPTION OF WORKS

7. *If the flow to be utilized is artesian, the works to be used for the control and conservation of the supply when not in use must be described.*

8. *The development will consist of* redeveloping one (1) well (Give number of wells, tunnels, etc.) *having a diameter of* 12 *inches and an estimated depth of* 800 *feet. It is estimated that* 0 feet *feet of the well will require* (Kind) *casing. Depth to water table is estimated* 112 (Feet)

100' of 12" steel casing in already installed in well, perforations are recorded in the casing at 50'. Perforations will be sealed by pressure grouting.

CANAL SYSTEM OR PIPE LINE— **G 4924**

9. (a) Give dimensions at each point of canal where materially changed in size, stating miles from headgate. At headgate: width on top (at water line) .... feet; width on bottom .... feet; depth of water .... feet; grade .... feet fall per one thousand feet.

(b) At .... miles from headgate: width on top (at water line) .... feet; width on bottom .... feet; depth of water .... feet; grade .... feet fall per one thousand feet.

(c) Length of pipe, ... ft.; size at intake .... in.; in size at .... ft. from intake .... in.; size at place of use .... in.; difference in elevation between intake and place of use, ... ft. Is grade uniform? .... Estimated capacity, ... sec. ft.

10. If pumps are to be used, give size and type 1500 G. P. M. turbine

Give horsepower and type of motor or engine to be used 200 H. P. electric

11. If the location of the well, tunnel, or other development work is less than one-fourth mile from a natural stream or stream channel, give the distance to the nearest point on each of such channels and the difference in elevation between the stream bed and the ground surface at the source of development

Walla Walla River is 1000' to East. River channel is approximately 9' lower than well site.

12. Location of area to be irrigated, or place of use ....

Township N. or S.	Range E. or W. of Willamette Meridian	Section	Forty-acre Tract	Number Acres To Be Irrigated
5 North	Range 35 E.	Sec. 12		Municipal
5 North	Range 35 E	Sec. 1		Municipal
5 North	Range 35 E	Sec. 11		Municipal
5 North	Range 35 E.	Sec. 2		Municipal
5 North	Range 35 E	Sec. 13		Municipal
5 North	Range 36 E	Sec. 18		Municipal
6 North	Range 35 E	Sec. 35		Municipal

(If more space required, attach separate sheet)

Character of soil .... Gravel

Kind of crops raised ....

MUNICIPAL SUPPLY— **G 4924**

13. *To supply the city of* Milton-Freewater

in Umatilla *county, having a present population of* 4,510

and an estimated population of 5,000 5,000 *in 19* 80 80.

ANSWER QUESTIONS 14, 15, 16, 17 AND 18 IN ALL CASES

14. *Estimated cost of proposed works, $* 20,000

15. *Construction work will begin on or before* January 15 1971

16. *Construction work will be completed on or before* May 15, 1971

17. *The water will be completely applied to the proposed use on or before* October 1, 1971

18. *If the ground water supply is supplemental to an existing water supply, identify any application for permit, permit, certificate or adjudicated right to appropriate water, made or held by the applicant.* Permit No. U-102 allows a water right for 1.5 C.F.S. on Well No. 1 dated January 18, 1937

(Signature of applicant)

Remarks: It is the intent of this Application for water right to allow the City of Milton-Freewater to rework existing Well No. 1, Permit No. U-102 and develop additional water up to a capacity of 3.5 c.f.s. or 1573 G.P.M. The City Of Milton-Freewater does not wish to change the priority date of the existing Permit No. U-102, for 1.5 c.f.s., dated Jan. 18, 1937.

Work to be done on the well includes sealing recorded perforations at 50', checking seal into basalt and deepening well in an attempt to improve the capacity of the well. Also when a pump is installed after reworking the discharge flange will be installed above ground and well casing will be extended above ground level to meet State of Oregon requirements.

STATE OF OREGON,
County of Marion, } ss.

This is to certify that I have examined the foregoing application, together with the accompanying maps and data, and return the same for ....

In order to retain its priority, this application must be returned to the State Engineer, with corrections on or before ...., 19.....

WITNESS my hand this ...... *day of* ...., 19.....

....
STATE ENGINEER

By ....
ASSISTANT

STATE OF OREGON, }
County of Marion, } ss.

PERMIT

This is to certify that I have examined the foregoing application and do hereby grant the same, SUBJECT TO EXISTING RIGHTS and the following limitations and conditions:

The right herein granted is limited to the amount of water which can be applied to beneficial use and shall not exceed 2.0 *cubic feet per second measured at the point of diversion from the well or source of appropriation, or its equivalent in case of rotation with other water users, from* Well No. 1

The use to which this water is to be applied is municipal

If for irrigation, this appropriation shall be limited to .... of one cubic foot per second or its equivalent for each acre irrigated and shall be further limited to a diversion of not to exceed .... acre feet per acre for each acre irrigated during the irrigation season of each year;

and shall be subject to such reasonable rotation system as may be ordered by the proper state officer.

The well shall be cased as necessary in accordance with good practice and if the flow is artesian the works shall include proper capping and control valve to prevent the waste of ground water.

The works constructed shall include an air line and pressure gauge or an access port for measuring line, adequate to determine water level elevation in the well at all times.

The permittee shall install and maintain a weir, meter, or other suitable measuring device, and shall keep a complete record of the amount of ground water withdrawn.

The priority date of this permit is January 4, 1971

Actual construction work shall begin on or before November 23, 1972 *and shall thereafter be prosecuted with reasonable diligence and be completed on or before October 1, 19*73
Extended to Oct. 1, 1984 — Extended to Oct. 1979

*Complete application of the water to the proposed use shall be made on or before October 1, 19*74
Extended to Oct. 1, 1984 — Extended to Oct. 1979

WITNESS my hand this 23rd *day of* November, 1971

[signature]
STATE ENGINEER

BC- Extended to October 1, 1989; 10-1-91; 10-1-99

Application No. G-5389
Permit No. G-4924

PERMIT

TO APPROPRIATE THE GROUND WATERS OF THE STATE OF OREGON

This instrument was first received in the office of the State Engineer at Salem, Oregon, on the 4th *day of* January, *19*71, *at* 8:00 *o'clock* A *M.*

Returned to applicant:

Approved: November 23, 1971

Recorded in book No. ...... of Ground Water Permits on page G-4924

CHRIS L. WHEELER
STATE ENGINEER

Drainage Basin No. 2 *page* 68

$27.00

WELL NO. 9

Water Right Information Query Results

Contact Information

Current contact information

OWNER:
CITY OF MILTON FREEWATER
PO BOX 6
MILTON FREEWATER, OR 97862

Documents

- **Application: G 13494** digital map
- **Permit: G 12582** document, digital map, paper map
- View right with New Web Mapping (beta)

Water Right Information

Status: Non-Cancelled

County: Umatilla

File Folder Location: Salem

Watermaster District: 5

Point(s) of Diversion

POD 1 - A WELL > WALLA WALLA RIVER

Place(s) of Use

Use - MUNICIPAL USES (Primary); Priority Date: 8/16/1993

Water Right Genealogy

----No genealogy records available for this water right, try the family link below instead.

View Water Rights in same Family

Help understanding and working with the Water Rights Information System

Report Errors with Water Right Data

Return to WRIS Query

STATE OF OREGON

COUNTY OF UMATILLA

PERMIT TO APPROPRIATE THE PUBLIC WATERS

THIS PERMIT IS HEREBY ISSUED TO

CITY OF MILTON-FREEWATER (541) 938-5531
PO BOX 6
MILTON-FREEWATER, OREGON 97862

The specific limits for the use are listed below along with conditions of use.

APPLICATION FILE NUMBER: G-13494

SOURCE OF WATER: A WELL IN WALLA WALLA RIVER BASIN

PURPOSE OR USE: MUNICIPAL USE

RATE OF USE: 3.34 CUBIC FEET PER SECOND

PERIOD OF USE: YEAR ROUND

DATE OF PRIORITY: FEBRUARY 27, 1996

POINT OF DIVERSION LOCATION: SW 1/4 SE 1/4, SECTION 12, T5N, R35E, W.M.; 840 FEET NORTH AND 2020 FEET WEST FROM THE SE CORNER OF SECTION 12

THE PLACE OF USE IS LOCATED AS FOLLOWS:

SERVICE AREA OF THE CITY OF MILTON-FREEWATER

Measurement, recording and reporting conditions:

A. Before water use may begin under this permit, the permittee shall install a meter or other suitable measuring device as approved by the Director. The permittee shall maintain the meter or measuring device in good working order, shall keep a complete record of the amount of water used each month and shall submit a report which includes the recorded water use measurements to the Department annually or more frequently as may be required by the Director. Further, the Director may require the permittee to report general water use information, including the place and nature of use of water under the permit.

B. The permittee shall allow the watermaster access to the meter or measuring device; provided however, where the meter or measuring device is located within a private structure, the watermaster shall request access upon reasonable notice.

The water user shall develop a plan to monitor and report the impact of water use under this permit on water levels within the aquifer that provides water to the permitted well(s). The plan shall be submitted to the Department within one year of the date the permit is issued and shall be subject to the approval of the Department. At a minimum, the plan shall include a program to periodically measure static water levels within the permitted well(s) or an adequate substitute such as water levels in nearby wells. The plan shall also stipulate a reference water level against which any water-level declines will be compared. If a well listed on this permit (or replacement well) displays a total static water-level decline of 25 or more feet over any period of years, as compared to the reference level, then the water user shall discontinue use of, or reduce the rate or volume of withdrawal from, the well(s). Such action shall be taken until the water level recovers to above the 25-foot decline level or until the Department determines, based on the water user's and/or the Department's data and analysis, that no action is necessary because the aquifer in question can sustain the observed declines without adversely impacting the resource or senior water rights. The water user shall in no instance allow excessive decline, as defined in Commission rules, to occur within the aquifer as a result of use under this permit.

Within TWO YEARS of permit issuance, the permittee shall submit a water management and conservation plan consistent with Oregon Administrative Rules Chapter 690, Division 86.

If at any time the well or its use:

a) acts as a conduit for groundwater contamination,
b) allows loss of artisan pressure,
c) allows waste of groundwater,
d) interferes with senior groundwater users or
e) interferes with surface water sources,

the Department may require that the well be repaired in accordance with current well construction standards.

STANDARD CONDITIONS

The wells shall be constructed in accordance with the General Standards for the Construction and Maintenance of Water Wells in Oregon. The works shall be equipped with a usable access port, and may also include an air line and pressure gauge adequate to determine water level elevation in the well at all times.

The use shall conform to such reasonable rotation system as may be ordered by the proper state officer.

Prior to receiving a certificate of water right, the permit holder shall submit the results of a pump test meeting the department's standards, to the Water Resources Department. The Director may require water level or pump test results every ten years thereafter.

Failure to comply with any of the provisions of this permit may result in action including, but not limited to, restrictions on the use, civil penalties, or cancellation of the permit.

This permit is for the beneficial use of water without waste. The water user is advised that new regulations may require the use of best practical technologies or conservation practices to achieve this end.

By law, the land use associated with this water use must be in compliance with statewide land-use goals and any local acknowledged land-use plan.

The use of water shall be limited when it interferes with any prior surface or ground water rights.

The Director finds that the proposed use(s) of water described by this permit, as conditioned, will not impair or be detrimental to the public interest.

Actual construction of the well shall begin within one year from permit issuance and shall be completed on or before October 1, 1998. Complete application of the water to the use shall be made on or before October 1, 1999.

Issued July 8, 1996

for Martha O. Pagel, Director
Water Resources Department

WELL No.6

Water Right Information Query Results

Contact Information

▼ Current contact information

OWNER:
CITY OF MILTON FREEWATER
MILTON FREEWATER, OR 97862

Documents

View all scanned documents

- Application: U 511 digital map
- Permit: U 462 document, digital map
- Certificate: 23519 document, digital map, paper map
- View right with New Web Mapping (beta)

Water Right Information

Status: Non-Cancelled

County: Umatilla

File Folder Location: Salem

Watermaster District: 5

Point(s) of Diversion

- POD 1 - MILTON FREEWATER WE > WALLA WALLA RIVER

Place(s) of Use

Add TRS grouping

- Use - MUNICIPAL USES (Primary); Priority Date: 7/16/1952

Water Right Genealogy

---No genealogy records available for this water right, try the family link below instead.

View Water Rights in same Family

Help understanding and working with the Water Rights Information System

Report Errors with Water Right Data

Return to WRIS Query

WELL NO. 6 PAGE 1 OF 5

23519

Permit No. [illegible]

APPLICATION FOR A PERMIT

To Appropriate the Underground Waters of the State of Oregon

I, City of Milton-Freewater, Oregon (Name of applicant)

of Milton (Postoffice), county of Umatilla

state of Oregon, do hereby make application for a permit to appropriate the following described underground waters of the state of Oregon, SUBJECT TO EXISTING RIGHTS:

If the applicant is a corporation, give date and place of incorporation Charter Milton-Freewater January 1, 1951

1. Give name of nearest stream to which the well, tunnel, or other source of water development is situated Walla Walla River (Name of stream) tributary of Columbia River

2. The amount of water which the applicant intends to apply to beneficial use is 3.5 cubic feet per second.

3. The use to which the water is to be applied is City Water Supply (Domestic and Industrial)

4. The place where the water is to be pumped or developed is located 2" I.P. = S 86° 44' W - 527. feet from center Section 2 Twp 5 N. Range 35 EWM and Well is S. 22° 37' E. - 39 from Iron Pipe (Give distance and bearing from section corner)

being within the N.E. ¼ of S.W. ¼ of Sec. 2 Twp. 5 N R. 35 E. W. M., in the county of Umatilla.

5. The 8" Pipe Line (Canal or pipe line) to be 15 feet in length, terminating in the N.E. ¼ of S.W. ¼ (Smallest legal subdivision) of Sec. 2 Twp. 5 N R. 35 E, W. M., the proposed location being shown throughout on the accompanying map.

6. The name of the well or other works is Milton-Freewater Well No. 6

DESCRIPTION OF WORKS

7. If the flow to be utilized is artesian, the works to be used for the control and conservation of the supply when not in use must be described.

8. The development will consist of one (Give number of wells, tunnels, etc.) having a diameter of 12 inches and an estimated depth of 952 feet.

(... in size, stating miles from
... feet; width on bottom
... depth of water ... feet fall per one

... miles from headgate: width on top (at water line) ...
... feet; width on bottom ... feet; depth of water ... feet;
... feet fall per one thousand feet.

(b) Length of pipe, ... ft.; size at intake, ... in.; in size at ... ft.
from intake ... in.; size at place of use ... in.; difference in elevation between
intake and place of use, ... ft. Is grade uniform? ... Estimated capacity,
... sec. ft.

10. If pumps are to be used, give size and type Cook Deep Well Turbine Pump - 7 stages; 2" shaft; 150 feet of 10" Column J 1300 GPM 305 Ft.

Give capacity and type of motor or engine to be used 125 HP General Electric Motor - 220/440

11. If the location of the well, tunnel, or other development work is less than one-fourth mile from a natural stream or stream channel, give the distance to be the nearest point on each of such channels and the difference in elevation between the stream bed and the ground surface at the source of development

12. Location of area to be irrigated, or place of use in water system of former city of Freewater

Township	Range	Section	Forty-acre Tract	Number Acres To Be Irrigated
5 N	35 EWM	1	N.W. ¼ of N. W. ¼	
			S.W. ¼ of N.W. ¼	
			N½ of N. E. ¼ of S.W.¼	
		2	N.E. ¼ of N.W. ¼	
			S.E. ¼ of N.W.¼	
			N.E. ¼ of N.E. ¼	
			N.W. ¼ of N.E. ¼	
			S.W. ¼ of N.E. ¼	
			S.E. ¼ of N. E.¼	

(If more space required, attach separate sheet)

(a) Character of soil ...

(b) Kind of crops raised ...

MUNICIPAL SUPPLY—

13. (a) To supply the city of Milton-Freewater

Umatilla (Name of) county, having a present population of 3851

and an estimated population of ... in 19...

[illegible] L-[illegible]

[illegible] on or before Well Drilled in 1950

[illegible] will be completed on or before Pump installation - July, 1952

The water will be completely applied to the proposed use on or before [illegible] 1, 1952

C/1

City of Milton-Freewater
by: Robert L. [illegible]
Robert L. Brunton
City Manager

Remarks: This well was drilled by the former City of Freewater in 1950 and abandoned as being dry. The City of Milton-Freewater has been running test on this well for sometime and has found an adequate water supply. The water was tested by the State and found to conform to standards of purity for drinking water. However, the well is now in the process of being sealed off.

STATE OF OREGON, }
County of Marion, } *ss.*

This is to certify that I have examined the foregoing application, together with the accompanying maps and data, and return the same for ....

In order to retain its priority, this application must be returned to the State Engineer, with corrections on or before ...., 19....

WITNESS my hand this .... *day of* ...., 19....

STATE ENGINEER

...fy that I have examined the foregoing application and do hereby grant the same, ...EXISTING RIGHTS and the following limitations and conditions:

...The right herein granted is limited to the amount of water which can be applied to beneficial use and shall not exceed 3.50 cubic feet per second measured at the point of diversion from the well or source of appropriation, or its equivalent in case of rotation with other water users, from Milton-Freewater Well No. 6

The use to which this water is to be applied is municipal

If for irrigation, this appropriation shall be limited to .... of one cubic foot per second

and shall be subject to such reasonable rotation system as may be ordered by the proper state officer.

The well shall be so cased as to prevent the loss of underground water.

The priority date of this permit is July 16, 1952

Actual construction work shall begin on or before August 29, 1953 and shall thereafter be prosecuted with reasonable diligence and be completed on or before October 1, 1954

Complete application of the water to the proposed use shall be made on or before October 1, 1955

WITNESS my hand this 29th day of August, 1952

Chas E Stricklin
STATE ENGINEER

Application No. U-571

Permit No. U-462

PERMIT

TO APPROPRIATE THE UNDERGROUND WATERS OF THE STATE OF OREGON

This instrument was first received in the office of the State Engineer at Salem, Oregon, on the 16th day of July, 1952, at 1:00 o'clock P. M.

Returned to applicant:

Corrected application received:

Approved:

August 29, 1952

Recorded in book No. 2 of Permits on page 462

CHAS. E. STRICKLIN
STATE ENGINEER

Drainage Basin No 7 Page 1 C

Fees Paid $16.00

State Printing Dept.

WELL NO. 6 PAGE 5 OF 5

STATE OF OREGON

COUNTY OF UMATILLA

CERTIFICATE OF WATER RIGHT

This Is to Certify, That CITY OF MILTON-FREEWATER

of Milton-Freewater, State of Oregon, has made proof to the satisfaction of the STATE ENGINEER of Oregon, of a right to the use of the waters of Milton-Freewater Well No. 6 a tributary of Walla Walla River for the purpose of municipal under Permit No. U-462 of the State Engineer, and that said right to the use of said waters has been perfected in accordance with the laws of Oregon; that the priority of the right hereby confirmed dates from July 16, 1952;

that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed 3.50 cubic feet per second

or its equivalent in case of rotation, measured at the point of diversion from the stream. The point of diversion is located in the NE¼SW¼, Section 2, Township 5 North, Range 35 East, W.M.

The amount of water used for irrigation, together with the amount secured under any other right existing for the same lands, shall be limited to - - - - - - - - of one cubic foot per second per acre,

and shall conform to such reasonable rotation system as may be ordered by the proper state officer.

A description of the place of use under the right hereby confirmed, and to which such right is appurtenant, is as follows:

NW¼NW¼
SW¼NW¼
N½NE¼SW¼
Section 1
NE¼NW¼
SE¼NW¼
NE¼NE¼
NW¼NE¼
SW¼NE¼
SE¼NE¼
Section 2
Township 5 North, Range 35 East, W.M.

The right to the use of the water for the purposes aforesaid is restricted to the lands or place of use herein described.

WITNESS the signature of the State Engineer, affixed this 20th day of December, 1957

LEWIS A. STANLEY State Engineer

Recorded in State Record of Water Right Certificates, Volume 17, page 23519.

WELL NO. 4

Water Right Information Query Results

Contact Information

Current contact information

OWNER:
CITY OF MILTON FREEWATER
MILTON FREEWATER, OR 97862

Documents

View all scanned documents

Application: U 808 digital map

Permit: U 717 document, digital map

Certificate: 23532 document, digital map, paper map

View right with New Web Mapping (beta)

Water Right Information

Status: Non-Cancelled

County: Umatilla

File Folder Location: Salem

Watermaster District: 5

Point(s) of Diversion

POD 1 - WELL 4 > LITTLE WALLA WALLA RIVER

Place(s) of Use

Add IRS grouping

Use - MUNICIPAL USES (Primary); Priority Date: 4/13/1955

Water Right Genealogy

--No genealogy records available for this water right, try the family link below instead.

View Water Rights in same Family

Help understanding and working with the Water Rights Information System

Report Errors with Water Right Data

Return to WRIS Query

WELL NO. 4

Application No. 23532

RECEIVED
APR 8 1955
STATE ENGINEER
SALEM, OREGON

Permit No. U-917

APPLICATION FOR A PERMIT

To Appropriate the Underground Waters of the State of Oregon

I, Milton-Freewater (Name of applicant)

of Milton-Freewater (Postoffice), *county of* Umatilla,

state of Oregon, *do hereby make application for a permit to appropriate the following described underground waters of the state of Oregon, SUBJECT TO EXISTING RIGHTS:*

If the applicant is a corporation, give date and place of incorporation

Milton-Freewater, Oregon Jan. 1, 1951

1. Give name of nearest stream to which the well, tunnel or other source of water development is situated Little Walla Walla River (Name of stream)

tributary of Columbia River

2. The amount of water which the applicant intends to apply to beneficial use is 10 *cubic feet per second.*

3. The use to which the water is to be applied is Domestic and Commercial

4. The place where the water is to be pumped or developed is located Lot 16 Blk. 55

Original town of Freewater, Oregon - N. 58° - 52' W. - 917.5 Ft. from (Give distance and bearing from section corner)

¼ corner between sections 1 & 2 Township 5 N.R. 35 EWM

S.W.¼ of S.E.¼ of N.E.¼ of Sec. 2 Township 5 N.R. 35 EWM Alt. 996 above sea level

being within the ______ *of Sec.* ______ *Twp.* ______ *R.* ______

W. M., in the county of Umatilla

5. The ______ (Canal or pipe line) *to be* ______ *miles*

in length, terminating in the ______ (Smallest legal subdivision) *of Sec.* ______ *, Twp.* ______

R. ______ *, W. M., the proposed location being shown throughout on the accompanying map.*

6. The name of the well or other works is Well No. 4

DESCRIPTION OF WORKS

7. If the flow to be utilized is artesian, the works to be used for the control and conservation of the supply when not in use must be described.

8. The development will consist of One well (Give number of wells, tunnels, etc.) *having a diameter of* 5" I.D. pipe *inches and an estimated depth of* 374 *feet.*

Pumping directly in the water system.

U-717

CANAL SYSTEM OR PIPE LINE—

9. (a) *Give dimensions at each point of canal where materially changed in size, stating miles from headgate. At headgate: width on top (at water line) .... feet; width on bottom .... feet; depth of water .... feet; grade .... feet fall per one thousand feet.*

(b) *At .... miles from headgate: width on top (at water line) .... feet; width on bottom .... feet; depth of water .... feet; grade .... feet fall per one thousand feet.*

(c) *Length of pipe, ... ft.; size at intake, ... in.; in size at .... ft. from intake .... in.; size at place of use .... in.; difference in elevation between intake and place of use, ... ft. Is grade uniform? .... Estimated capacity, ... sec. ft.*

10. *If pumps are to be used, give size and type* Pearless Turbine - Rated 440 G.P.M

Give capacity and type of motor or engine to be used U.S. Motor 50 H.P.

11. *If the location of the well, ~~tunnel~~, or other development work is less than one-fourth mile from a natural stream or stream channel, give the distance to be the nearest point on each of such channels and the difference in elevation between the stream bed and the ground surface at the source of development*

880 ft. to Little Walla Walla River (difference in elevation 8 ft.)

12. *Location of area to be irrigated, or place of use* in water system of former City of Freewater

Township	Range	Section	Forty-acre Tract	Number Acres To Be Irrigated
WILLAMETTE MERIDIAN				
5 N	35 EWM	1	N.W. ¼ of N.W. ¼	
			S.W. ¼ of N. W. ¼	
			N½ of N.E. ¼ of S.W. ¼	
		2	N.E. ¼ of N. W. ¼	
			S. E. ¼ of N. W. ¼	
			N. E. ¼ of N. E. ¼	
			N.W. ¼ of N. E. ¼	
			S. W. ¼ of N.E. ¼	
			S. E. ¼ of N. E. ¼	

(If more space required, attach separate sheet)

(a) *Character of soil* ....

(b) *Kind of crops raised* ....

MUNICIPAL SUPPLY—

13. (a) *To supply* ~~the city of~~ portion of City of Milton-Freewater

Umatilla *county, having a present population of* 3851
(Name of)

and an estimated population of .... *in 19*50.

U-717

Appraised value

14. Estimated cost of proposed works: $ 1,70[illegible]

15. Construction work will begin on or before .... [illegible] 19[illegible]

16. Construction work will be completed on or before ....

17. The water will be completely applied to the proposed use on or before Has been in operation since 19[illegible]

Robert L. Bunton
(Signature of applicant)

City Manager

Remarks: This installation was placed in June 1954.

There is no available log of this well. The driller said that no log was kept at that time. No known record of casing.

STATE OF OREGON, } ss.
County of Marion,

This is to certify that I have examined the foregoing application, together with the accompanying maps and data, and return the same for ....

In order to retain its priority, this application must be returned to the State Engineer, with corrections on or before ...., 19......

WITNESS my hand this .... day of ...., 19...

....
STATE ENGINEER

STATE OF OREGON, }
County of Marion, } ss.

PERMIT

This is to certify that I have examined the foregoing application and do hereby grant the same, SUBJECT TO EXISTING RIGHTS and the following limitations and conditions:

The right herein granted is limited to the amount of water which can be applied to beneficial use and shall not exceed 1.0 *cubic feet per second measured at the point of diversion from the well or source of appropriation, or its equivalent in case of rotation with other water users, from* Well No. 4

The use to which this water is to be applied is [redacted] municipal

If for irrigation, this appropriation shall be limited to - - - - *of one cubic foot per second*

and shall be subject to such reasonable rotation system as may be ordered by the proper state officer.

The well shall be so cased as to prevent the loss of underground water.

The priority date of this permit is April 13, 1955

Actual construction work shall begin on or before July 20, 1956 *and shall thereafter be prosecuted with reasonable diligence and be completed on or before* October 1, 1957

Complete application of the water to the proposed use shall be made on or before October 1, 1958

WITNESS my hand this 20th *day of* July, 19 55.

Lewis A. Stanley
STATE ENGINEER

Application No. U-808

Permit No. U-717

PERMIT

TO APPROPRIATE THE UNDERGROUND WATERS OF THE STATE OF OREGON

This instrument was first received in the office of the State Engineer at Salem, Oregon, on the 13th *day of* April, 1955, *at* 1:00 *o'clock* P. *M.*

Returned to applicant:

Corrected application received:

Approved:

July 20, 1955

Recorded in book No. 3 *of Permits on page* U-717

LEWIS A. STANLEY
STATE ENGINEER

Drainage Basin No. 7 *Page* 246

Fees Paid $20.00

State Printing Dept. 3135

WELL NO. 4 PAGE 5 OF 5

Permit A-1-500

State Printing Dept.

STATE OF OREGON

COUNTY OF UMATILLA

CERTIFICATE OF WATER RIGHT

This Is to Certify, *That* CITY OF MILTON-FREEWATER

of Milton-Freewater, *State of* Oregon, *has made proof to the satisfaction of the* STATE ENGINEER *of Oregon, of a right to the use of the waters of* Well No. 4 *a tributary of* Little Walla Walla River, trib. of Columbia River *for the purpose of* municipal *under Permit No.* U-717 *of the State Engineer; and that said right to the use of said waters has been perfected in accordance with the laws of Oregon; that the priority of the right hereby confirmed dates from* April 13, 1955;

that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed 1.0 cubic foot per second

or its equivalent in case of rotation, measured at the point of diversion from the stream. The point of diversion is located in the SW¼SE¼NE¼, Section 2, Township 5 North, Range 35 East, W.M.

The amount of water used for irrigation, together with the amount secured under any other right existing for the same lands, shall be limited to - - - - - - - - *of one cubic foot per second per acre,*

and shall conform to such reasonable rotation system as may be ordered by the proper state officer.

A description of the place of use under the right hereby confirmed, and to which such right is appurtenant, is as follows:

NW¼NW¼
SW¼NW¼
N½ NE¼SW¼
Section 1
NE¼NW¼
SE¼NW¼
NE¼NE¼
NW¼NE¼
SW¼NE¼
SE¼NE¼
Section 2
Township 5 North, Range 35 East, W.M.

The right to the use of the water for the purposes aforesaid is restricted to the lands or place of use herein described.

WITNESS the signature of the State Engineer, affixed

this 20th *day of* December, 19 57.

LEWIS A. STANLEY
State Engineer

Recorded in State Record of Water Right Certificates, Volume 17, *page* 23532.

WELL NO. 5

Water Right Information Query Results

Contact Information

▼ **Current contact information**

OWNER:
▷ CITY OF MILTON FREEWATER
MILTON FREEWATER, OR 97862

Documents

▶ **Application: U 809** digital map

▶ **Permit: U 718** document, digital map

▶ **Certificate: 23533** document, digital map, paper map

▷ View right with New Web Mapping (beta)

Water Right Information

Status: Non-Cancelled

County: Umatilla

File Folder Location: Salem

Watermaster District: 5

Point(s) of Diversion

▶ **POD 1 - WELL 5 > LITTLE WALLA WALLA RIVER**

Place(s) of Use

▶ **Use - MUNICIPAL USES (Primary); Priority Date: 4/13/1955**

Water Right Genealogy

No genealogy records available for this water right, try the family link below instead.

View Water Rights in same Family

Help understanding and working with the Water Rights Information System

Report Errors with Water Right Data

Return to WRIS Query

WELL NO. 5

23533

RECEIVED
APR 8 1955
STATE ENGINEER
SALEM, OREGON

Permit No. U-718

APPLICATION FOR A PERMIT

To Appropriate the Underground Waters of the State of Oregon

I, Milton-Freewater (Name of applicant)

of Milton-Freewater (Postoffice), county of Umatilla,

state of Oregon, do hereby make application for a permit to appropriate the following described underground waters of the state of Oregon, SUBJECT TO EXISTING RIGHTS:

If the applicant is a corporation, give date and place of incorporation

Milton-Freewater, Oregon January 1, 1951

1. Give name of nearest stream to which the well, tunnel or other source of water development is situated Little Walla Walla River (Name of stream) tributary of Columbia River

2. The amount of water which the applicant intends to apply to beneficial use is 2.7 cubic feet per second.

3. The use to which the water is to be applied is Domestic and Commercial

4. The place where the water is to be pumped or developed is located 2" Iron Pipe is N 32° - 2' E 365.5 ft. of 1/4 corner between sections 1 & 2 T 5 N. R. 35 EWM 37.5 (Give distance and bearing from section corner)
2" pipe is S. 50° - 35' W. of well in S.W. ¼ of N.W.¼ sec. 1 Twp. 5NR. 35 EWM
N.W. ¼

being within the of Sec. , Twp. , R. ,

W. M., in the county of Umatilla

5. The (Canal or pipe line) to be miles in length, terminating in the (Smallest legal subdivision) of Sec. , Twp. R. , W. M., the proposed location being shown throughout on the accompanying map.

6. The name of the well or other works is Well No. 5

DESCRIPTION OF WORKS

7. If the flow to be utilized is artesian, the works to be used for the control and conservation of the supply when not in use must be described.

8. The development will consist of one well (Give number of wells, tunnels, etc.) having a diameter of 8" O.D. Pipe inches and an estimated depth of 502 feet.

This well pumps directly into the water system.

U-718

CANAL SYSTEM OR PIPE LINE—

9. (a) Give dimensions at each point of canal where materially changed in size, stating miles from headgate. At headgate: width on top (at water line) .... feet; width on bottom .... feet; depth of water .... feet; grade .... feet fall per one thousand feet.

(b) At .... miles from headgate: width on top (at water line) .... feet; width on bottom .... feet; depth of water .... feet; grade .... feet fall per one thousand feet.

(c) Length of pipe, ... ft.; size at intake, ... in.; in size at .... ft. from intake .... in.; size at place of use .... in.; difference in elevation between intake and place of use, ... ft. Is grade uniform? .... Estimated capacity, ... sec. ft.

10. If pumps are to be used, give size and type .... Peerless turbine 1200 G.P.M.

Give capacity and type of motor or engine to be used .... 150 H.P. U.S. Motor

11. If the location of the well, tunnel, or other development work is less than one-fourth mile from a natural stream or stream channel, give the distance to be the nearest point on each of such channels and the difference in elevation between the stream bed and the ground surface at the source of development

35 feet to Little Walla Walla River (no difference in elevation)

Little Walla Walla River in reality is a power canal to operate flour mill

12. Location of area to be irrigated, or place of use .... Water system of former City of Freewater

Township	Range	Section	Forty-acre Tract	Number Acres To Be Irrigated
5 N	WILLAMETTE MERIDIAN 35 EWM	1	N.W. ¼ of N.W. ¼	
			S.W. ¼ of N. W. ¼	
			N½ of N.E. ¼ of S.W. ¼	
5 N	35 EWM	2	N/E ¼ of N.W. ¼	
			S.E. ¼ of N.W. ¼	
			N.E. ¼ of N.E. ¼	
			N.W. ¼ of N.E. ¼	
			S.W. ¼ of N.E. ¼	
			S.E. ¼ of N.E. ¼	

(If more space required, attach separate sheet)

(a) Character of soil ....

(b) Kind of crops raised ....

MUNICIPAL SUPPLY—

13. (a) To supply the city of .... To supply portion of City of Milton-Freewater

Umatilla (Name of) .... county, having a present population of 3851 ....

and an estimated population of .... in 1950

WELL NO. 5

U-718

Appraised value

14. Estimated cost of proposed works, $ [illegible]

15. Construction work will begin on or before Completed in 1936

16. Construction work will be completed on or before

17. The water will be completely applied to the proposed use on or before This well has been in operation since 1936

Robert L. Brunton
(Signature of applicant)

City Manager

Remarks: In Item 2, the amount requested is slightly higher than we are now using because some time in the future we may want to put in larger pumps. This was accomplished in June 1954 and the above notes are the status of the present setting.

In case you do not have the log of this well, below is a copy!

Well #5 Drilled by A. A. Durand & Son 1936

Altitude of top of ground above sea level 995

Log

Recent alluvium and old gravel

	Thickness Ft.	Depth Ft.
Soil	3	3
Gravel, loose	77	80
Clay	10	90
Boulders & Gravel	45	135
Clay & Sand	10	145
Gravel & Loose Boulders	15	160
Basalt Black, Hard	85	245
Basalt Red, Porous	45	290
Basalt Blue, Black	115	405
Basalt Red	30	435
Basalt Black Water Bearing	67	502

Casing 18" set to 40 ft.
12" set to 172 ft.

STATE OF OREGON,
County of Marion, } ss.

This is to certify that I have examined the foregoing application, together with the accompanying maps and data, and return the same for

In order to retain its priority, this application must be returned to the State Engineer, with corrections on or before , 19

WITNESS my hand this day of , 19

STATE ENGINEER

PERMIT

STATE OF OREGON, }
County of Marion, } ss.

This is to certify that I have examined the foregoing application and do hereby grant the same, SUBJECT TO EXISTING RIGHTS and the following limitations and conditions:

The right herein granted is limited to the amount of water which can be applied to beneficial use and shall not exceed 2.70 *cubic feet per second measured at the point of diversion from the well or source of appropriation, or its equivalent in case of rotation with other water users, from* Well No. 5

The use to which this water is to be applied is [redacted] municipal

If for irrigation, this appropriation shall be limited to - - - - *of one cubic foot per second*

and shall be subject to such reasonable rotation system as may be ordered by the proper state officer.

The well shall be so cased as to prevent the loss of underground water.

The priority date of this permit is April 13, 1955

Actual construction work shall begin on or before July 20, 1956 *and shall thereafter be prosecuted with reasonable diligence and be completed on or before* October 1, 1957

Complete application of the water to the proposed use shall be made on or before October 1, 1958

WITNESS my hand this 20th *day of* July, 19 55.

Lewis A. Stanley
STATE ENGINEER

Application No. U-809
Permit No. U-718

PERMIT
TO APPROPRIATE THE UNDERGROUND WATERS OF THE STATE OF OREGON

This instrument was first received in the office of the State Engineer at Salem, Oregon, on the 13th *day of* April, 1955, *at* 1:00 *o'clock* P. M.

Returned to applicant:

Corrected application received:

Approved:
July 20, 1955

Recorded in book No. 3 *of Permits on page* U-718

LEWIS A. STANLEY STATE ENGINEER

Drainage Basin No. 7 *Page* 24C

Fees Paid $24.00

State Printing Dept.

WELL NO. 5

PAGE 5 OF 5

STATE OF OREGON

COUNTY OF UMATILLA

CERTIFICATE OF WATER RIGHT

This Is to Certify, That CITY OF MILTON-FREEWATER

of Milton-Freewater, State of Oregon, has made proof to the satisfaction of the STATE ENGINEER of Oregon, of a right to the use of the waters of Well No. 5 a tributary of Little Walla Walla River, trib. of Columbia River for the purpose of municipal under Permit No. U-718 of the State Engineer, and that said right to the use of said waters has been perfected in accordance with the laws of Oregon; that the priority of the right hereby confirmed dates from April 13, 1955;

that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed 2.70 cubic feet per second

or its equivalent in case of rotation, measured at the point of diversion from the stream. The point of diversion is located in the SW¼SW¼NW¼, Section 1, Township 5 North, Range 35 East, W.M.

The amount of water used for irrigation, together with the amount secured under any other right existing for the same lands, shall be limited to - - - - - - - - - of one cubic foot per second per acre,

and shall conform to such reasonable rotation system as may be ordered by the proper state officer.

A description of the place of use under the right hereby confirmed, and to which such right is appurtenant, is as follows:

NW¼NW¼
SW¼NW¼
N½ NE¼SW¼
Section 1
NE¼NW¼
SE¼NW¼
NE¼NE¼
NW¼NE¼
SW¼NE¼
SE¼NE¼
Section 2
Township 5 North, Range 35 East, W.M.

The right to the use of the water for the purposes aforesaid is restricted to the lands or place of use herein described.

WITNESS the signature of the State Engineer, affixed this 20th day of December, 1957.

LEWIS A. STANLEY
State Engineer

Recorded in State Record of Water Right Certificates, Volume 17, page 23533.

WELL NO. 8

Water Right Information Query Results

Contact Information

- Current contact information

OWNER:
CITY OF MILTON FREEWATER
BOX 108
MILTON FREEWATER, OR 97862

Water Right Information

Status: Non-Cancelled

County: Umatilla

File Folder Location: Salem

Watermaster District: 5

Documents

View all scanned documents

- **Application: G 2502** digital map
- **Permit: G 2312** document, digital map
- **Certificate: 41011** document, digital map, paper map
- **Order(s)**
- View right with New Web Mapping (beta)

Point(s) of Diversion

- **POD 1 - WELL 8 > WALLA WALLA RIVER**

Place(s) of Use

Add TRS grouping

- **Use - MUNICIPAL USES (Primary); Priority Date: 12/13/1962**

Water Right Genealogy

No genealogy records available for this water right, try the family link below instead.

View Water Rights in same Family

Help understanding and working with the Water Rights Information System

Report Errors with Water Right Data

Return to WRIS Query

WELL NO. 8 PAGE 1 OF 5

41011

Permit No. G-2312

APPLICATION FOR A PERMIT

To Appropriate the Ground Waters of the State of Oregon

I, City of Milton-Freewater, a municipal corporation (Name of applicant)

of Box 108 Milton-Freewater (Postoffice Address), county of Umatilla,

state of Oregon, do hereby make application for a permit to appropriate the following described ground waters of the state of Oregon, SUBJECT TO EXISTING RIGHTS:

If the applicant is a corporation, give date and place of incorporation

December 27, 1950 at Milton-Freewater, Oregon

1. Give name of nearest stream to which the well, tunnel or other source of water development is situated Walla Walla River (Name of stream)

tributary of Columbia River

2. The amount of water which the applicant intends to apply to beneficial use is 6.6 cubic feet per second or 3000 gallons per minute.

3. The use to which the water is to be applied is Municipal Supply

4. The well or other source is located ... ft. (N. or S.) and ... ft. (E. or W.) from the ... corner of ... (Section or subdivision)

The well lies N. 33°35' East a distance of 2143' from the S. W. corner (If preferable, give distance and bearing to section corner)

of Section 18, Township 5 North, Range 36 East of Willamet Meridian. (If there is more than one well, each must be described. Use separate sheet if necessary)

being within the S. W. ¼ (NW¼ SW¼) of Sec. 18, Twp. 5 N., R. 36 E., W. M., in the county of Umatilla

5. The Pipeline (Canal or pipe line) to be 5.9 miles in length, terminating in the S. W. ¼ of S. E. ¼ (Smallest legal subdivision) of Sec. 12, Twp. 5N., R. 35 E., W. M., the proposed location being shown throughout on the accompanying map.

6. The name of the well or other works is Milton-Freewater Well No.8

DESCRIPTION OF WORKS

7. If the flow to be utilized is artesian, the works to be used for the control and conservation of the supply when not in use must be described.

Capped well with discharge tee and gate valve

8. The development will consist of a well (Give number of wells, tunnels, etc.) having a diameter of 16 inches and an estimated depth of 1000 feet. It is estimated that 30 feet of the well will require Steel (Kind) casing. Depth to water table is estimated 10 (Feet)

01- -1336

G-2312

CANAL SYSTEM OR PIPE LINE—

9. *(a) Give dimensions at each point of canal where materially changed in size, stating miles from headgate. At headgate: width on top (at water line)* .... *feet; width on bottom* .... *feet; depth of water* .... *feet; grade* .... *feet fall per one thousand feet.*

(b) At .... *miles from headgate: width on top (at water line)* .... *feet; width on bottom* .... *feet; depth of water* .... *feet; grade* .... *feet fall per one thousand feet.*

(c) Length of pipe, 4800 *ft.; size at intake,* 12" *in.; in size at* 2500 *ft. from intake* 12 *in.; size at place of use* 12 *in.; difference in elevation between intake and place of use,* 165 *ft. Is grade uniform?* Approximate *Estimated capacity,* 8 *sec. ft.*

10. *If pumps are to be used, give size and type* 3000 GPM vertical turbine

Give horsepower and type of motor or engine to be used 150 HP VHS squirrel cage electric

11. *If the location of the well, tunnel, or other development work is less than one-fourth mile from a natural stream or stream channel, give the distance to the nearest point on each of such channels and the difference in elevation between the stream bed and the ground surface at the source of development* 100 ft. from channel or Walla Walla River. Stream bed is approximately 10 ft. below elevation of ground at well site.

12. *Location of area to be irrigated, or place of use* City of Milton-Freewater

Township N. or S.	Range E. or W. of Willamette Meridian	Section	Forty-acre Tract	Number Acres To Be Irrigated
5 North	35 East	1,2,11,12		2500
		1	NW¼ and SW¼	municipal
		2	NE¼ and SE¼	"
			E½ NW¼	"
			NE¼ SW¼	"
		11	NE¼ NE¼	"
		12	W½ NE¼	"
			NW¼	"
			E½ SW¼	"
			NW¼ SW¼	"
			SE¼	"

(If more space required, attach separate sheet)

Character of soil gravel

Kind of crops raised ....

G- 2312

MUNICIPAL SUPPLY—

13. To supply the city of Milton-Freewater

in Umatilla county, having a present population of 4110 per 1960 census

and an estimated population of 5654 in 1980

ANSWER QUESTIONS 14, 15, 16, 17 AND 18 IN ALL CASES

14. Estimated cost of proposed works, $50,000

15. Construction work will begin on or before July 1, 1963

16. Construction work will be completed on or before July 1, 1964

17. The water will be completely applied to the proposed use on or before July 1, 1964

18. If the ground water supply is supplemental to an existing water supply, identify any application for permit, permit, certificate or adjudicated right to appropriate water, made or held by the applicant. Permit #7830, #2391 - Well Permits: U-462, U-150, U-717, U-718 U-102, U-172.

(Signature of applicant) City Recorder

Remarks:

STATE OF OREGON, }
County of Marion, } ss.

This is to certify that I have examined the foregoing application, together with the accompanying maps and data, and return the same for

In order to retain its priority, this application must be returned to the State Engineer, with corrections on or before ...., 19......

WITNESS my hand this .... day of ...., 19......

STATE ENGINEER

By ....

ASSISTANT

WELL NO. 8 PAGE 4 OF 5

STATE OF OREGON, }
County of Marion, } ss.

PERMIT

This is to certify that I have examined the foregoing application and do hereby grant the same, SUBJECT TO EXISTING RIGHTS and the following limitations and conditions:

The right herein granted is limited to the amount of water which can be applied to beneficial use and shall not exceed 6.6 *cubic feet per second measured at the point of diversion from the well or source of appropriation, or its equivalent in case of rotation with other water users, from* well No. 8

The use to which this water is to be applied is municipal

If for irrigation, this appropriation shall be limited to - - *of one cubic foot per second or its equivalent for each acre irrigated and shall be further limited to a diversion of not to exceed .... acre feet per acre for each acre irrigated during the irrigation season of each year;*

and shall be subject to such reasonable rotation system as may be ordered by the proper state officer.

The well shall be cased as necessary in accordance with good practice and if the flow is artesian the works shall include proper capping and control valve to prevent the waste of ground water.

The works constructed shall include an air line and pressure gauge or an access port for measuring line, adequate to determine water level elevation in the well at all times.

The permittee shall install and maintain a weir, meter, or other suitable measuring device, and shall keep a complete record of the amount of ground water withdrawn.

The priority date of this permit is December 13, 1962

Actual construction work shall begin on or before March 15, 1964 *and shall thereafter be prosecuted with reasonable diligence and be completed on or before October 1, 19*64.

*Complete application of the water to the proposed use shall be made on or before October 1, 19*65.

WITNESS my hand this 15th *day of* March, 19 63

[signature]
STATE ENGINEER

Application No. G- 2502

Permit No. G- 2312

PERMIT

TO APPROPRIATE THE GROUND WATERS OF THE STATE OF OREGON

This instrument was first received in the office of the State Engineer at Salem, Oregon, on the 13d *day of* December, *19*62, *at* 1:00 *o'clock* P. *M.*

Returned to applicant:

Approved:
March 15, 1963

Recorded in book No. 9 *of Ground Water Permits on page* 2312

CHRIS L. WHEELER
STATE ENGINEER

Drainage Basin No. 7 *page* 52

State Printing

WELL NO. 8

Permit A—4M—7-70

STATE OF OREGON

COUNTY OF UMATILLA

CERTIFICATE OF WATER RIGHT

This Is to Certify, That CITY OF MILTON-FREEWATER

of Box 108, Milton-Freewater 97862, State of Oregon, has made proof to the satisfaction of the STATE ENGINEER of Oregon, of a right to the use of the waters of Well No. 8

a tributary of Walla Walla River for the purpose of municipal

under Permit No. G-2312 of the State Engineer, and that said right to the use of said waters has been perfected in accordance with the laws of Oregon; that the priority of the right hereby confirmed dates from December 13, 1962

that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed 3.90 cubic feet per second

or its equivalent in case of rotation, measured at the point of diversion from the stream. The point of diversion is located in the NW¼ SW¼, Section 18, T. 5 N., R. 36 E., W. M., 1620 feet North and 1170 feet East from SW Corner, Section 18.

The amount of water used for irrigation, together with the amount secured under any other right existing for the same lands, shall be limited to -------------- of one cubic foot per second per acre,

and shall conform to such reasonable rotation system as may be ordered by the proper state officer.

A description of the place of use under the right hereby confirmed, and to which such right is appurtenant, is as follows:

W½
Section 1
N½
NE¼ SW¼
SE¼
Section 2
NE¼ NE¼
Section 11
W½ NE¼
NW¼
N½ SW¼
SE¼ SW¼
SE¼
Section 12
T. 5 N., R. 35 E., W. M.

NE¼ NE¼
Section 13
T. 5 N., R. 35 E., W. M.

SW¼ NW¼
NW¼ SW¼
Section 18
T. 5 N., R. 36 E., W. M.

SE¼ SW¼
SE¼
Section 35
SW¼ SW¼
Section 36
T. 6 N., R. 35 E., W. M.

The right to the use of the water for the purposes aforesaid is restricted to the lands or place of use herein described.

WITNESS the signature of the State Engineer, affixed

this date. October 24, 1974

Chris L. Wheeler
State Engineer

Recorded in State Record of Water Right Certificates, Volume 33, page 41011

APPENDIX F

Area Well Logs

STATE ENGINEER
Salem, Oregon

UMAT 3908

OBSERVATION WELL
Well Record

STATE WELL NO. 5N/35-1E(1)
COUNTY UMATILLA
APPLICATION NO. U-165

OWNER: KEY EQUIPMENT Co. (UTAH CAN) MAILING ADDRESS: MILTON FREEWATER

LOCATION OF WELL: Owner's No. #1 CITY AND STATE:

SW¼ NW¼ Sec. 1 T. 5 N., R. 35 E., W.M.

Bearing and distance from section or subdivision corner

Altitude at well

TYPE OF WELL: DRILLED Date Constructed 2-16-45

Depth drilled 528' Depth cased 109'3"

Section 1

CASING RECORD:
16 INCH

FINISH:

AQUIFERS:
BASALT

WATER LEVEL:
49' (2-16-45)

PUMPING EQUIPMENT: Type H.P.
Capacity G.P.M.

WELL TESTS: SEE PUMP TEST INFO
Drawdown ft. after hours G.P.M.
Drawdown ft. after hours G.P.M.

USE OF WATER MUNICIPAL Temp. °F. , 19
SOURCE OF INFORMATION U-158
DRILLER or DIGGER A.A. DURAND & SON
ADDITIONAL DATA:
Log ✓ Water Level Measurements ✓ Chemical Analysis ✓ Aquifer Test

REMARKS:

State Printing 89316

STATE ENGINEER
Salem, Oregon

State Well No. 5N/35-1E(1)

County UMATILLA

Application No. U-165

Water Level Record

OWNER: KEY EQUIPMENT CO. (UTAH CANNING CO.) OWNER'S NO.

Description of measuring point: OWNERS AIRLINE & GAGE (197' LINE)

Date	Water Level Feet (above) (below) Land Surface	Remarks	Date	Water Level Feet (above) (below) Land Surface	Remarks
11-9-61	105'	RD & WSB.			
11-4-63	128				
11-18	120				
12-2	120				
12-21	112				
1-6-64	112				
1-20	114				
2-3	113				
2-17	112				
3-3	107				
3-17	107				
4-7	105				
4-27	105				
5-4	103				
6-1	103				
9-29	132				
10-12	132				
11-16	130				

REMARKS:

State Printing 89314

UMAT
6509

RECEIVED
MAR 5 1945
STATE ENGINEER
SALEM, OREGON

5N/35-1E(1)

Application No. U-165
Permit No. U - 158
Well No. 1

REPORT ON COMPLETION OF WELL

(Note: This report should be submitted to the State Engineer, Salem, Oregon, as soon as possible after the well is completed. If more than one well is covered by this permit, a separate report shall be filed for each)

Utah Canning Co.

Date of Report Feb. 28, ~~193~~1945

1. Location of well SW¼ of NW¼ of Section 1 Twp. 5N Rge. 35 E, W. M.
2. Name of nearest natural surface stream Walla Walla River
3. Distance from well to that stream: 1800 feet.
4. If the well is less than 1300 feet from a natural surface stream, give the difference in elevation between the ground surface at the well and the lowest point in stream channel: ------- feet.
5. Date of beginning drilling or digging Nov. 21, 1944
6. Date well was completed Feb. 16, 1945

7. LOG OF MATERIALS ENCOUNTERED

Character of Material	Depth at which encountered	Thickness of stratum
	At surface	ft.
	ft.	ft.
	ft.	ft.
See attached Chronology of	ft.	ft.
Well.	ft.	ft.
	ft.	ft.
	ft.	ft.
	ft.	ft.
	ft.	ft.

Remarks:

WELL INFORMATION

8. Diameter of well 16 inches. Depth of well 528 feet.
9. Depth at which water was first encountered ± 22 feet.
10. Water level when completed: 49 feet below ground surface.
11. Additional information regarding well; such as soil conditions, quick sand, caves, obstructions, rock, etc.:

Note: You will find attached Test Pumping Record of this well.

The Utah Canning Company
By [signature]
Geo. M. Martin

ENGINEERING DEPARTMENT DU PONT COMPUTATION SHEET

"135-1E(1)" SHEET NO.

A. A. DURAND & SONS
WELL DRILLING CONTRACTOR
215 Reese Avenue
WALLA WALLA, WASHINGTON

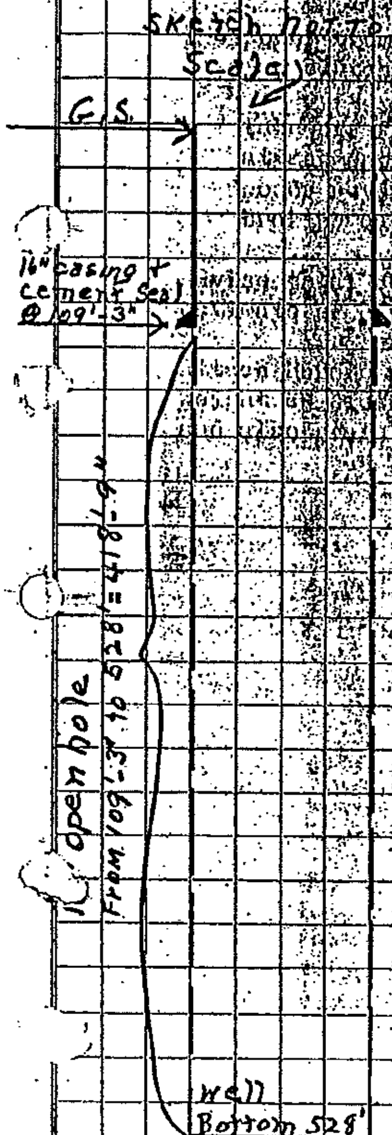
PROJ. NO. WORKS

COMPUTER P.A.D. DATE March 1, 1945

Utah Canning Company, Freewater, Oregon.
Drilled during period November 21, 1944 to
February 16, 1945

Plant Well No. 1
Located in SW¼ of NW¼
of Sec. 1, TWP5N, R35E

WELL CHRONOLOGY



Depth From	Depth To	Formation	S.W.L.	Comments
Ground Surface	20'	Gravel & boulders		
20'	30'	Gravel	22'	
30'	55'	Clay & Gravel		
55'	64'	Pure Gravel		
64'	92'	Yellow Clay & Gravel		
92'	107'	Solid Black Basalt		End of 20" Drilling. 16" O.D. casing seated at 109' 3".
107'	114'	Black Basalt & Blue shale		
114'	118'	Black Basalt		
118'	125'	Gray & Brown Basalt and Blue Shale		
125'	145'	Gray Basalt & Blue Shale		
145'	156'	Gray, Red & Brown Basalt and Blue Shale	22'	
156'	158'	Gray & Brown Basalt with Blue Clay	15'	
158'	186'	Black Basalt		
186'	193'	Black & Red Basalt with little Yellow Clay		
193'	198'	Black Basalt		
198'	205'	Black Basalt & Blue Shale		
205'	213'	Black & Red Basalt with Yellow Clay		
213'	221'	Hard Black Basalt		
221'	228'	Black Basalt with little Yellow Clay		
228'	233'	Hard Black Basalt	16'	
233'	235'	Gray Basalt	16' 6"	
235'	292'	Hard Blue Basalt		
292'	401'	Hard Gray Basalt		
401'	437'	Hard Black Basalt		
437'	468'	Hard Gray Basalt		
468'	528'	Soft & Hard Black Basalt		Cement seal (1504#) set at the bottom of 16" by bridging below 16" pipe, filling same with cement and driving wood plug down and forcing cement around behind 16" casing. Was done when well was drilled to 496' level. Then cement & cement bridge drilled out at which time S.W.L. changed from 16' 6" to 41' 5"

Pump Test #1 conducted Feb. 16 and 17, 1945, 24 hours continuous. S.W.L. 49'.

Mean Pumping Points as follows:

Dynamic W.L.	G.P.M.
70'	1029
73½'	1040
79½'	1265
81'	1550

STATE ENGINEER
Salem, Oregon

State Well No. 5/35-1E1

County Umatilla

Application No.

Chemical Analysis

OWNER Utah Canning Co. OWNER'S NO.

ANALYST Ore. State Board of Health Address

Date of Collection 1945

Point of Collection

	P.P.M.	E.P.M.
Silica (SiO_2)		
Iron (Fe) Total		
Manganese (Mn)		
Calcium (Ca)	16.	
Magnesium (Mg)	8.5	
Sodium (Na)	14.	
Potassium (K)		
Bicarbonate (HCO_3)	90.	
Carbonate (CO_3)		
Sulfate (SO_4)		
Chloride (Cl)		
Fluoride (F)		
Nitrate (NO_3)		
Boron (B)		
Dissolved Solids		
Hardness as $CaCO_3$	74.	
Specific Conductance (Micromhos at 25°C)		
pH		
Percent Sodium		
Sodium Absorption Ratio (S.A.R.)		
CLASS		

State Printing 80318

The Utah Canning Company

GENERAL OFFICE
OGDEN, UTAH

PLANTS AT
OGDEN, UTAH
FREEWATER, OREGON

Freewater, Oregon
May 24, 1950

Mr. Chas. E. Stricklin, State Engineer
State of Oregon,
Salem, Oregon

Dear Sir:

Re: File No. 165

We are holder of Water Right Certificate No. 1551 under Permit No. U-158.

Due to the drop in water tables in this area last year we have been checking the water level in our well for depth below ground level weekly since Feb. 13, 1950 and find the following;

Feb. 13 -70'	Mar. 20 -65'	Apr. 17 -59'	May 15 -63
Feb. 27 -70	Mar. 27 -62	Apr. 24 -59	May 22 -65
Mar. 6 -68	Apr. 3 -62	May 1 -57'	
Mar. 13 -65	Apr. 10 -60	May 8 -57	

You will note that we had a build up for awhile and now the table is lowering.

When we started using our well in the 1949 season about June 10th the level was 59' below ground level and after pumping for 8 hours we had dropped somewhere below 100', how far below that we do not know as our gauge is only set for 100'.

It is very evident that there are too many wells on the same basin that we are on.

What we would like to know is, does a well that was proven at a certain time have priority over wells that were proven at later dates.

Very truly yours,

Utah Canning Company

Geo. M. Martin
Manager

5N/35-1E1
UMATILLA

Water level from ground surface. Utah Canning Company, Freewater, Oregon well - Permit No. U-~~165~~158

Date	Feet
Feb. 13, 1950	70 - Not Pumping
Feb. 27, 1950	70 - Not Pumping
March 6, 1950	68 - Not Pumping
March 13, 1950	65 - Not Pumping
March 20, 1950	65 - Not Pumping
March 27, 1950	62 - Not Pumping
April 3, 1950	62 - Not Pumping
April 10, 1950	60 - Not Pumping
April 17, 1950	59 - Not Pumping
April 24, 1950	59 - Not Pumping
May 1, 1950	57 - Not Pumping
May 8, 1950	57 - Not Pumping
May 15, 1950	63 - Not Pumping
May 16, 1950	63 - Not Pumping
May 17, 1950	63 - Not Pumping
May 22, 1950	65 - Not Pumping
May 31, 1950	70 - Not Pumping
June 5, 1950	70 - Not Pumping
June 12, 1950	74 - Not Pumping
June 13, 1950	73 - Not Pumping
June 14, 1950	75 - Not Pumping
June 15, 1950	73 - Not Pumping
June 16, 1950	73 - Not Pumping
June 19, 1950	73 - Not Pumping
June 20, 1950	74 - Started Pumping
June 21, 1950	95 - Pumping
June 22, 1950	93 - Pumping
June 23, 1950	93 - Pumping
June 24, 1950	94 - Pumping
June 25, 1950	98 - Pumping
June 26, 1950	100 - Pumping
June 27, 1950	100 - Pumping
June 28, 1950	98 - Pumping
June 29, 1950	99 - Pumping
June 30, 1950	103 - Pumping
July 1, 1950	100 - Pumping
July 2, 1950	103 - Pumping
July 3, 1950	105 - Pumping
July 4, 1950	107 - Pumping
July 5, 1950	109 - Pumping
July 6, 1950	106 - Pumping
July 7, 1950	110 - Pumping
July 8, 1950	103 - Pumping
July 9, 1950	105 - Pumping
July 10, 1950	105 - Pumping
July 11, 1950	102 - Pumping
July 12, 1950	103 - Pumping
July 13, 1950	110 - Pumping
July 14, 1950	110 - Pumping

RECEIVED
JAN 9 1951
STATE ENGINEER
SALEM, OREGON

5N/35-1E1
UMATILLA

Water level from ground surface. Utah Canning Company, Freewater, Oregon well - Permit No. U-~~165~~ 159

Date	Feet
July 15, 1950	105 - Pumping
July 16, 1950	103 - Pumping
July 17, 1950	103 - Pumping
July 18, 1950	100 - Stopped Pumping
July 19, 1950	105 - Not Pumping
July 20, 1950	100 - Not Pumping
July 21, 1950	98 - Not Pumping
July 24, 1950	95 - Not Pumping
July 25, 1950	88 - Not Pumping
July 26, 1950	88 - Not Pumping
July 27, 1950	87 - Not Pumping
Aug. 3, 1950	87 - Not Pumping
Aug. 9, 1950	85 - Not Pumping
Aug. 11, 1950	85 - Not Pumping
Aug. 14, 1950	84 - Not Pumping
Aug. 18, 1950	83 - Not Pumping
Aug. 22, 1950	82 - Not Pumping
Aug. 30, 1950	78 - Not Pumping
Sept. 7, 1950	78 - Not Pumping
Sept. 12, 1950	79 - Not Pumping
Sept. 20, 1950	80 - Not Pumping
Sept. 26, 1950	80 - Not Pumping
Oct. 2, 1950	76 - Not Pumping
Oct 12, 1950	73 - Not Pumping
Oct. 17, 1950	73 - Not Pumping
Oct. 24, 1950	72 - Not Pumping
Nov. 1, 1950	72 - Not Pumping
Nov. 8, 1950	72 - Not Pumping
Nov. 20, 1950	72 - Not Pumping
Nov. 27, 1950	71 - Not Pumping
Dec. 6, 1950	69 - Not Pumping
Dec. 11, 1950	68 - Not Pumping
Dec. 19, 1950	67 - Not Pumping
Dec. 26, 1950	66 - Not Pumping

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STATE ENGINEER
SALEM, OREGON

5N/35-1E(1)
UMATILLA CO.

Water level from ground surface. Utah Canning Company, Milton-Freewater, Oregon well - PERMIT No. U-158, for the year 1951

Date	Feet
1/2	66 - Not Pumping
1/8	66 - " "
1/16	66 " "
1/22	65 " "
1/29	67 " "
2/5	68 " "
2/13	71 " "
2/20	73 " "
2/28	74 " "
3/5	76 " "
3/12	76 " "
3/19	76 " "
3/26	74 " "
4/3	62 " "
4/10	63 " "
4/17	64 " "
4/23	64 " "
4/30	63 " "
5/8	63 " "
5/14	61 " "
5/23	63 " "
6/4/	64 - Started Pumping
6/5	85 - Pumping
6/9	85NotPumping
6/11	88 " "
6/15	84 " "
6/17	95 Pumping
6/18	98 "
6/19	100 "
6/20	100 "
6/21	100 "
6/22	102 "
6/23	100 "
6/24	105 "
6/25	102 "
6/26	108 "
6/27	105 "
6/28	105 "
6/29	105 "
6/30	107 "
7/1	107 "
7/2	107 "
7/3	105 "
7/4	105 "
7/5	107 "
7/6	109 "
7/7	101 "
7/8	107 "
7/9	107 "
7/10	103 "
7/11	109 "

Date	Feet
7/12	107 - Pumping
7/13	102 "
7/14	105 "
7/15	103 - " (Last Day)
7/18	92 Not Pumping
7/25	89 " "
7/31	87 " "
8/8	85 " "
8/15	83 " "
8/23	83 " "
8/31	82 " "
9/7	80 " "
9/14	78 " "
9/21	78 " "
9/28	77 " "
10/5	75 " "
10/11	77 " "
10/18	75 " "
10/22	75 " "
10/30	75 " "
11/9	74 " "
11/16	74 " "
11/19	74 " "
11/29	75 " "
12/3	75 " "
12/10	75 " "
12/17	74 " "
12/27	73 " "
12/31	73 " "

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JAN 14 1952
STATE ENGINEER
SALEM, OREGON

RECEIVED
FEB 6 1954
STATE ENGINEER
SALEM, OREGON

5N/35-1E(1)
UMATILLA CO

Water level from ground surface. Utah Canning Company, Milton-Freewater Oregon - Well #1 - Permit No. U-158, for the year 1953.

1953	Ft.	
1/8	74	Not Pumping
1/15	75	" "
1/22	77	" "
1/26	77	" "
2/2	79	" "
2/16	78	" "
2/23	81	" "
3/2	83	" "
3/9	79	" "
3/16	79	" "
3/23	78	" "
3/30	78	" "
4/6	78	" "
4/27	73	" "
5/4	73	" "
5/11	77	" "
5/18	81	" "
5/25	83	" "
6/2	76	" "
6/8	74	" "
6/15	78	" "
6/22	83	" "
6/30	110	Pumping
7/1	115	"
7/2	112	"
7/3	115	"
7/4	113	"
7/5	114	"
7/6	112	"
7/7	114	"
7/8	114	"
7/9	114	"
7/10	115	"

1953	Ft.	
7/11	119	Pumping
7/12	117	"
7/13	116	"
7/14	117	"
7/15	117	"
7/16	115	"
7/17	118	"
7/18	110	"
7/20	111	"
7/27	93	Not Pumping
8/5	91	" "
8/10	89	" "
8/17	86	" "
8/24	84	" "
8/31	82	" "
9/8	80	" "
9/15	83	" "
9/22	84	" "
9/28	76	" "
10/5	74	" "
10/12	72	" "
10/19	73	" "
10/26	70	" "
11/2	69	" "
11/9	67	" "
11/16	71	" "
11/23	73	" "
11/30	78	" "
12/7	78	" "
12/14	80	" "
12/21	80	" "
12/28	81	" "

5N/35 -12 G(1)
UMATILLA

Rogers Canning Co

RECEIVED
AUG 17 1944
STATE ENGINEER
SALEM, OREGON

Application No. U-157
Permit No. U-151
Well No. Milton #1

UMAT 3963

REPORT ON COMPLETION OF WELL

(Note: This report should be submitted to the State Engineer, Salem, Oregon, as soon as possible after the well is completed. If more than one well is covered by this permit, a separate report shall be filed for each)

Date of Report August 10, 1944

1. Location of well: SW¼ of the NE¼ of Section 12 Twp. 5 Rge. 35, W. M.
2. Name of nearest natural surface stream Walla Walla River
3. Distance from well to that stream: 703 feet.
4. If the well is less than 1300 feet from a natural surface stream, give the difference in elevation between the ground surface at the well and the lowest point in stream channel: same elevation feet.
5. Date of beginning drilling or digging February 5, 1944
6. Date well was completed April 20, 1944

7. LOG OF MATERIALS ENCOUNTERED

Character of Material	Depth at which encountered	Thickness of stratum
	At surface	ft.
	ft.	ft.
	ft.	ft.
	ft.	ft.
	ft.	ft.
	ft.	ft.
	ft.	ft.
	ft.	ft.
	ft.	ft.

Remarks: (See attached list)

WELL INFORMATION

8. Diameter of well 16 inches. Depth of well 702' 6" feet.
9. Depth at which water was first encountered 16 feet.
10. Water level when completed: 117 feet below ground surface.
11. Additional information regarding well; such as soil conditions, quick sand, caves, obstructions, rock, etc.: Caving at 48' and 182'

RECEIVED
JUN 20 1951
STATE ENGINEER
SALEM. OREGON

SN/35 - 12 G(2)
UMATILLA

Rogers Canning Co

Application No. U 380
Permit No. U 355
Well No. Milton #2

UMAT 3964

REPORT ON COMPLETION OF WELL

(Note: This report should be submitted to the State Engineer, Salem, Oregon, as soon as possible after the well is completed. If more than one well is covered by this permit, a separate report shall be filed for each)

Date of Report 18 June , 19 51

1. Location of well: SW¼ NE¼ of Section 12 Twp. 5 Rge. 35 E, W. M.
2. Name of nearest natural surface stream Walla Walla River
3. Distance from well to that stream: 50 feet.
4. If the well is less than 1300 feet from a natural surface stream, give the difference in elevation between the ground surface at the well and the lowest point in stream channel: 10 feet.
5. Date of beginning drilling or digging. 8 January 1951
6. Date well was completed 14 June 1951

7. LOG OF MATERIALS ENCOUNTERED

Character of Material	Depth at which encountered	Thickness of stratum
Gravel	At surface	24 ft.
Gravel and boulders	24 ft.	18' 10" ft.
Black basalt	42' 10" ft.	31' 9" ft.
Black basalt, gravel and clay	74 ft.	6 ft.
Black basalt	80 ft.	87 ft.
Red and brown basalt	167 ft.	15 ft.
Black basalt	182 ft.	216 ft.
Gray basalt	398 ft.	32 ft.
Black basalt	430 ft.	130 ft.
~~Remarks~~: Black basalt-broken	560	

Remarks. First water crystals in rock 394' to 396'. Traveling stream of water at 464'. Washed cuttings away. Traveling stream of water 524' to 528'. Traveling stream 552' to 560'. Cuttings washed away wherever traveling stream encountered.

WELL INFORMATION

8. Diameter of well 16" inches. Depth of well 560 feet.
9. Depth at which water was first encountered 283 feet.
10. Water level when completed: 125 feet below ground surface.
11. Additional information regarding well; such as soil conditions, quick sand, caves, obstructions, rock, etc.: Water level ~~at~~ in well stood at 34' when drilling had reached 270'. Water level in well dropped to 120' below the surface of ground when well had been drilled to 283'. Water level in well dropped to 125' when drilling reached a depth of 297' and remained at that level until completion of drilling at a depth of 560'.

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the STATE ENGINEER, SALEM, OREGON 97310 within 30 days from the date of well completion.

RECEIVED
SEP 18 1968
STATE ENGINEER
SALEM OREGON

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

UMAT 3899

State Well No. 5N/35-1AB
State Permit No. ______

(1) OWNER:
Name J. Frank Schmidt & Son Co.
Address 23000 S. E. Stark St.; Troutdale, Oregon 97060

(2) TYPE OF WORK (check):
New Well XX Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☐ Driven ☐
Cable ☒ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☐
Irrigation XX Test Well ☐ Other ☐

([illegible]) CASING INSTALLED:
Threaded ☐ Welded XX

12" Diam. from 0 ft. to 356 ft. Gage .375
10" Diam. from 333 ft. to 562 ft. Gage .250
" Diam. from ______ ft. to ______ ft. Gage ______

([illegible]) PERFORATIONS:
Perforated? XX Yes ☐ No.
Type of perforator used cutting torch
Size of perforations 3/8 in. by 4 in.
4 per ft. perforations from 442 ft. to 542 ft.
______ perforations from ______ ft. to ______ ft.
______ perforations from ______ ft. to ______ ft.
______ perforations from ______ ft. to ______ ft.
______ perforations from ______ ft. to ______ ft.

(7) SCREENS:
Well screen installed? ☐ Yes XX No
Manufacturer's Name ______
Type ______ Model No. ______
Diam. ______ Slot size ______ Set from ______ ft. to ______ ft.
Diam. ______ Slot size ______ Set from ______ ft. to ______ ft.

(8) WATER LEVEL: Completed well.
Static level 302' 2" ft. below land surface Date 6/27/68
[illegible]an pressure ______ lbs. per square inch Date ______

(9) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? XX Yes ☐ No If yes, by whom? driller
Yield: 925 gal./min. with 25 ft. drawdown after 72 hrs.
805 " 22 " 48 "
" 708 " 16 " 24 "
Bailer test ______ gal./min. with ______ ft. drawdown after ______ hrs.
Artesian flow ______ g.p.m. Date ______
Temperature of water 66 Was a chemical analysis made? ☐ Yes XX No

(10) CONSTRUCTION:
Well seal—Material used Bentonite
Depth of seal 0 to 60 ft.
Diameter of well bore to bottom of seal 16 in.
Were any loose strata cemented off? XX Yes ☐ No Depth 440
Was a drive shoe used? XX Yes ☐ No
Did any strata contain unusable water? ☐ Yes XX No
Type of water? ______ depth of strata ______
Method of sealing strata off ______
Was well gravel packed? ☐ Yes XX No Size of gravel: ______
Gravel placed from ______ ft. to ______ ft.

(11) LOCATION OF WELL:
County Umatilla Driller's well number ______
NW ¼ NE ¼ Section 1 T. 5N R. 35 E. W.M.
Bearing and distance from section or subdivision corner
2' W. of E. line and 20' N. of S. line of NW ¼ of NE ¼

(12) WELL LOG:
Diameter of well below casing 10"
Depth drilled 660 ft. Depth of completed well 660 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level as drilling proceeds. Note drilling rates.

MATERIAL	From	To	SWL
Soil	0	12	
Small Gravel	12	28	
Cement Gravel	28	60	
Sand and Gravel	60	82	
Brown Clay and small Gravel	82	127	
Brown Clay, Gravel and Boulder	127	203	
Blue Clay	203	288	
Brown Clay and Boulders	288	326	
Light Green and Brown Clay	326	347	
Blue Basalt Rock	347	435	
Broken Blue Basalt Rock	435	440	
Hard Gray Basalt	440	449	
Honeycomb Blue Basalt (1st Wtr	449	455	280
Broken Black Basalt	455	550	
Blue Basalt	550	624	
Honeycomb Black Basalt (Water)	624	653	300
Black Basalt	653	660	

Work started 12 Feb 1968 Completed June 1968
Date well drilling machine moved off of well 2 July 1968

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] Thomas R Ruther (Drilling Machine Operator) Date 17 Sept 1968
Drilling Machine Operator's License No. 138

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
NAME Thomas R. Ruther (Person, firm or corporation) (Type or print)
Address 1421 Circle Drive; Walla Walla, Wash.
[Signed] Thomas R Ruther (Water Well Contractor)
Contractor's License No. 374 Date 17 Sept. 1968

(USE ADDITIONAL SHEETS IF NECESSARY)

5/35- 1
Umatilla

UNITED STATES
DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

GROUND WATER BRANCH
Box 3418 - 623 Post Office Building
Portland 8, Oregon

March 30, 1951

RECEIVED
APR 2 1951
STATE ENGINEER
SALEM, OREGON

Mr. Robert L. Brunton, City Manager
City Hall
Milton-Freewater, Oregon

Dear Mr. Brunton:

In regard to your March 23 inquiry for records bearing on your plan to secure more water from the wells of the former city of Freewater by increasing the pump capacity:

Of the two city wells, excluding the recent nonproductive "fault-zone" well, this office has some records on the younger "Main Street" well, but little data on the older "City Hall" well. Of the older well I could not even learn the depth, casing, diameter, or driller, though I have it on my list for additional canvassing. I believe Durand drilled it years ago and I have meant to ask him about it. It was equipped with a pump of 250-gallons-per-minute capacity when I saw it, but I could not determine its pumping water level and static water level from the pumpman or by entry into the well myself.

On the newer well we have a log taken from the driller's record. A copy is enclosed in case you do not have one. I did not get the static water level but from known static water levels of wells in that vicinity, I assumed it was somewhere near 40 feet during the winter months. A pumping test run at the time the well was finished in 1936 showed 750 gallon per minute with water level drawn down to 47 feet below the surface and 1,025 gallons per minute with water level drawn down to 68 feet below the surface. A pump of 850-gallons-per-minute capacity was on the well when I visited it 2 years ago. Though that observation may partially answer your question, it would probably be necessary to run pump tests to obtain the correctly designed pump for the greater yield you contemplate.

There is some interference, I understand, between your Main Street "younger" well and the Utah Canning Co. well 500± feet to the northeast. The logs of the wells are similar. The Utah Canning Co. well shows that the basalt contained water whose static level was only 15 feet below the surface until the zone at 468-528 feet depth was penetrated; at that time the static water level dropped to 41 feet from the surface. If such is the case in your well, some water may run from the higher strata down the well and out the lower zone. It is suggested that the amount of such change, if any in your well, should be determined as a matter of planning for a new pump. This office has a well-current meter with which we can measure interchange; if you will notify us when the well is to be clear of pumping equipment. Such an interchange measurement is of value as data applying to well construction over the entire Columbia River basalt area of Oregon and Washington.

I hope this information will answer some of your questions.

Sincerely yours,

R. C. Newcomb
District Geologist

RCN:rls
Enclosure - 1 log

CC: Mr. Chas. E. Stricklin

RECEIVED
JUL 8 1985
WATER RESOURCES DEPT
SALEM, OREGON

UMAT 5128

6N/35E-36b
(for official use only)

STATE OF OREGON
WATER WELL REPORT
(as required by ORS 537.765)

PLEASE TYPE or PRINT IN INK

(1) OWNER:
Name Fred Kaup
Address Rt #3 Box 154C
City Milton Freewater, OR State 97862

(2) TYPE OF WORK (check):
New Well ☑ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary Air ☑ Driven ☐
Rotary Mud ☐ Dug ☐
Cable ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☑ Municipal ☐
Irrigation ☐ Thermal: Withdrawal ☐ Reinjection ☐
Other: Piezometric ☐ Grounding ☐ Test ☐

(5) CASING INSTALLED: Steel ☐ Plastic ☐ Threaded ☐ Welded ☑
8" Diam. from +1 1/2 ft. to 58 1/2 ft. Gauge 0.250
" Diam. from ft. to ft. Gauge

LINER INSTALLED: Steel ☐ Plastic ☐ Threaded ☐ Welded ☐
" Diam. from ft. to ft. Gauge

(6) PERFORATIONS: Perforated? ☐ Yes ☑ No
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS: Well screen installed? ☐ Yes ☑ No
Manufacturer's Name
Type Model No.
Diam. Slot Size Set from ft. to ft.
Diam. Slot Size Set from ft. to ft.

(8) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? ☐ Yes ☐ No If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
Air test 500 gal./min. with drill stem at 85 ft. 1 hrs.
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water 58° Depth artesian flow encountered ft.

(9) CONSTRUCTION: Special standards: Yes ☐ No ☑
Well seal—Material used Cement
Well sealed from land surface to 30 ft.
Diameter of well bore to bottom of seal 12 in.
Diameter of well bore below seal 8 in.
Amount of sealing material 15 sacks ☑ pounds ☐
How was cement grout placed? Pumped

Was pump installed? No Type HP Depth ft.
Was a drive shoe used? ☑ Yes ☐ No Plugs Size: location ft.
Did any strata contain unusable water? ☐ Yes ☑ No
Type of Water? depth of strata
Method of sealing strata off
Was well gravel packed? ☐ Yes ☑ No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL by legal description:
County Umatilla NW NW 1/4 of Section 36 of
Township 6N (Township is North or South), Range 35 E (Range is East or West) WM.
Tax Lot Lot Block Subdivision
MAILING ADDRESS OF WELL (or nearest address) Same

(11) WATER LEVEL of COMPLETED WELL:
Depth at which water was first found 78 ft.
Static level 36 ft. below land surface. Date 5-30-85
Artesian pressure lbs. per square inch. Date

(12) WELL LOG: Diameter of well below casing 8
Depth drilled 102 ft. Depth of completed well 100 ft.
Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
Soil Gravel & Boulders	0	8	
Gravel & Boulders	8	22	
Clay Gravel & Boulders	22	55	
Cement Gravel	55	102	36

Date work started 5-21-85 /completed 5-30-85
Date well drilling machine moved off of well 5-30 1985

(unbonded) Water Well Constructor Certification (if applicable):
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] Date , 19

(bonded) Water Well Constructor Certification:
Bond (number) Issued by: (Surety Company Name)
On behalf of (type or print name of Water Well Constructor)

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
(Signed) Clarence W. Simmons (Water Well Constructor)
(Dated) 6-6-85

NOTICE TO WATER WELL CONSTRUCTOR
The original and first copy of this report are to be filed with the
WATER RESOURCES DEPARTMENT,
SALEM, OREGON 97310
within 30 days from the date of well completion.

SP*46866-690

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the
STATE ENGINEER, SALEM, OREGON 97310 within 30 days from the date of well completion.

RECEIVED
26 1968
STATE ENGINEER
SALEM, OREGON

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

UMAT 4008

State Well No. 5N/36-18
State Permit No.

(1) OWNER:
Name: Clyde Harris
Address: 1014 SW Goodwin Ave. Pendleton, Oregon

(2) TYPE OF WORK (check):
New Well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☐ Driven ☐
Cable ☒ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☒ Test Well ☐ Other ☐

(5) CASING INSTALLED: Threaded ☐ Welded ☒
10" Diam. from 0 ft. to 45 ft. Gage 250
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

(6) PERFORATIONS: Perforated? ☐ Yes ☒ No.
Type of perforator used
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS: Well screen installed? ☐ Yes ☒ No
Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(8) WATER LEVEL: Completed well.
Static level 47 ft. below land surface Date 1/25/68
Artesian pressure lbs. per square inch Date

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? ☒ Yes ☐ No If yes, by whom? Driller
Yield: 472 gal./min. with 2 ft. drawdown after 2 hrs.
" " " "
" " " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water 52 Was a chemical analysis made? ☐ Yes ☒ No

(10) CONSTRUCTION:
Well seal—Material used Puddled clay
Depth of seal 18' ft.
Diameter of well bore to bottom of seal 13 in.
Were any loose strata cemented off? ☐ Yes ☒ No Depth
Was a drive shoe used? ☒ Yes ☐ No
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? ☐ Yes ☒ No Size of gravel:
Gravel placed from ft. to ft.

(11) LOCATION OF WELL:
County Umatilla Driller's well number
¼ ¼ Section 18 T. 5 R. 36 E W.M.
Bearing and distance from section or subdivision corner

(12) WELL LOG: Diameter of well below casing 10" to 100' - 8" to 195'
Depth drilled 195 ft. Depth of completed well 195 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level as drilling proceeds. Note drilling rates.

MATERIAL	From	To	SWL
Gray clay	0	3	
Gray clay & coarse gravel	3	16	8'
Med. gravel	16	23	8'
Gray clay & coarse gravel	23	28	10'
Fine gravel	28	29	10'
Gray clay & med. gravel	29	44	7'
Big boulders	44	47	7'
Boulders & blue clay	47	72	47'
Broken boulders	72	79	47'
Fine gravel	79	81	47'
Hard boulders	81	100	47'
Fine gravel conglomerate	100	120	47'
Boulders	120	195	47'

Work started 11/1 1967 Completed 1/25 1968
Date well drilling machine moved off of well 1/28 1968

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] E M J Behrens (Drilling Machine Operator) Date 2/23, 1968

Drilling Machine Operator's License No. 124

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
NAME E. M. J. Behrens (Person, firm or corporation) (Type or print)
Address P.O. Box 201-Milton-Freewater, Oreg.
[Signed] E M J Behrens (Water Well Contractor)
Contractor's License No. 229 Date 2/23, 1968

(USE ADDITIONAL SHEETS IF NECESSARY)

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the
WATER RESOURCES DEPARTMENT,
SALEM, OREGON 97310
within 30 days from the date of well completion.

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

RECEIVED APR 20 1981 WATER RESOURCES DEPT SALEM, OREGON

PAGE #1.
State Well No. 6N 35E-36bc
State Permit No.
UMAT 6475

(1) OWNER:
Name Sam LeFore
Address Rt.1 Box 174 East side Rd.
Milton Freewater Oregon.

(2) TYPE OF WORK (check):
New Well X Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary X Driven ☐ Cable ☐ Jetted ☐ Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☐ Irrigation X Test Well ☐ Other ☐

(5) CASING INSTALLED: Threaded ☐ Welded X
10" Diam. from 0 ft. to 40 ft. Gage 0250
8" Diam. from 20 ft. to 240 ft. Gage SCH 160
" Diam. from ft. to ft. Gage

(6) PERFORATIONS: Perforated? X Yes ☐ No.
Type of perforator used Whole Saw
Size of perforations 1 in. by 1 in.
500 perforations from 100 ; ft. to 240 ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS: Well screen installed? ☐ Yes X No
Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(8) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? X Yes ☐ No If yes, by whom?
Yield: 450 gal./min. with 26 ft. drawdown after 4 hrs.
" " "
" " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water 54 Depth artesian flow encountered ft.

(9) CONSTRUCTION:
Well seal—Material used Cement
Well sealed from land surface to 28 ft.
Diameter of well bore to bottom of seal 12 in.
Diameter of well bore below seal 10 in.
Number of sacks of cement used in well seal 23 sacks
How was cement grout placed? pumped

Was a drive shoe used? X Yes ☐ No Plugs Size: location ft.
Did any strata contain unusable water? ☐ Yes X ☐ No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? ☐ Yes X No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:
County Umitilla Driller's well number
SW ¼ NW ¼ Section 36 T. 6 R. 35E W.M.
Bearing and distance from section or subdivision corner
Tax Lot 1400 Rt 1 B 174
East side Rd.

(11) WATER LEVEL: Completed well.
Depth at which water was first found 80 ft.
Static level 100 ft. below land surface. Date Jan 29-81
Artesian pressure lbs. per square inch. Date

(12) WELL LOG: Diameter of well below casing 10
Depth drilled 243 ft. Depth of completed well 240 ft.
Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
Brown loam top soil	0	23	
Tan clay and bolders			
loose and cavy	23	34	
Brown hard pan with 2"			
to4" rocks hard.	34	56	
Boulders 1 ft and larger			
in hard pan tan and brown			
in color.	56	68	
Yellow clay small gravel			
simi soft with a trace			
of sand in the clay.	68	79	
Blue clay muck	79	81	
Yellow sandy hard pan			
porus and waterbearing.	81	151	
Dark brown clay and gravel			
1"-3" Soft.	151	159	
Grey clay Soft	159	164	
Black basalt	164	184	
Blue clay	184	223	continue

Work started 1-26-81 19 Completed 1-29-81 19
Date well drilling machine moved off of well 1-29-81 19

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] (Drilling Machine Operator) Date 1-29-81 19
Drilling Machine Operator's License No. 1298

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name Goral LaPorte Well Drilling
(Person, firm or corporation) (Type or print)
Address Rt 1 Box 191 M-F Oregon
[Signed] (Water Well Contractor)
Contractor's License No. 756 Date 1-29-81 19

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-110

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the
WATER RESOURCES DEPARTMENT, SALEM, OREGON 97310 within 30 days from the date of well completion.

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WATER RESOURCES DEPT
SALEM, OREGON

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

Page # 2

State Well No. 6N/35E-36bc

State Permit No.

(1) OWNER:
Name Sam LeFore Page # 2
Address

(2) TYPE OF WORK (check):
New Well ☐ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☐ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(5) CASING INSTALLED:
Threaded ☐ Welded ☐
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

(6) PERFORATIONS:
Perforated? ☐ Yes ☐ No.
Type of perforator used
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS:
Well screen installed? ☐ Yes ☐ No
Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(8) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? ☐ Yes ☐ No If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " "
" " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water Depth artesian flow encountered ft.

(9) CONSTRUCTION:
Well seal—Material used
Well sealed from land surface to ft.
Diameter of well bore to bottom of seal in.
Diameter of well bore below seal in.
Number of sacks of cement used in well seal sacks
How was cement grout placed?

Was a drive shoe used? ☐ Yes ☐ No Plugs Size: location ft.
Did any strata contain unusable water? ☐ Yes ☐ No
Type of water? depth of strata
Method of sealing strata off
Was well gravel packed? ☐ Yes ☐ No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:
County Umitilla Driller's well number
SW ¼ NW ¼ Section 36 T. 6 R. 35E W.M.
Bearing and distance from section or subdivision corner
Tax Lot 1400 Rt 1 Box 174
East Side Rd

(11) WATER LEVEL: Completed well.
Depth at which water was first found ft.
Static level ft. below land surface. Date
Artesian pressure lbs. per square inch. Date

(12) WELL LOG:
Diameter of well below casing
Depth drilled ft. Depth of completed well ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
Continued from Page # 1.			
Broken Black basalt mixed with soft blue clay and small gravel	223	225	
Hard black basalt	225	226	
Broken black basalt with streaks of red and black cinder and lava rock in layers. Water bearing	226	233	
hard black basalt dense	233	235	
Brokem and very porus lava rock water bearing very cavy	235	243	

Work started 19 Completed 19
Date well drilling machine moved off of well 19

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] (signature) (Drilling Machine Operator) Date 1-29-81, 19
Drilling Machine Operator's License No. 1298

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name Goral M. LaPorte Well Drilling. (Person, firm or corporation) (Type or print)
Address Rt 1 Box 401 M.F. Oregon
[Signed] (signature) (Water Well Contractor)
Contractor's License No. 756 Date 1-29-81, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

STATE ENGINEER
Salem, Oregon

UMAT 5157

Well Record

STATE WELL NO. 6N/35-36B
COUNTY Umatilla
APPLICATION NO. GR-3844

OWNER: Oland F. Hubbs
Ebev. L. Hurst

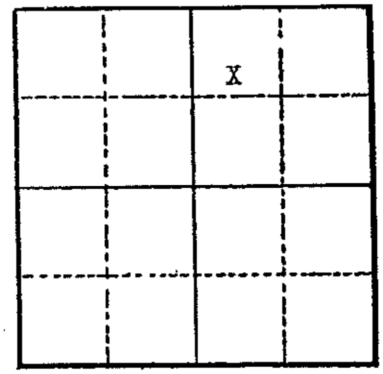
MAILING ADDRESS: Route 1, Box 39

CITY AND STATE: Milton-Freewater, Oregon

LOCATION OF WELL: Owner's No. ....

NW ¼ NE ¼ Sec. 36 T. 6 N. R. 35 E., W.M.

Bearing and distance from section or subdivision corner 660' E. & 1300' S. from N¼ Cor. Sec. 36



Section 36

Altitude at well ....

TYPE OF WELL: Dug 30' Drilled 228' Date Constructed 1914

Depth drilled 258 ft. Depth cased ....

CASING RECORD:

8 inch casing set from 30' to

FINISH:

Perforated

AQUIFERS:

WATER LEVEL:

12 feet below surface

PUMPING EQUIPMENT: Type Johnston turbine 5" H.P. 5
Capacity 450 G.P.M.

WELL TESTS:
Drawdown about 60 ft. after .... hours 450 G.P.M.
Drawdown .... ft. after .... hours .... G.P.M.

USE OF WATER Irrigation Temp. .... °F. ...., 19......
SOURCE OF INFORMATION Well Registration Statement Cert. #GR-3501
DRILLER or DIGGER ....
ADDITIONAL DATA:
Log .... Water Level Measurements .... Chemical Analysis .... Aquifer Test ....

REMARKS:

State Printing 89316

STATE ENGINEER
Salem, Oregon

UMAT
6

Well Record

GR- 1630

STATE WELL NO. 6N/35-36K
COUNTY Umatilla
APPLICATION NO. GR- 1596

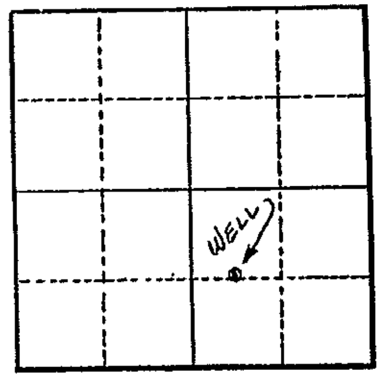
OWNER: Willa M. Arnoldt
MAILING ADDRESS: Rt. 1, Box 167

LOCATION OF WELL: Owner's No. ......
CITY AND STATE: Milton-Freewater, Oregon

NW 1/4 SE 1/4 Sec. 36 T. 6 ~~S~~ N., R. 35 ~~W~~ E., W.M.

Bearing and distance from section or subdivision corner 60' N. & 705' W. from SE cor. of NW¼SE¼ of Section 36.

Altitude at well 950'



Section 36

TYPE OF WELL: Dug&Drill'd Date Constructed 1920-Prior to

Depth drilled 90' Depth cased 51'

CASING RECORD:
72" x 84" concrete curbing from 0 to 20 ft.
8" steel from 36 to 51 ft.

FINISH:

AQUIFERS:

WATER LEVEL:
15'

PUMPING EQUIPMENT: Type 4" turbine H.P. 5
Capacity 400 G.P.M.

WELL TESTS:
Drawdown 15 ft. after ...... hours 400 G.P.M.
Drawdown ...... ft. after ...... hours ...... G.P.M.

USE OF WATER Irrigation Temp. ...... °F. ......, 19......
SOURCE OF INFORMATION GR Record
DRILLER or DIGGER
ADDITIONAL DATA:
Log ...... Water Level Measurements ...... Chemical Analysis ...... Aquifer Test ......

REMARKS:

Log:	Top soil	0 to 2 ft.
	Cement gravel	2 to 90 ft.

Irrigation of 10 acres.

STATE ENGINEER
Salem, Oregon

UMAT 3915

Well Record

GR- 1451

STATE WELL NO. 5N/35-1F
COUNTY Umatilla
APPLICATION NO. GR- 1411

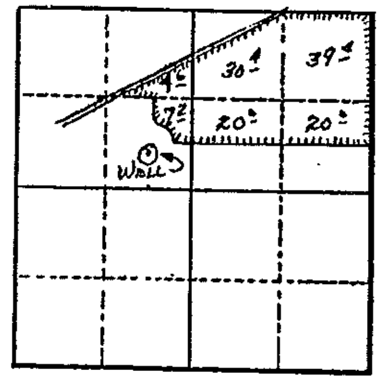
OWNER: Milton Nursery Company
MAILING ADDRESS: P. O. Box 1305

LOCATION OF WELL: Owner's No. ______
CITY AND STATE: Milton-Freewater, Oregon

SE ¼ NW ¼ Sec. 1 T. 5 N., R. 35 E., W.M.

Bearing and distance from section or subdivision corner 620' E. & 496' N. from SW cor. of SE¼NW¼ of Section 1.

Altitude at well 1000'



Section 1

TYPE OF WELL: Dug Date Constructed 1925
Depth drilled 30' Depth cased 10'

CASING RECORD:
6' x 6' cement curb

FINISH:

AQUIFERS:
Gravel

WATER LEVEL:
10'

PUMPING EQUIPMENT: Type Byron-Jackson 8" x 8" Cent. H.P. 20
Capacity 400 G.P.M.

WELL TESTS:
Drawdown 20 ft. after ______ hours 400 G.P.M.
Drawdown ______ ft. after ______ hours ______ G.P.M.

USE OF WATER Irrigation Temp. ______ °F. ______, 19___
SOURCE OF INFORMATION GR Record
DRILLER or DIGGER ______
ADDITIONAL DATA:
Log ______ Water Level Measurements ______ Chemical Analysis ______ Aquifer Test ______

REMARKS:
Log: Gravel formation 0 to 30 ft.

Irrigation of 121.6 acres.

UMAT 50069

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WATER RESOURCES DEPT.
SALEM, OREGON

STATE OF OREGON
WATER WELL REPORT
(as required by ORS 537.765)
Instructions for completing this report are on the last page of this form.

(START CARD) # ~~W-67913~~

(1) OWNER: Well Number
Name MILTON FREEWATER CEM. DIST.
Address P O BOX ~~277~~ 218
City Milton Freewater State Or Zip 97862

(2) TYPE OF WORK
[x] New Well [ ] Deepening [ ] Alteration (repair/recondition) [ ] Abandonment

(3) DRILL METHOD:
[x] Rotary Air [ ] Rotary Mud [ ] Cable [ ] Auger
[ ] Other

(4) PROPOSED USE:
[ ] Domestic [ ] Community [ ] Industrial [x] Irrigation
[ ] Thermal [ ] Injection [ ] Livestock [ ] Other

(5) BORE HOLE CONSTRUCTION:
Special Construction approval [ ] Yes [x] No Depth of Completed Well 706 ft.
Explosives used [ ] Yes [x] No Type Amount

HOLE Diameter	From	To	SEAL Material	From	To	Sacks or pounds
12	368	0	ptd cem	0	90	60 sacks
8	368	630	ptd cem	262	368	58 sacks
6	630	706				

How was seal placed: Method [ ] A [ ] B [ ] C [ ] D [ ] E
[ ] Other tremmepipe
Backfill placed from 90 ft. to 262 ft. Material formation cave in
Gravel placed from ft. to ft. Size of gravel

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	8	+2	368	.25	[x]	[ ]	[x]	[ ]
					[ ]	[ ]	[ ]	[ ]
					[ ]	[ ]	[ ]	[ ]
					[ ]	[ ]	[ ]	[ ]
Liner:	6	360	630	.25	[x]	[ ]	[x]	[ ]
					[ ]	[ ]	[ ]	[ ]

Final location of shoe(s) 6" @360 & 630

(7) PERFORATIONS/SCREENS:
[x] Perforations Method rotary perforator
[ ] Screens Type Material

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
400	620		3500			[ ]	[ ]
						[ ]	[ ]
						[ ]	[ ]
						[ ]	[ ]
						[ ]	[ ]

(8) WELL TESTS: Minimum testing time is 1 hour

[ ] Pump [ ] Bailer [x] Air [ ] Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
150		300	1 hr.

Temperature of water 68 Depth Artesian Flow Found
Was a water analysis done? [ ] Yes By whom
Did any strata contain water not suitable for intended use? [ ] Too little
[ ] Salty [ ] Muddy [ ] Odor [ ] Colored [ ] Other
Depth of strata:

(9) LOCATION OF WELL by legal description:
County Umatilla Latitude Longitude
Township 5n N or S Range 35e E or W. WM.
Section 12 ne 1/4 ne 1/4
Tax Lot Lot Block Subdivision
Street Address of Well (or nearest address)

(10) STATIC WATER LEVEL:
356 ft. below land surface. 2/11/96 Date 2/11/96
Artesian pressure lb. per square inch. Date

(11) WATER BEARING ZONES:

Depth at which water was first found 385

From	To	Estimated Flow Rate	SWL
385	389	18	356
413 ~~438~~	438	75	356
441	523	150	356
612	630	possible h20	

(12) WELL LOG:
Ground Elevation

Material	From	To	SWL
see attached sheet			

Date started Completed 2-11-96

(unbonded) Water Well Constructor Certification:
I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.
WWC Number 1683
Signed TONY BOWMEN Date 2-11-96

(bonded) Water Well Constructor Certification:
I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.
WWC Number 544
Signed Gay Bund Date 2-11-96

ORIGINAL & FIRST COPY-WATER RESOURCES DEPARTMENT SECOND COPY-CONSTRUCTOR THIRD COPY-CUSTOMER

DATE	FROM	TO	FORMATION	COMMENTS	SWL	GPM
Jul 13, 1995	0	11	SOIL			
	11	21	1' GRAVEL			
	21	46	BROWN CLAY			
	46	56	2" ROCK & BROWN CLAY			
	56	61	RED & BROWN CLAY			
Jul 20, 1995	61	116	BROWN CLAY & GRAVEL	CAVED IN TO 110		
				83' OF 12" CASING		
Jul 24, 1995	116	120	GRAY CLAY & GRAVEL	STANDING OPEN TO 122'		
Jul 25, 1995	120	126	BROWN CLAY & GRAVEL			
Jul 25, 1995	126	130	BLACK BASALT			
Jul 31, 1995	130	145	BLACK BASALT			
	145	152	BROWN BASALT	SOFT		
	152	187	BROKEN BROWN BASALT			
	187	197	BLACK BASALT	SCORIA		
	197	222	BLACK BASALT			
	222	240	BROWN BASALT			
	240	250	BLACK BASALT			
8/1-8/3				REPAIR RIG		
Aug 4, 1995	250	280	BLACK BASALT	SOFT		
Aug 7, 1995	280	315	BLACK BASALT	SOFT		
	POSSIBLE PROBLEM @ 207					
	315	349	GRAY BASALT			
Aug 8, 1995	349	355	BROWN BASALT	SOFT	346	
Aug 14, 199	355	368	BLACK BASALT	CEMENT IN 8" FROM 262 TO 368		
	READY MIX M 22074					
	368	372	BLACK BASALT			
	372	376	BLACK BASALT	SCORIA		
Aug 16, 199	376	385	BLACK BASALT			
	385	389	BLACK BASALT	BROKEN		
	389	404	BLACK BASALT			18
	404	408	RED BASALT	SOFT		
	408	413	BLACK SCORIA & GREEN CLAY STONE			
	413	424	BLACK BASALT			35
	424	438	BLACK BASALT	CAVING	68 F.	75
	438	441	BLACK BASALT			
	441	479	BLACK BASALT	BROKEN, CAVING		H20
	479	523	BLACK BASALT			H20
Aug 17, 199	BRIDGE 381' TO 390', OPEN BELOW					
CEMENT FROM 390' TO VARIOUS LEVELS, 8 TIMES						
Jan 21, 199	523	594	BLACK BASALT			
	594	598	BLACK BASALT			
	598	612	BLACK	HARD		
	612	616	BLACK	SOFT	POSSIBLE H20	
	616	630	BLACK	HARD		
	630	690	BLACK	BROKEN	POSSIBLE H20	
	690	706	BLACK			

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WATER RESOURCES DEPT
SALEM, OREGON

File Original and First Copy with the STATE ENGINEER, SALEM, OREGON

WATER WELL REPORT
STATE OF OREGON

UMAT 4017

State Well No. 5N/36-18

State Permit No.

(1) OWNER:

Name Dick Frye

Address Route 1 - Box 39D
Milton-Freewater, Oregon

(2) LOCATION OF WELL:

County Umatilla Owner's number, if any—

¼ ¼ Section 18 T. 5N R. 36 E W.M.

Bearing and distance from section or subdivision corner

(3) TYPE OF WORK (check):

New Well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐

If abandonment, describe material and procedure in Item 11.

(4) PROPOSED USE (check):

Domestic ☒ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(5) TYPE OF WELL:

Rotary ☐ Driven ☐
Cable ☒ Jetted ☐
Dug ☐ Bored ☐

(6) CASING INSTALLED: Threaded ☐ Welded ☒

6" Diam. from 0 ft. to 26 ft. Gage 288
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

(7) PERFORATIONS: Perforated? ☐ Yes ☒ No

Type of perforator used

SIZE of perforations in. by in.

perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(8) SCREENS: Well screen installed ☐ Yes ☒ No

Manufacturer's Name

Type Model No.

Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(9) CONSTRUCTION:

Was well gravel packed? ☐ Yes ☒ No Size of gravel:

Gravel placed from ft. to ft.

Was a surface seal provided? ☐ Yes ☐ No To what depth? ft.

Material used in seal—

Did any strata contain unusable water? ☐ Yes ☒ No

Type of water? Depth of strata

Method of sealing strata off

(10) WATER LEVELS:

Static level 10 ft. below land surface Date 2/20/61

Artesian pressure lbs. per square inch Date

Log Accepted by:

[Signed] Dick Frye (Owner) Date 3-19, 1961

(11) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☒ No If yes, by whom?

Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "

Bailer test gal./min. with ft. drawdown after hrs.

Artesian flow g.p.m. Date

Temperature of water 45 Was a chemical analysis made? ☐ Yes ☒ No

(12) WELL LOG: Diameter of well inches.

Depth drilled ft. Depth of completed well ft.

Formation: *Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.*

MATERIAL	FROM	TO
Boulders	0	13
Concrete rock	13	16
Gravel	16	23
Concrete rock	23	42

Work started 2/16 1961 Completed 2/20 1961

(13) PUMP:

Manufacturer's Name

Type: H.P.

Well Driller's Statement:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME E.M.J. Behrens (Person, firm, or corporation) (Type or print)

Address P.O. Box 201-Milton-Freewater, Oreg.

Driller's well number

[Signed] EMJ Behrens (Well Driller)

License No. 229 Date 3-19, 1961

(USE ADDITIONAL SHEETS IF NECESSARY)

RECEIVED

9-159
(Oct. 1930)

DEC 19 1963

NOTEBOOK SHEET 5N/36-18M(1)

Name Newcomb, Sceva, & Turner Date Dec. 17, 1963

Current-metering deep wells near Milton + Freewater

Milton-Freewater No. 7 (5/36-18N1 or M1)

	Depth (ft below land surface)	Clicks/min	Vel (ft sec)	Flow (gpm) (downward)
Traverse down	242 (turbulent)	20(?)	.35(?)	
	400	6½	.07	24.5
	500	5	.05	17.5
	600	0		
	700	0		
	800	7	.075	26.3
	850	0		
Traverse up	700	0		
	600	0		
	500	0		
	400	6½	.07	24.5
	300	0		

Hole dia. is 12" ID. casing 0-190 ft., 12" bare rock hole 190-888? ft.
Static water level 241 ft below top of 12" casing which is 2 ft above land surface, Dec. 17, 1963. Estimated 25 gpm cascading into well around bottom of 12" casing at 190 ft.

Conclusion: No movement of water in well except 25 gpm descending from 190 to 852+ ft. At most points velocity insufficient to turn meter.

U. S. GOVERNMENT PRINTING OFFICE 16—12485-1

5N/35-12G(1)

LOG OF MATERIALS ENCOUNTERED

Character of Material	Depth at which encountered	Thickness of stratum
Gravel	At surface	21 ft.
Cement Gravel	21 ft.	to 47 ft.
Rock	47 ft.	to 50 ft.
Black Basalt	50 ft.	to 57 ft.
Gray Basalt	57 ft.	to 65 ft.
Black Basalt	65 ft.	to 132 ft.
Brown Basalt	132 ft.	to 167 ft.
Black Basalt	167 ft.	to 182 ft.
Brown & Black Basalt Honeycombed	182 ft.	to 185 ft.
Black Basalt	185 ft.	to 203 ft.
Brown & Black Basalt	203 ft.	to 255 ft.
Black Basalt	255 ft.	to 395 ft.
Gray Basalt	395 ft.	to 401 ft.
Black Basalt	401 ft.	to 508 ft.
Gray Basalt	508 ft.	to 521 ft.
Black Basalt	521 ft.	to 536 ft.
Gray Basalt	536 ft.	to 569 ft.
Black Basalt Honeycombed	569 ft.	to 584 ft.
Black Basalt	584 ft.	to 622 ft.
Gray Basalt	622 ft.	to 639 ft.
Black Basalt	639 ft.	to 702 ft 6"

APPENDIX G

Walla Walla River Water Quality Data

Environmental Information : River & Stream Water Quality Monitoring

AMBIENT MONITORING DATA

Station 32A070
Six Year Water Quality Data Summary

Last updated 11-Apr-2001

Station name	Class	Latitude	Longitude	Elevation (ft)	River mile	Watershed(s)	External mapping links	
Walla Walla R nr Touchet	B	46 02 16.0	118 45 55.0	370	15.3	Lower Snake	Tiger Mapping Service	TopoZone®

Years-monitored history *Note: Data for years not presented here are available on request. See Requesting additional data.*

2001	2000	99	98	97	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64	63	62	61	60	59
	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•					•	•	•	•	•	•	•	•

2000 (32A070)	Time	Temperature (C)	Flow (CFS)	Conductivity (umhos/ 25c)	Oxygen (mg/L)	Oxygen Saturation (%)	pH	Suspended Solids (mg/L)	Total Persulfate Nitrogen (mg/L)	Ammonia Nitrogen (mg/L)	Total Phosphorus (mg/L)	Dissolved Soluble Phosphorus (mg/L)	Turbidity (NTU)	Fecal Coliforms (colonies/ 100ml)	Nitrate-Nitrite (mg/L)
09/13/00	0615	18.9		201	7.8	84.2	7.4	23	0.474	0.010u	0.134	0.086	9.5	92	0.4
08/09/00	1115	22.3		466	10.8	127.2	8.4	5	1.200	0.025	0.119	0.081	3.8	28	0.9
07/12/00	0730	19.4		278	7.4	81.1	8.1	13	0.595	0.010	0.091	0.049	6.5	80	0.4
06/14/00	1105	15.2		107	8.2	82.5	7.1	63	0.578	0.020	0.147	0.065	29	260	0.4
05/10/00	0830	11.3		174	9.6	89.6	7.3	39	0.607	0.018	0.097	0.048	15	230	0.4
04/12/00	0805	11.6		114	9.3	86.4	8.0	42	0.679	0.010u	0.104	0.050	8.6	45	0.5
03/15/00	0945	5.7		106	11.7	92.8	7.7	100	1.150	0.012	0.163	0.078	32	43	1.0
02/08/00	1435	3.7		93	12.5	95.9	8.1	52	0.906	0.023	0.184	0.069	22	60	0.7
01/12/00	1230	2.1		114	12.8	94.2	7.4	16	0.974	0.039	0.127	0.080	11	27	0.8

result fails water quality criteria Data qualifiers: u, j - estimated value k - actual value known to be less s - spreader x - high background count

1999 (32A070)	Time	Temperature (C)	Flow (CFS)	Conductivity (umhos/25c)	Oxygen (mg/L)	Oxygen Saturation (%)	pH	Suspended Solids (mg/L)	Total Persulfate Nitrogen (mg/L)	Ammonia Nitrogen (mg/L)	Total Phosphorus (mg/L)	Dissolved Soluble Phosphorus (mg/L)	Turbidity (NTU)	Fecal Coliforms (colonies/100ml)	Nitrate-Nitrite (mg/L)
12/15/99	1125	4.3		118	12.3	95.4	7.3	37	0.723	0.041	0.134	0.078	14	130	0.6
11/17/99	0920	7.3		235	10.5	88.8	7.3	7	0.496	0.010u	0.098	0.055	4.6	25	0.4
10/13/99	1005	10.8		264	10.2	92.7	8.0	19	0.587	0.010u	0.130	0.060	7.3	28	0.3
09/07/99	1745	18.0	25	309	12.6	134.1	8.6	18	0.732	0.047	0.142	0.072	8.7	27	0.5
08/03/99	1700	25.2	11	407	14.3	175.5	9.0	33	0.885	0.043	0.121	0.022	15	64	0.1
07/06/99	1600	24.0	65	230	12.6	152.3	9.0	18	0.572	0.039	0.117	0.040	7.4	77	0.2
06/15/99	1730	25.3	227	176	9.1	113.0	8.2	17	0.770	0.057	0.149	0.065	8.1	380	0.5
05/12/99	0805	9.7	623	120	10.0	88.7	8.3	29	0.604	0.031	0.091	0.028	8.2	80	0.3
04/14/99	1045	8.9	762	402	11.3	96.4	8.1	25	0.733	0.023	0.119	0.059	10	28	0.5
03/17/99	0945	5.6	1100	103	11.9	95.9	7.4	134	0.906	0.027	0.164	0.087	34	80	0.8
02/02/99	1730	3.4	688	117	12.3	94.2	8.0	95	1.340	0.023	0.217	0.092	28	150	1.2
01/13/99	1005	4.0	704	138	11.8	90.5	7.4	46	1.040	0.038	0.129	0.086	16	39	0.9

▨ *result fails water quality criteria* Data qualifiers: u, j - estimated value k - actual value known to be less s - spreader x - high background count

1998 (32A070)	Time	Temperature (C)	Flow (CFS)	Conductivity (umhos/25c)	Oxygen (mg/L)	Oxygen Saturation (%)	pH	Suspended Solids (mg/L)	Total Persulfate Nitrogen (mg/L)	Ammonia Nitrogen (mg/L)	Total Phosphorus (mg/L)	Dissolved Soluble Phosphorus (mg/L)	Turbidity (NTU)	Fecal Coliforms (colonies/100ml)	Nitrate-Nitrite (mg/L)
12/16/98	0820	3.4	1060	103	12.2	90.9	7.2	69	1.040	0.033	0.139	0.067	32	77	0.7
11/03/98	1750	7.6	58	237	12.9	108.1	8.6	16	0.584	0.010u	0.056	0.027	14	28	0.3
10/14/98	0940	10.8	35	268	10.8	98.7	7.8	15	0.574	0.190	0.028	0.033	9.6	40	0.4
09/13/98	1745	22.9	37	376	12.0	142.4	8.5	36	0.858	0.010u	0.115	0.061	24	140	0.3
08/02/98	1715	26.2	32	348	11.5	144.1	8.8	27	0.921	0.010u	0.130	0.083	15	250	0.5
07/05/98	1535	23.8	48	373	12.6	150.3	8.8	28	0.865	0.010u	0.110	0.035	14	1500	0.4
06/07/98	1805	18.9	373	180	9.0	98.3	8.4	35	0.767	0.010u	0.116	0.050	15	140	0.6
05/03/98	1640	16.9	669	109	9.7	102.2	7.9	68j	0.831	0.024	0.114	0.050	23	88	0.5

04/13/98	1530	9.1	448	170	11.4	100.8	8.2	19	0.879	0.010u	0.094	0.053	11	49	0.8
03/01/98	1825	5.5	793	141	11.9	95.4	8.1	26	1.190	0.010u	0.087	0.052	12	42	1.2
02/01/98	1650	3.8	1150	113	12.1	94.5	7.9	60	1.060	0.010	0.105	0.054	22	25	0.9
01/04/98	1500	2.2	655	143	12.6	93.0	7.7	34	1.100	0.010u	0.169	0.060	16	27	0.9

result fails water quality criteria Data qualifiers: u, j - estimated value k - actual value known to be less s - spreader x - high background count

1997 (32A070)	Time	Tem-perature (C)	Flow (CFS)	Conduc-tivity (umhos/ 25c)	Oxygen (mg/L)	Oxygen Satura-tion (%)	pH	Sus-pended Solids (mg/L)	Total Persulfate Nitrogen (mg/L)	Ammonia Nitrogen (mg/L)	Total Phosphorus (mg/L)	Dissolved Soluble Phosphorus (mg/L)	Turbi-dity (NTU)	Fecal Coliforms (colonies/ 100ml)	Nitrate-Nitrite (mg/L)
12/07/97	1810	2.1	371	196	12.2	91.4	8.0	10	1.510	0.025	0.110	0.078	5	28	1.5
11/02/97	1930	7.9	280	182	11.2	94.9	7.9	26	1.310	0.048	0.164	0.073	23	160	1.1
10/05/97	1540	14.2	112	331	12.4	121.3	8.5	16	0.967	0.010u	0.146	0.063	7.1	31	0.7
09/08/97	0745	16.6	74	354	7.8	80.0	7.9	32	0.966	0.019	0.144	0.063	15	43	0.8
08/04/97	0705	23.8	55	370	6.5	76.5	8.0	17	0.924	0.010u	0.107	0.049	8.8	210	0.7
07/07/97	0730	20.3	155	309	7.7	85.2	7.9	39	1.330	0.036	0.115	0.041	15	92	1.0
06/02/97	0750	14.6	890	96	8.9	88.1	7.4	1720	1.850	0.090	0.178j	0.070	2700j	2900	1.0
05/05/97	0705	13.1	1650	119	9.9	94.0	7.6	206	1.200	0.025	0.273	0.050	50	120	1.0
04/07/97	0710	8.9	950	176	11.2	96.9	7.4	101	2.370	0.010u	0.440	0.059	20	14	2.1
03/03/97	0745	4.9	1610	127	12.0	94.3	7.6	626	2.440	0.027	0.433	0.073	400	240	1.8
02/03/97	0715	4.5	4050	80	12.2	94.0	7.6	2990	1.600	0.060	0.579j	0.060	800	69	1.3
01/13/97	0705	-0.2	1290	176j	13.5	91.4	6.9	163	2.110	0.038	0.218	0.063	40	45	1.9

result fails water quality criteria Data qualifiers: u, j - estimated value k - actual value known to be less s - spreader x - high background count

1996 (32A070)	Time	Tem-perature (C)	Flow (CFS)	Conduc-tivity (umhos/ 25c)	Oxygen (mg/L)	Oxygen Satura-tion (%)	pH	Sus-pended Solids (mg/L)	Total Persulfate Nitrogen (mg/L)	Ammonia Nitrogen (mg/L)	Total Phosphorus (mg/L)	Dissolved Soluble Phosphorus (mg/L)	Turbi-dity (NTU)	Fecal Coliforms (colonies/ 100ml)	Nitrate-Nitrite (mg/L)
12/02/96	0730	4.5	1210	118j	12.3	95.4	7.7	113	1.160j	0.034	0.164j	0.060	50	630j	0.7
11/04/96	0720	6.4	191	245	11.5	93.9	8.0	18	1.180	0.010u	0.097	0.051	11	37	1.1
10/07/96	0740	14.8	36	354	9.3	91.3	8.5	20	1.060	0.010u	0.119	0.050	14	110	0.6

09/08/96	1950	20.5	30	449	11.9	133.1	9.0	58	0.867	0.010u	0.124	0.016	27	280	0.4
08/11/96	1905	24.0	22	485	15.4	183.7	9.2	47	0.704	0.012	0.106	0.012	15	80	
07/16/96	1320	22.3	56	504	10.0	116.6	8.4	29	1.210	0.013	0.092	0.024	14	89s	0.5
06/09/96	2140	21.0	256	263	9.7	109.0	9.2	35	0.959	0.012	0.069	0.018	11	33	0.7
05/12/96	2040	15.3	591	211	9.6	96.3	8.0	46	1.980	0.010u	0.104	0.053	18	84s	1.9
04/16/96	1630	13.8	875	173	10.1	100.2	8.2	51	1.680	0.010u	0.068	0.043	15	110	1.5
03/12/96	1730	9.9	2690	103	14.1	126.0	7.6	9200j	3.480	0.268	0.223j	0.086	9500j		1.3
01/15/96	1820	8.1	1150	113	11.2	96.2	8.0	131	0.962	0.033	0.176	0.060	35	100	0.7

result fails water quality criteria   Data qualifiers: u, j - estimated value k - actual value known to be less s - spreader x - high background count

1995 (32A070)	Time	Temperature (C)	Flow (CFS)	Conductivity (umhos/ 25c)	Oxygen (mg/L)	Oxygen Saturation (%)	pH	Suspended Solids (mg/L)	Total Persulfate Nitrogen (mg/L)	Ammonia Nitrogen (mg/L)	Total Phosphorus (mg/L)	Dissolved Soluble Phosphorus (mg/L)	Turbidity (NTU)	Fecal Coliforms (colonies/ 100ml)	Nitrate-Nitrite (mg/L)
11/14/95	1335	12.0	302	101	10.9	100.2	7.9	122	0.865	0.020	0.207	0.062	60	150s	0.5
10/10/95	1455	12.8	58	267	9.7	92.7	7.9	105	1.210	0.053	0.048	0.106	120		0.8
09/11/95	1150	21.1	11	353	8.3	92.0	8.1	32	0.733	0.018	0.210	0.069	11	51	0.3
08/14/95	1245	20.4	29	500	9.4	103.8	8.3	14	0.889	0.026	0.190	0.088	4.5	23	0.6
07/10/95	1550	24.7	90	273	8.9	107.5	8.1	35	1.020	0.025	0.165	0.076	27	210	0.5
06/12/95	1400	22.1	158	210	11.2	128.1	8.9	14	0.645	0.022	0.080	0.033	5.5	96	0.2
05/08/95	1440	11.6	1700	104	10.3	96.0	7.9	211	0.676	0.010u	0.176	0.044	65	250	0.5
04/10/95	1335	9.3	989	112	11.1	97.2	8.0	125	1.070	0.026	0.145	0.054	35	220	0.8
03/12/95	1650	9.2	1820	91	11.1	97.6	7.6	409	0.964	0.010u	0.414	0.054	150	140	0.8
02/13/95	1540	3.2	989	167	13.5	102.2	7.6	77	1.260	0.036	0.142	0.059	23	53	1.2
01/02/95	1535	0.6	732	112	13.9	95.9	7.6	34	0.990	0.031	0.098	0.066	12	63	0.9

result fails water quality criteria   Data qualifiers: u, j - estimated value k - actual value known to be less s - spreader x - high background count

1994 (32A070)	Time	Temperature (C)	Flow (CFS)	Conductivity (umhos/ 25c)	Oxygen (mg/L)	Oxygen Saturation (%)	pH	Suspended Solids (mg/L)	Total Persulfate Nitrogen (mg/L)	Ammonia Nitrogen (mg/L)	Total Phosphorus (mg/L)	Dissolved Soluble Phosphorus (mg/L)	Turbidity (NTU)	Fecal Coliforms (colonies/ 100ml)	Nitrate-Nitrite (mg/L)

12/12/94	1440	2.0	460	138	12.7	92.8	7.6	22	1.184	0.049	0.113	0.091	12	36	0.9
11/20/94	1500	3.7	293	160	12.4	94.1	8.0	17	1.234	0.015	0.100	0.074	11	34	0.9
10/03/94	1620	15.1	7.7	747	11.5	115.1	8.5	10	1.340	0.018	0.055	0.010k	6	66	1.0
09/12/94	1330	17.4	2.1	757	11.5	120.7	8.7	6	0.668	0.036	0.038	0.018	4.7	32	0.3
08/08/94	1810	23.9	3.5	726	10.9	131.2	8.9	15	0.914	0.021	0.088	0.034	8.9	24	0.6
07/11/94	1545	26.9	12	456	9.9	124.8	8.2	24	1.100	0.045	0.159	0.072	17	89	0.7
06/13/94	1320	19.9	46	285	10.4	116.1	8.4	24	0.569	0.010k	0.079	0.052	10	200	0.4
05/09/94	1420	21.4	228	159	8.8	100.3	8.2	31	0.637	0.040	0.119	0.087	11	120	0.4
04/11/94	1640	11.5	566	118	11.1	102.1	8.1	34	0.633	0.010k	0.117	0.060	11	120	0.4
03/14/94	1420	8.1	566	135	11.2	95.6	7.9	88	1.040	0.024	0.155	0.078	22	48	0.8
02/14/94	1615	5.0	288	185	12.6	99.3	7.9	19	1.370	0.016	0.121	0.093	7.6	8	1.1
01/09/94	1555	5.8	835	122	11.6	93.4	7.8	112	1.140	0.067	0.158	0.076	46	71	0.8

result fails water quality criteria Data qualifiers: u, j - estimated value k - actual value known to be less s - spreader x - high background count

1993 (32A070)	Time	Temperature (C)	Flow (CFS)	Conductivity (umhos/25c)	Oxygen (mg/L)	Oxygen Saturation (%)	pH	Suspended Solids (mg/L)	Total Persulfate Nitrogen (mg/L)	Ammonia Nitrogen (mg/L)	Total Phosphorus (mg/L)	Dissolved Soluble Phosphorus (mg/L)	Turbidity (NTU)	Fecal Coliforms (colonies/100ml)	Nitrate-Nitrite (mg/L)
12/13/93	1640	4.4	268	171	11.9	93.3	8.1	26	1.230	0.035	0.139	0.110j	12		1.0
11/07/93	1555	4.9	61	254	14.1	110.8	8.4	8	0.686	0.011	0.062	0.041	5.4	8	0.5
10/11/93	1430	13.9	24	346	11.5	112.0	8.4	48	1.050	0.030	0.096	0.065	15	72	0.8
09/06/93	1320	22.4	21	425	9.6	111.2	8.6	33		0.018	0.120	0.072	21	68	0.5
08/02/93	1315	23.6	39	340	9.8	115.5	8.5	24		0.010k	0.101	0.072	4.7	54	0.3
07/05/93	1330	20.8	57	286	10.4	116.7	8.4	26		0.021	0.077	0.048	7	140	0.4
06/07/93	1340	18.1	398	178	10.1	107.2	8.0	94		0.057	0.127	0.081	21	270	0.7
05/03/93	1405	9.8	1950	85	10.7	95.7	7.7	356		0.068	0.232	0.051	40	230x	0.4
04/05/93	1255	6.8	1950	80	11.4	94.2	8.1	480		0.017	0.184	0.056	50	200	0.5
03/01/93	1310	1.2	382	161	14.0	98.6	8.2	16		0.021	0.099	0.081	5.7	1	1.2

02/01/93	1315	4.5	755	133	12.4	95.0	8.2	129		0.063	0.174	0.085	30	96	1.2

result fails water quality criteria Data qualifiers: u, j - estimated value k - actual value known to be less s - spreader x - high background count

1992 (32A070)	Time	Temperature (C)	Flow (CFS)	Conductivity (umhos/25c)	Oxygen (mg/L)	Oxygen Saturation (%)	pH	Suspended Solids (mg/L)	Total Persulfate Nitrogen (mg/L)	Ammonia Nitrogen (mg/L)	Total Phosphorus (mg/L)	Dissolved Soluble Phosphorus (mg/L)	Turbidity (NTU)	Fecal Coliforms (colonies/100ml)	Nitrate-Nitrite (mg/L)
12/01/92	1300	3.6	403	155	12.6	94.8	7.8	43		0.043	0.152	0.105	16	38	0.8
11/02/92	1315	10.3	78	214	10.5	93.1	7.9	72		0.024	0.016	0.056	29	150	0.2
10/05/92	1300	14.1	11	287	8.9	86.2	8.0	80		0.063	0.188	0.126	50	480	0.9

result fails water quality criteria Data qualifiers: u, j - estimated value k - actual value known to be less s - spreader x - high background count

Washington State Department of Ecology
Please send comments to stba461@ecy.wa.gov

WASHINGTON STATE
DEPT. OF ECOLOGY

' Conditions & Trends / River and Stream WQ Monitoring

: Station 32A070

AMBIENT MONITORING DATA

Station 32A070
Water Quality Data Summary - Metals

Last updated 28-May-1998

1997 (32A070)	Mercury (micrograms/ Liter)	Cadmium (micrograms/ Liter)	Zinc (micrograms/ Liter)	Lead (micrograms/ Liter)	Chromium (micrograms/ Liter)	Copper (micrograms/ Liter)	Nickel (micrograms/ Liter)	Hardness** (milligrams/ Liter)
08/04/1997		0.020u	0.580	0.060		1.570	1.250	150
06/02/1997		0.020u	0.660	0.150		1.140	0.824	95
04/07/1997		0.020u	0.950	1.380		1.120	0.650	68
02/03/1997		0.030u	1.000	0.200		0.795	0.390	100
			*Data qualifiers: u, j - estimated value k - actual value known to be less p - too numerous to count v - contamination in the blankt x - high background count					
1996 (32A070)	Mercury (micrograms/ Liter)	Cadmium (micrograms/ Liter)	Zinc (micrograms/ Liter)	Lead (micrograms/ Liter)	Chromium (micrograms/ Liter)	Copper (micrograms/ Liter)	Nickel (micrograms/ Liter)	Hardness** (milligrams/ Liter)
12/02/1996		0.014	1.000	0.030u		0.560	0.340	49
10/07/1996		0.027	1.400j	0.101		1.270	1.040	138
			*Data qualifiers: u, j - estimated value k - actual value known to be less p - too numerous to count v - contamination in the blankt x - high background count					

** Hardness (salt concentration) is factored into the water quality criteria for all of the metals except mercury.

Washington State Department of Ecology
Please send comments to stba461@ecy.wa.gov

(3) Class B (good).

(a) General characteristic. Water quality of this class shall meet or exceed the requirements for most uses.

(b) Characteristic uses. Characteristic uses shall include, but not be limited to, the following:

(i) Water supply (industrial and agricultural).

(ii) Stock watering.

(iii) Fish and shellfish:

Salmonid migration, rearing, and harvesting.

Other fish migration, rearing, spawning, and harvesting.

Clam, oyster, and mussel rearing and spawning.

Crustaceans and other shellfish (crabs, shrimp, crayfish, scallops, etc.) rearing, spawning, and harvesting.

(iv) Wildlife habitat.

(v) Recreation (secondary contact recreation, sport fishing, boating, and aesthetic enjoyment).

(vi) Commerce and navigation.

(c) Water quality criteria:

(i) Fecal coliform organisms:

(A) Freshwater - fecal coliform organism levels shall both not exceed a geometric mean value of 200 colonies/100 mL, and not have more than 10 percent of all samples obtained for calculating the geometric mean value exceeding 400 colonies/100 mL.

(B) Marine water - fecal coliform organism levels shall both not exceed a geometric mean value of 100 colonies/100 mL, and not have more than 10 percent of all samples obtained for calculating the geometric mean value exceeding 200 colonies/100 Ml.

(ii) Dissolved oxygen:

(A) Freshwater - dissolved oxygen shall exceed 6.5 mg/L.

(B) Marine water - dissolved oxygen shall exceed 5.0 mg/L. When natural conditions, such as upwelling, occur, causing the dissolved oxygen to be depressed near or below 5.0 mg/L, natural dissolved oxygen levels may be degraded by up to 0.2 mg/L by human-caused activities.

(iii) Total dissolved gas shall not exceed 110 percent of saturation at any point of sample collection.

(iv) Temperature shall not exceed 21.0° C (freshwater) or 19.0° C (marine water) due to human activities. When natural conditions exceed 21.0° C (freshwater) and 19.0° C (marine water), no temperature increases will be allowed which will raise the receiving water temperature by greater than 0.3° C.

Incremental temperature increases resulting from point source activities shall not, at any time, exceed t=34/(T+9) (freshwater) or t=16/(T) (marine water). Incremental temperature increases resulting from nonpoint source activities shall not exceed 2.8° C.

For purposes hereof, "t" represents the maximum permissible temperature increase measured at a mixing zone boundary; and "T" represents the background temperature as measured at a point or points unaffected by the discharge and representative of the highest ambient water temperature in the vicinity of the discharge.

(v) pH shall be within the range of 6.5 to 8.5 (freshwater) and 7.0 to 8.5 (marine water) with a human-caused variation within the above range of less than 0.5 units.

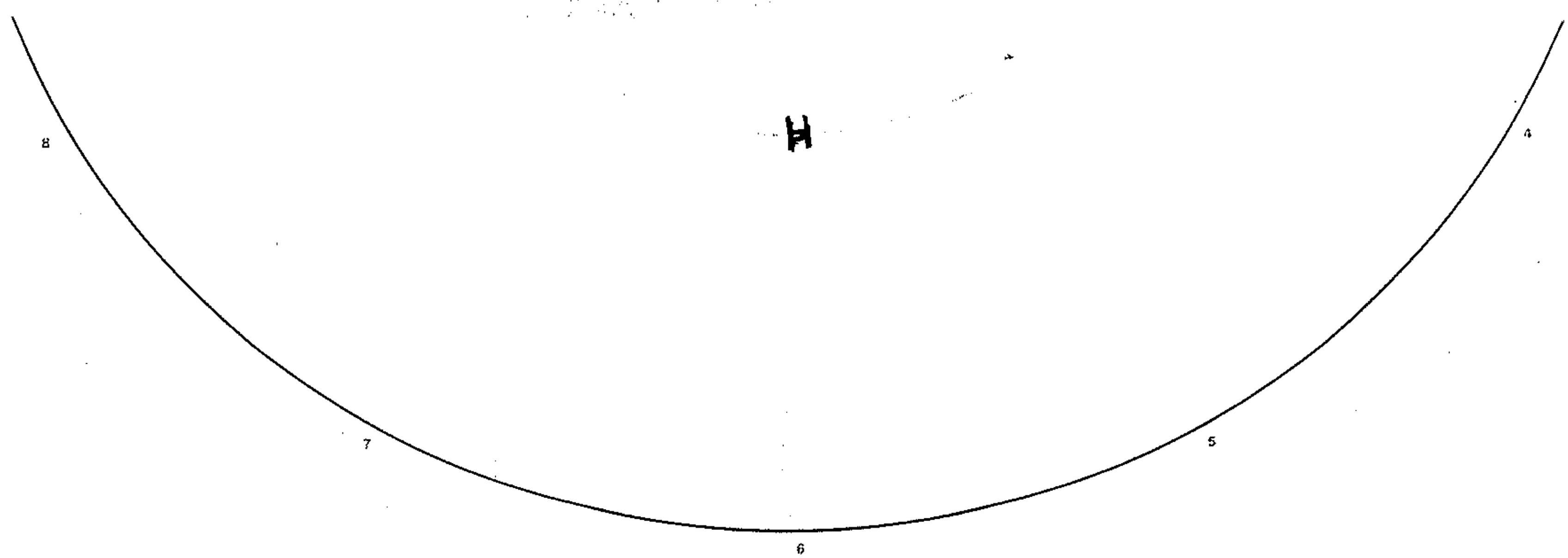
(vi) Turbidity shall not exceed 10 NTU over background turbidity when the background turbidity is 50 NTU or less, or have more than a 20 percent increase in turbidity when the background turbidity is more than 50 NTU.

(vii) Toxic, radioactive, or deleterious material concentrations shall be below those which have the potential either singularly or cumulatively to adversely affect characteristic water uses, cause acute or chronic conditions to the most sensitive biota dependent upon those waters, or adversely affect public health, as determined by the department (see WAC 173–201A–040 and 173–201A–050).

(viii) Aesthetic values shall not be reduced by dissolved, suspended, floating, or submerged matter not attributed to natural causes, so as to affect water use or taint the flesh of edible species.

APPENDIX H

Reservoir Inspection Information



Remarks Not to Scale Res. Has Cathodic Protection Coal tar coating in good condi
Ladder in good contition Picked up Broken antode By Ladder
Wall area above water Line, coating in "Bad" shape peeling & seperation.

LIQUID ENGINEERING CORPORATION
WATER RESERVOIR WORKSHEET

Job Number 970R0101A Water District City of Milton Freewater Date 1-6-97

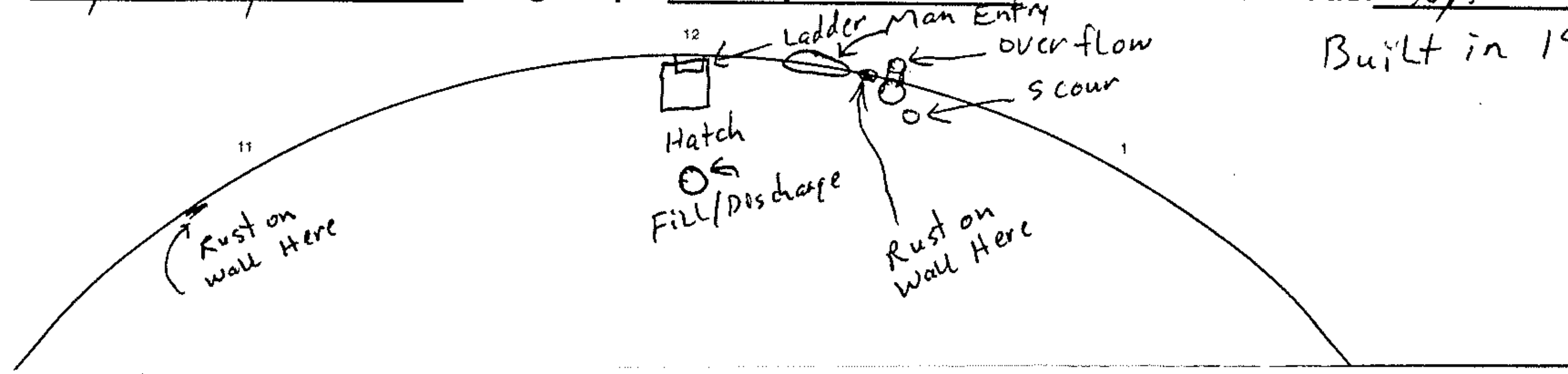
Manager Howard Moss Tank North Res Maintenance Team Jeff Trevor & Bill

Tank: Diameter/Height 90' x 40' Sq. Ft. 6,359 Gallons 2 Million

Construction Steel Bottom Contour Flat Walls Straight Water Depth 38'

Sediment: Type Light silt / small rocks Avg. Depth 1/8" Calculated Cu. Yds. N/A

Built in 1960



TO : Howard Moss
FROM : Steve Bidwell

FILE
1996 RESERVOIR CLEANING

Monday 1-6-97

Started cleaning north Resevoir a 2 million gallon storage tank, the city hired a under-water Diving crew, Liqua Vision Inc. I feel this was a very effective operation from a water supervisor's stand point - the crew was able to completely clean (2) Resevoirs north 2 MG & south 1 MG in (2) days while the complete water system was on line - no well pumps to shut down no draining of storage tanks, no valving to shut off & turn on, the tanks, I feel - very professionally cleaned as the Vedio's shown the north tank had approx 1/8" of sediment on the floor of the tank, the Vacuum system the crew had worked extremely well. it was 36" wide with a water Turbine power nylon brush, it seemed to do an excelent job. the tank overall looked to be in very good shape, there were a few little Rust spots, as the Vedio shows, but nothing of real concern, the tank had (9) support columns all in good shape there was (1) one welded seam that had approx 12-13" of rust, but was superficial no real pitting of any depth, there will be a final Inspection after cleaning is done

Tuesday 1-7-97

Aqua Vision Inc. started cleaning the South Reservior, the bottom of this storage tank had also about 1/8" of sedement but was different in texture then the north tank, seemed to be more sandy especially around fill pipe, where debris was about 1" thick, very dark in color. -

I also noticed (1) one of the anoids used for corrosion protection had fallen from the ceiling to the bottom of the tank, which knocked off some of the coating & is starting to rust, a spot approx 2" around there where some pin holes also in this tank, but again nothing of real significanté this tank had (6) six support columns they also are in good shape, I have some sketches of the tank cavatys problem areas, supports, entry's so forth, also (2) videos

Steve Bushnell
water/street supervisor

APPENDIX I

Umatilla Basin Program - OAR 690-507

The Oregon Administrative Rules contain OARs filed through November 14, 2008

WATER RESOURCES DEPARTMENT

DIVISION 507

UMATILLA BASIN PROGRAM

690-507-0010

Definitions

The following meanings apply to the terms as used in these rules for the Umatilla Basin Program. Other rules of the Department may define these words differently:

(1) "Classification" or "Classified" means the allowed and preferred beneficial use(s) of a given surface or ground water source for which future appropriations of water shall be permitted.

(2) "Commission" means the Water Resources Commission.

(3) "Department" means the Oregon Water Resources Department.

(4) "Director" means the Water Resources Director.

(5) "Minimum Perennial Streamflow" or "Minimum Streamflow" means an administrative rule that establishes a flow necessary to support aquatic life, or recreation or minimize pollution. The rule includes a priority date and specifies streamflow levels for all or any period of the year. It establishes priority for instream use over future appropriations and identifies flow objectives for future management in streams where shortages occur.

(6) "Statutorily Exempt Ground Water Uses" means those uses for which no ground water application, permit, or certificate is required under ORS 537.545. These uses are for:

(a) Stockwatering purposes;

(b) Watering any lawn or noncommercial garden not exceeding one-half acre in area;

(c) Watering the grounds, three acres in size or less, or schools that have less than 100 students and that are located in cities with a population of less than 10,000;

(d) Single or group domestic purpose in an amount not exceeding 15,000 gallons a day;

(e) Down-hole heat exchange purposes; or

(f) Any single industrial or commercial purpose in an amount not exceeding 5,000 gallons a day.

(7) "Subbasin" means any subarea of a basin defined by surface drainage patterns such as the drainage basin of any tributary, or the area draining to any point on a river or draining between two points on a river.

(8) "Umatilla Basin" means the area comprised by the Walla Walla River, Wildhorse Creek, Upper Umatilla River, Birch and McKay Creeks, Columbia-Umatilla Plateau, Butter Creek, and Willow Creek subbasins as shown on Water Resources Department map number 7.6.

(9) "Withdrawal" or "Withdrawn" means an order of the Commission, or State Engineer or a Legislative act prohibiting all new appropriations for particular uses from a source for part or all of the year. A withdrawal can be set for a prescribed length of time or indefinitely until modified by the Commission.

Stat. Auth.: ORS 536 & ORS 537
Stats. Implemented:
Hist.: WRB 26, f. 3-2-64; WRD 1-1981, f. & cert. ef. 4-20-81; WRD 10-1985, f. & cert. ef. 9-3-85; WRD 13, f. & cert. ef. 12-18-85; WRD 14-1985, f. & cert. ef. 12-20-85; WRD 1-1986, RF. & cert. ef. 2-20-86; WRD 1-1987, f. & cert. ef. 2-27-87; WRD 8-1988, f. & cert. ef. 7-5-88; WRD 9-1990, f. & cert. ef. 6-25-90; Administrative Renumbering 1-1993, Renumbered from 690-080-0070

690-507-0020

Policies

(1) All rights to the surface waters of the Umatilla River and its tributaries initiated after September 28, 1987, shall be subordinate to permitted appropriations for the purpose of artificial ground water recharge established before that date.

(2) To support present and proposed basin resource developments, no out-of-basin or out-of-state appropriations of water shall be made or granted by any state agency or public corporation of the state for the waters of the Umatilla River Basin.

(3) Rights to use water for industrial or mining purposes granted by any state agency shall be issued only on condition that any effluent or return flows from such uses shall not interfere with other beneficial uses of water.

(4) Future permits for consumptive water use shall be issued only on condition that efficient water use techniques or water conservation measures are proposed in the application. Failure to implement the proposed measures shall be a violation of the terms of the permit.

(5) Municipal water supplies, interstate cooperation in water management, instream needs, out-of-stream needs, water quality and watershed management are issues of concern in the Umatilla River Basin. The Commission's policies on these issues are as follows:

(a) Municipal water supply: In addressing the issue of municipal water supply in the Umatilla River Basin, it shall be the Commission's policy to:

(A) Assist cities with limited financial resources secure needed capital to develop, expand and improve municipal water supplies;

(B) Promote and aid municipal water conservation and encourage cities to plan for water service emergencies;

(C) Encourage the use of artificial ground water recharge to supplement city ground water supplies and help reduce water level declines in the basalt ground water reservoir;

(D) Encourage and promote the concept of regional municipal water supply systems and preserve the options for proposed systems;

(E) Promote and support the purchase and transfer of water rights to municipal use;

(F) Promote the continued viability of municipal water systems reliant on the basalt ground water reservoir.

(b) Interstate cooperation on water management: In addressing the issue of interstate cooperation on water management, it shall be the Commission's policy to:

(A) Coordinate and cooperate with the state of Washington in managing the water resources of the Walla Walla subbasin to the extent judicial decisions, stipulations and statutory authority allow;

(B) Open negotiations with the Washington Department of Ecology by 1990.

(c) Instream needs: In addressing the issue of instream needs, it shall be the Commission's policy to:

(A) Support the anadromous fish production goals of the Northwest Power Planning Council, Oregon Department of Fish and wildlife and Confederated Tribes of the Umatilla Indian Reservation for the Umatilla River Basin;

(B) Protect and enhance instream values by limiting new uses of water from heavily appropriated streams and managing interconnected surface and ground water conjunctively;

(C) Support and encourage watershed and riparian zone projects which improve instream habitat and water quantity and quality, and which provide multiple water resources benefits.

(d) Out-of-stream use: In addressing the issue of out-of-stream use, it shall be the Commission's policy to:

(A) Require conservation and efficient water use;

(B) Control growth of water demand by limiting new irrigation appropriations on selected streams to stored or conserved water;

(C) Support the efficient use of surplus surface and ground water to supplement declining ground water levels through artificial ground water recharge;

(D) Support development of multipurpose surface storage consistent with policies in paragraphs (A), (B), and (C) of this subsection.

(e) Water quality: In addressing the issue of water quality, it shall be the Commission's policy to:

(A) Encourage and promote a formal ground water quality monitoring program to ensure safe municipal and domestic ground water supplies;

(B) Encourage development of management plans for ground water aquifers susceptible to contamination;

(C) Support surface water quality standards to satisfy selected subbasin beneficial water uses identified in this basin program;

(D) Encourage and promote control of nonpoint and point sources of water pollution.

(f) Watershed management: In addressing the issue of watershed management, it shall be the Commission's policy to:

(A) Encourage and promote improvements in water quality, quantity and related resources through agency-public cooperation and education about the benefits of watershed management;

(B) Encourage public and private landowners and managers to employ best management practices to benefit water quality and quantity;

(C) Encourage and support the retirement of highly erodible cropland as a means to enhance water quality and improve runoff patterns;

(D) Encourage and support riparian and stream channel enhancement as a means of improving flow distribution, water quality and related resource values.

Stat. Auth.: ORS 536 & ORS 537
Stats. Implemented:
Hist.: WRB 26, f. 3-2-64; WRD 1-1981, f. & cert. ef. 4-20-81; WRD 10-1985, f. & cert. ef. 9-3-85; WRD 13, f. & cert. ef. 12-18-85; WRD 14-1985, f. & cert. ef. 12-20-85; WRD 1-1986, RF. & cert. ef. 2-20-86; WRD 1-1987, f. & cert. ef. 2-27-87; WRD 8-1988, f. & cert. ef. 7-5-88; WRD 9-1990, f. & cert. ef. 6-25-90; Administrative Renumbering 1-1993, Renumbered from 690-080-0070

690-507-0030

Walla Walla River Subbasin

(1) Objectives: In developing a program for the management, use and control of the surface and ground water resources of the Walla Walla subbasin, the Commission has the following objectives:

(a) Develop interstate cooperation with Washington in the management of surface and ground water and related resources;

(b) Protect instream values in selected streams by closing them to future appropriations or limiting new appropriations to selected nonirrigation uses;

(c) Preserve the opportunity for future upstream storage for all beneficial uses;

(d) Permit artificial ground water recharge to offset declining ground water levels and supplement existing ground water uses;

(e) Protect municipal ground water supplies;

(f) Prevent new appropriations from causing ground water/ surface water interference.

(2) Surface Water: Appropriation and use of surface water in the Walla Walla River subbasin shall comply with the following provisions:

(a) The unappropriated waters of the Walla Walla River and tributaries from and including the Little Walla Walla Diversion to the state border are withdrawn from further appropriation. This withdrawal does not apply to domestic, livestock, fish and wildlife uses or water released from storage. Frost protection between March 1 and May 15, up to a cumulative total of 35 cfs of permits and rights with priority dates after December 2, 1985, is also exempt from this withdrawal. This withdrawal was established by the Commission on January 17, 1986;

(b) The waters of Dugger Creek and tributaries, being entirely appropriated, are withdrawn from further appropriation. The purpose of the withdrawal is to avoid conflict between new uses and existing rights and administrative problems in the distribution of water resulting from new appropriations. The withdrawal was ordered by the State Engineer on August 12, 1933;

(c) Classification: Permits to use surface water may be issued only for the following classified uses:

(A) The surface waters of the Walla Walla River subbasin generally, are classified for domestic, livestock, irrigation, municipal, industrial, power development (subject to m limitations of OAR Chapter 690, Division 51), mining, fish life, wildlife, recreation, pollution abatement, artificial ground water recharge, and public instream uses only;

(B) The surface waters of the Walla Walla River and tributaries upstream from the Little Walla Walla diversion are classified for domestic, livestock, irrigation of noncommercial lawn and garden not to exceed 1/.2 acre, municipal, mining, fish life, wildlife, recreation, pollution abatement, artificial ground water recharge and public instream uses only;

(C) Subject to the rights and priorities existing on June 24, 1988, and established minimum perennial streamflows, 40,000 acre-feet of the annual yield of the Walla Walla River upstream from the Little Walla Walla diversion is further classified for all beneficial uses in conjunction with storage. All natural flow rights issued on the Walla Walla River and its tributaries upstream from the Little Walla Walla diversion after June 24, 1988, shall be subordinate to this classification. Any storage project built under this classification shall include provisions for municipal, fish and wildlife, and recreation uses acceptable to the Commission;

(D) The surface waters of Mill Creek and tributaries are classified for domestic, livestock, irrigation of noncommercial lawn and garden not to exceed 1/2 acre, fish life, wildlife, pollution abatement, artificial ground water recharge and public instream uses only.

(E) The surface waters of Couse and Pine Creeks and tributaries are classified for domestic, livestock, irrigation or noncommercial lawn and garden not to exceed 1/2 acre, fish life, wildlife, pollution abatement, artificial ground water recharge and public instream uses only.

(d) Storage: Surface waters legally stored and legally released may be used for any beneficial purpose;

(e) Artificial ground water recharge: Use of surface water for ground water recharge shall be subject to the following conditions:

(A) Recharged water used under a secondary permit for irrigation may only provide supplemental water to lands with existing irrigation rights or permits on June 24, 1988;

(B) Diversion of surface water for recharge for irrigation under a secondary permit shall not exceed 3.375 acre feet per acre to be irrigated;

(C) If the recharged water is to be used for municipal or industrial purposes under a secondary permit, the applicant shall demonstrate to the satisfaction of the Commission that it has an active water conservation program; and

(D) Water shall be recharged only between December 1 and May 15.

(f) Minimum perennial streamflows: Minimum streamflows may be established to support aquatic life, minimize pollution or maintain recreation values:

(A) To support aquatic life in accordance with Section 3, Chapter 796, Oregon Laws 1983, no appropriation of water shall be made or granted by any state agency or public corporation of the state for waters of the Walla Walla River and tributaries when flows are below the levels specified in **Table 1**. This limitation shall not apply to domestic and livestock use or to waters legally stored or released from storage; and

(B) To support aquatic life, no appropriations of water except for domestic and livestock uses or waters legally stored or released from storage shall be made or granted by any state agency or public corporation of the state when flows are below the specified levels for the streams listed in **Table 1** with priority dates of 3-31-88.

(3) Ground Water: Appropriation and use of ground water in the Walla Walla River subbasin shall comply with the following provisions:

(a) Classification: Permits to use ground water may be issued only for the following classified uses:

(A) The ground water resources of the Walla Walla River subbasin are classified for statutorily exempt ground water uses (see definition), irrigation, municipal, industrial, power development, low temperature geothermal, mining, fish life, wildlife, recreation, pollution abatement, and artificial ground water recharge; and

(B) Ground water from the basalt reservoir in a five-mile radius around any municipal well of the cities of Athena, Helix, Milton-Freewater, and Weston is classified for municipal, group domestic and statutorily exempt ground water uses (see definition) only. Other uses may be permitted if it is documented that a barrier to ground water movement separates a proposed well from municipal wells and there will be no interference with municipal wells. Applications for other uses of ground water within a five-mile radius of a municipal well shall automatically be referred to the Commission for review and consideration of public interest unless the affected city affirms that is in favor of the proposed appropriation. This classification applies only when the affected city(ies) have a full-time conservation program in effect.

(b) Permits issued to appropriate ground waters that may be hydraulically connected with surface water shall be specially conditioned. The condition shall specify that when exercise of the permit unduly interferes with surface water, the permit will be regulated in favor of the surface water source.

Stat. Auth.: ORS 536 & ORS 537
Stats. Implemented:
Hist.: WRB 26, f. 3-2-64; WRD 1-1981, f. & cert. ef. 4-20-81; WRD 10-1985, f. & cert. ef. 9-3-85; WRD 13, f. & cert. ef. 12-18-85; WRD 14-1985, f. & cert. ef. 12-20-85; WRD 1-1986, RF. & cert. ef. 2-20-86; WRD 1-1987, f. & cert. ef. 2-27-87; WRD 8-1988, f. & cert. ef. 7-5-88; WRD 9-1990, f. & cert. ef. 6-25-90; Administrative Renumbering 1-1993, Renumbered from 690-080-0070

690-507-0040

Wildhorse Creek Subbasin

(1) Objectives: In developing a program for the management, use and control of the surface and ground water resources of the Wildhorse Creek subbasin, the Commission has the following objectives:

(a) Protect instream values by closing streams to future appropriations during the low-flow season and limiting future appropriations during the high-flow season to selected nonirrigation or nonconsumptive uses;

(b) Permit artificial ground water recharge to offset declining ground water levels and supplement existing ground water uses;

(c) Protect municipal ground water supplies;

(d) Prevent new appropriations from causing ground water/surface water interference;

(e) Support efforts to reduce nonpoint source sediment loads in subbasin streams.

(2) Surface Water: Appropriation and use of surface water in the Wildhorse Creek subbasin shall comply with the following provisions:

(a) Wildhorse Creek and tributaries are withdrawn from further appropriation of unappropriated waters during the period June 1 through October 31 each year. The withdrawal does not apply to domestic, livestock, fish and wildlife uses or water released from storage. This action was taken by the Commission on December 2, 1985;

(b) Classification: Permits to use the surface waters of Wildhorse Creek and tributaries may be issued only for domestic, livestock, irrigation of noncommercial lawn and garden not to exceed 1/2 acre, power development (subject to the limitations of OAR Chapter 690, Division 51), mining, fish life, wildlife, recreation, pollution abatement, artificial ground water recharge and public instream uses during the period November 1 through May 31 each year. This classification rescinds the Commission's order of December 2, 1985, withdrawing the Umatilla River and tributaries from further appropriation from November 1 through May 31 each year until December 31, 1988.

(c) Storage: Surface water legally stored during the period November 1 through May 31 and legally released may be used for any beneficial purpose;

(d) Artificial ground water recharge: Use of surface water for ground water recharge shall be subject to the following conditions:

(A) Recharged water used under a secondary permit for irrigation may only provide supplemental water to lands with existing irrigation rights or permits on June 24, 1988;

(B) Diversion of surface water for recharge for irrigation under a secondary permit shall not exceed 2.25 acre feet per acre to

The remainder of OAR 690-507-0010 has not been included because it does not pertain to the City of Milton-Freewater.

CITY OF MILTON-FREEWATER

RESOLUTION NO. 2194

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MILTON-FREEWATER ADOPTING THE UPDATED WATER SYSTEM MASTER PLAN AS REQUIRED BY THE OREGON HEALTH DIVISION

BE IT RESOLVED by the City Council of the City of Milton-Freewater that the City of Milton-Freewater Water Master Plan, such plan as was approved by the Oregon State Water Resources Department and Oregon Health Division is hereby formally approved.

PASSED by the Council and **APPROVED** by the Mayor this 13th day of December 2010.

Lewis S Key

Lewis S. Key, Mayor

CITY OF MILTON-FREEWATER, OREGON

WATER SYSTEM MASTER PLAN

2009

REGISTERED PROFESSIONAL
ENGINEER
18481PE
Brad D. Baird
OREGON
JULY 10, 1996
BRAD D. BAIRD
RENEWS 12-31-09
SIGNED

Adopted by City Council
12/13/10 Resolution #2194
L. Steadman

Anderson·Perry & Associates, Inc.

Civil Engineers

La Grande, Oregon
Walla Walla, Washington

 Job No. 200-53

City of Milton-Freewater

FACT SHEET

MEETING DATE:	AGENDA LOCATION:	ITEM NUMBER:
December 13, 2010	Business Items	4D

DATE: December 3, 2010

TO: Honorable Mayor and City Council

FROM: Dave Bradshaw, Public Works Superintendent DVB

THROUGH: Linda Hall, City Manager LHall

ISSUE: Update of City of Milton-Freewater Water System Master Plan

BACKGROUND: The City is required by the Oregon Health Division to adopt a Water System Master Plan. This cumbersome mandate came to the City over a decade ago and much work and time and money has been expended upon it over the years. Work on the original plan was begun during the year 1999 and took our staff and consultant firm a decade to complete due to the huge number of required elements and data collection and analysis required to be in the plan.

Ironically enough, by the time we received the approval of the first plan, work was already underway to update it and keep it current according to State regulations.

The draft of the update and complete plan was presented to the City Council in March of 2009 by our consultant, Brad Baird of Anderson-Perry & Associates.

We then submitted the updated plan to the Oregon Health Division who have now completed their review and approval of the Water System Master Plan. We are now asking Council to formally approve the plan.

Since it has been a substantial amount of time since the plan was last presented to you, we are re-supplying the Council with copies of the Master Plan, although no changes have been made to it since it was last presented to you in 2009.

BUDGET IMPACT: Not significant. The elements of the plan are already being complied with and monitored as required by our drinking water permit.

RECOMMENDATION: A motion by Resolution No. ______________ Adopting The City of Milton-Freewater's Water System Master Plan.

City of Milton-Freewater

City Council Meeting Agenda

December 13, 2010
Albee Room of City Library
8 SW 8th Avenue
7:00 p.m.

1. **OPENING**
   - A. **Roll Call**
   - B. **Invocation by Councilor Humbert**
   - C. **Pledge of Allegiance**

	Sponsor(s)/Requesting Parties
2. CONSENT CALENDAR ITEMS:	
A. **APPROVAL** of Council Minutes, October 25, 2010*	Leanne Steadman
B. **APPROVAL** of Accounts Payable, Oct. 20 – Nov. 2, 2010*	Leanne Steadman
C. **APPROVAL** of Accounts Payable, Nov. 3 – Nov. 16, 2010	Leanne Steadman
D. **APPROVAL** of Accounts Payable, Nov. 17 – Dec. 7, 2010	Leanne Steadman
E. **APPROVAL** of Liquor License Request from The Bank & Grill Catering Company	Leanne Steadman
F. **RESOLUTION NO. 2191,** Acceptance of the Umatilla County Abstract Votes from the General Election of November 2, 2010	Leanne Steadman
3. PRESENTATIONS:	
A. **RECOGNITION** – December 2010 Employee(s) of the Month ***Shane Wright and Daniel Verkist both Public Works Utility Workers***	Sam Hopkins-Hubbard
4. BUSINESS ITEMS:	
A. **ACCEPTANCE OF BRONZE STATUE** – "Skateboard Boy" Statue was donated by Chuck & Jean Nelson of Skylite Gallery located in Walla Walla, Washington*	Linda Hall
B. **RESOLUTION NO. 2192,** Transfer Funds Due to Unforeseen Revenues and Expenditures	Dave Richmond
C. **RESOLUTION NO. 2193,** Adoption of a Base Fine Schedule for Violations of the City Animal Code	Doug Boedigheimer
D. **RESOLUTION NO. 2194,** Final Adoption of the Water System Master Plan	Dave Bradshaw
E. **RESOLUTION NO. 2195,** Adoption of the Updated Water Management and Conservation Plan	Dave Bradshaw

5. **OPPORTUNITY FOR CITIZENS TO APPROACH THE COUNCIL WITH ISSUES NOT ON THIS AGENDA**

Note: Citizens wishing to make comments should be recognized by the Mayor, speak at the microphone, state their name and address, and limit their remarks to 5 minutes in length.

6. **MANAGER'S REPORT**
7. **COUNCIL ANNOUNCEMENTS**
8. **FINAL ADJOURNMENT**

Note: Location of the Council Meeting is handicapped accessible. If you will need any special accommodations to attend or participate in the meeting, please call 938-8233 (TTD 938-5511) between the hours of 7:00 a.m. and 4:00 p.m. Monday through Friday. As per Resolution No. 1699 dated July 13, 1998, certain City Council meetings are recorded.

***ITEMS CARRIED OVER FROM NOVEMBER 8, 2010 COUNCIL MEETING DUE TO A LACK OF A QUORUM AT THE MEETING**

Mailed 12/14/10 KS

File

CITY OF
MILTON-FREEWATER
P.O. Box 6 • 501 Lamb • Milton-Freewater, OR 97862

December 14, 2010

Oregon Health Division
Drinking Water Program
Attn: Bill Goss
700 SE Emigrant, Suite 200
Pendleton, OR 97801

RE: City of Milton-Freewater Water System Master Plan

Dear Bill,
A copy of the resolution adopting the Water System Master Plan is attached for your records.

Please don't hesitate to contact me at 541-938-8270 if you have any questions.

Sincerely,

K Sheridan

Krista Sheridan
Public Works Assistant/Project Aide

Enc (2)

cc: Brad Baird, Anderson-Perry & Associates, Inc.

CITY OF MILTON-FREEWATER

RESOLUTION NO. 2194

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MILTON-FREEWATER ADOPTING THE UPDATED WATER SYSTEM MASTER PLAN AS REQUIRED BY THE OREGON HEALTH DIVISION

BE IT RESOLVED by the City Council of the City of Milton-Freewater that the City of Milton-Freewater Water Master Plan, such plan as was approved by the Oregon State Water Resources Department and Oregon Health Division is hereby formally approved.

PASSED by the Council and **APPROVED** by the Mayor this 13th day of December 2010.

Lewis S. Key

Lewis S. Key, Mayor