City of Mt. Angel

WATER SYSTEM MASTER PLAN & WATER MANAGEMENT AND CONSERVATION PLAN

Work under this contract has been funded in its entirety with Federal grant funds from the Oregon Community Development Block Grant program.

MSA
Murray, Smith & Associates, Inc.
Engineers/Planners

City of Mt. Angel, Oregon

August 2010

WATER SYSTEM MASTER PLAN

AND

WATER MANAGEMENT AND CONSERVATION PLAN

FOR

CITY OF MT. ANGEL

AUGUST 2010

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Authorization

On May 12, 2008, the consulting engineering firm of Murray, Smith & Associates, Inc. (MSA) was authorized by the City of Mt. Angel (City) to prepare this Water System Master Plan (WSMP) and Water Management and Conservation Plan (WMCP).

Purpose

The City last completed a water system evaluation and master plan in 1995. The City is undertaking this comprehensive analysis of its water supply and distribution system to identify system deficiencies, determine future water distribution system supply requirements, recommend water system facility improvements that remedy existing system deficiencies, provide for future system needs and develop a comprehensive water supply management, conservation and curtailment plan for water use within the City. Upon adoption, this comprehensive document will become the City's new WSMP and WMCP.

Compliance

This plan complies with both water system master planning requirements established under Oregon Administrative Rules (OAR) for Public Water Systems, Chapter 333, Division 61 and requirements for WMCPs as described in OAR Chapter 690, Division 86.

The City anticipates submitting an update of the WMCP ten years from now in 2020, with a progress report being filed five years from now in 2015 as required under OAR 690-86. The WSMP should be updated in five to ten years or as needed to provide current planning for development or changing conditions.

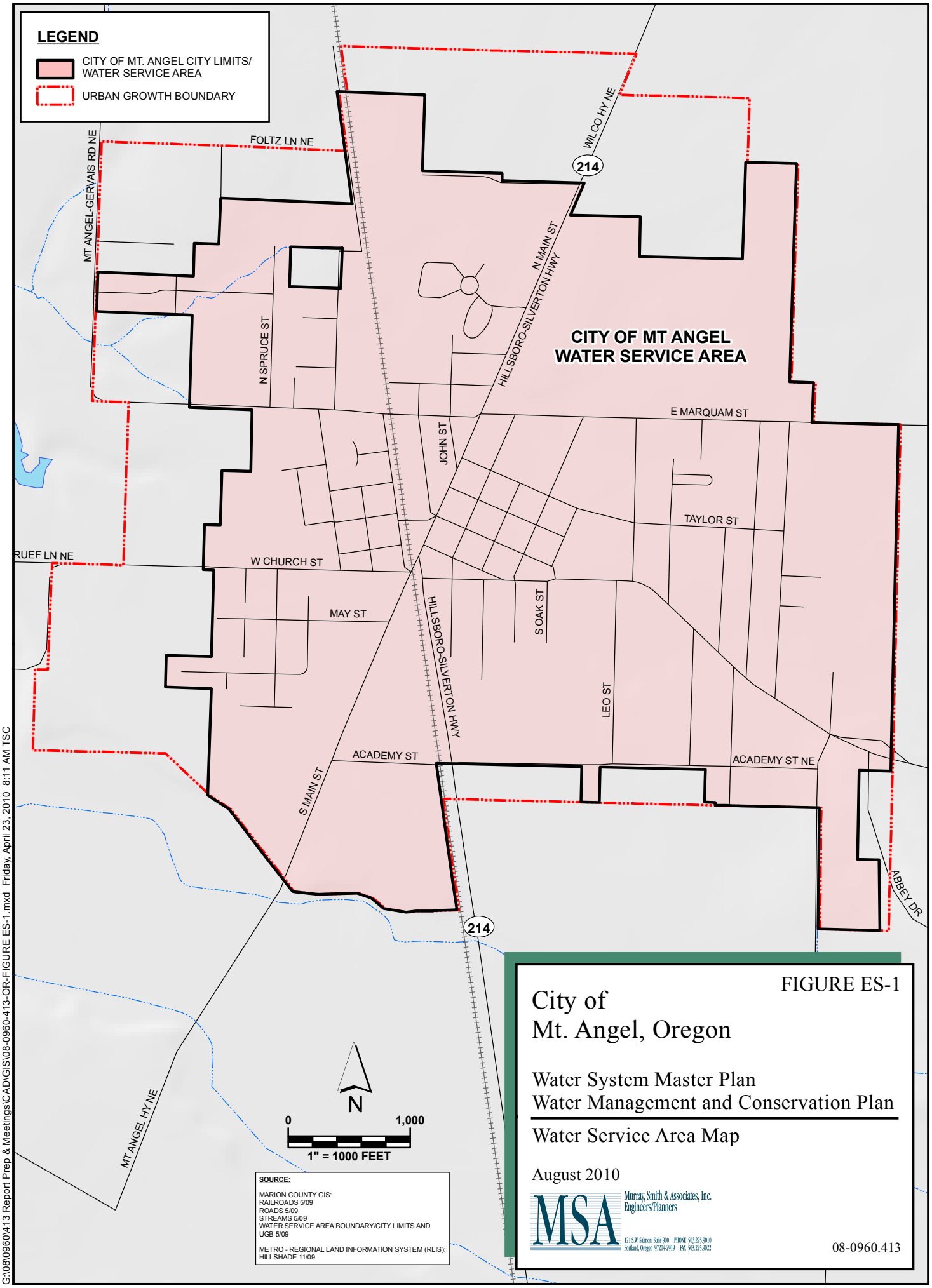
Background and Study Area

The planning area for this plan is the current and future water service area, which is the area within the existing Mt. Angel City limits and Urban Growth Boundary (UGB). The City's water service area encompasses a total area of approximately 641 acres and is illustrated on Figure ES-1. The City's current service area is expected to eventually expand to the Urban Growth Boundary (UGB) limits, adding approximately 221 acres to the service area for a total service area of 862 acres.

Existing System Description

Groundwater Wells

Water is supplied to the City's storage facilities and distribution system from three City operated groundwater wells. The wells produce water year round and serve as the City's sole


LEGEND
CITY OF MT. ANGEL CITY LIMITS/ WATER SERVICE AREA
URBAN GROWTH BOUNDARY
CITY OF MT ANGEL
WATER SERVICE AREA
FOLTZ LN NE
MT ANGEL-GERVAIS RD NE
WILCO HY NE
214
N MAIN ST
HILLSBORO-SILVERTON HWY
N SPRUCE ST
E MARQUAM ST
N JOHN ST
TAYLOR ST
RUEF LN NE
W CHURCH ST
MAY ST
S OAK ST
HILLSBORO-SILVERTON HWY
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MARION COUNTY GIS:
RAILROADS 5/09
ROADS 5/09
STREAMS 5/09
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Mt. Angel, Oregon
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Water Management and Conservation Plan
Water Service Area Map
August 2010
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08-0960.413
G:\08\0960\413 Report Prep & Meetings\CAD\GIS\08-0960-413-OR-FIGURE ES-1.mxd Friday, April 23, 2010 8:11 AM TSC

water supply source. Well Nos. 5, 6 and 7 have an existing combined production capacity of approximately 2.69 million gallons per day (mgd). Several City wells (Old Well, Well Nos. 1, 2, 3 and 4) have been abandoned or taken out of service due to production capacity and/or water quality issues.

Water Rights

The City of Mt. Angel holds one claim, three certificates and one groundwater permit for a total of 6.41 cubic feet per second (cfs). The City currently has 4.65 cfs appropriated to the three active supply wells. Water rights appropriated to Well Nos. 1, 2 and 3 are currently not in use. Water rights appropriated to Well No. 4, which was abandoned, were transferred to Well No. 7 by transfer T-9230. This same water right transfer added Well No. 7 as an additional point of appropriation to the water right certificate for Well No. 5. Well No. 6 operates under a groundwater permit.

Pressure Zones

The City's existing distribution system has one existing service level, or pressure zone. As the topography of the City is fairly consistent, the City's two reservoirs with identical overflow elevations are capable of providing adequate service pressures to the entire water system.

Storage Reservoirs

Mt. Angel's water system contains two (2) reservoirs with a total combined storage capacity of approximately 1.3 million gallons (MG). Water from all three groundwater wells is pumped into the distribution system and conveyed to both reservoirs. Table ES-1 presents a summary of the City's existing storage reservoirs, including capacity and overflow elevations.

Table ES-1
Reservoir Summary

Reservoir Name	General Location	Year Built	Capacity (MG)	Overflow Elevation (ft)
1.0 MG Reservoir	E College St and Humpert Ln	1986	1.0	316.16
0.3 MG Reservoir	E College St and Abbey Dr	1948	0.3	316.16
		TOTAL	**1.3**	

Distribution System

The service area's water distribution system is composed of various pipe materials in sizes up to 16 inches in diameter. The total length of piping in the service area is approximately 20

miles. The transmission and distribution system pipe material includes cast iron, ductile iron, PVC and steel, with galvanized iron and copper pipe used for old 2-inch diameter water mains and service connections.

Water Requirements

Planning Period

The planning period for this master plan is approximately 20 years. Planning and analysis for transmission and distribution facilities is based on saturation development of the City's water system planning area. Saturation development occurs when all existing developable land within the planning area has been developed to its ultimate capacity according to current land use and zoning designations. Typically, if substantial improvements are required beyond the planning period in order to accommodate water demands at saturation development, staging is often recommended for certain facilities where incremental expansion is feasible and practical. Unless otherwise noted, recommended improvements identified in this plan are sized for a 20-year planning horizon within the water system planning area.

Population Forecasts

The City of Mt. Angel currently supplies water to approximately 3,790 people through approximately 910 service connections. Forecasted population estimates are presented in Table ES-2.

Figure ES-2
Population Forecast Summary

Year	Population
2010	4,013
2015	4,272
2020	4,434
2025	4,697
2030	4,977
Build-out	9,238

Water Demand Projections

Estimates of future water demands, shown in Table ES-3, were developed from the City's present per capita water usage and population forecasts from County planning data.

Table ES-3
Water Demand Projection Summary

Year	Water Demand (mgd)	
	Average Day Demand	Maximum Day Demand
2010	0.42	0.84
2015	0.45	0.90
2020	0.47	0.93
2025	0.49	0.99
2030	0.52	1.05

Water Conservation

The City is currently engaged in several different water conservation programs, as described below, to manage the use of the City's limited groundwater supplies.

Full Metering of System

The City's water system is a fully metered system. All non-emergency sources of water are metered. The source meters at the well pumps are monitored and recorded. All customer service connections within the City's service area are also metered.

Meter Testing and Maintenance Program

Well production meters are routinely tested by an outside subcontractor. City billing staff review bimonthly service meter readings to identify significant changes in water use which could be the result of a failing meter. Public works staff replace service meters when needed.

Annual Water Audit

In compliance with annual water use reporting requirements defined in OAR Chapter 690, Division 85, the City conducts a basic annual water audit which is based on available data. The City has experienced an average annual water loss of less than 10 percent for the three years of tabulated data available (2005-2007).

Leak Detection Program

Water loss prevention and leak detection programs are typically implemented when annual water losses regularly exceed 10 percent. The City does not currently plan to implement a leak detection program given the limited unaccounted-for water data that is available.

Leak Repair or Line Replacement Program

The City actively repairs leaks when they are identified and replaces aging water mains as part of their annual water system capital improvements.

Rate Structure Based on Quantity of Water Metered

The City's customers receive a monthly water bill, which includes a base rate service charge and a usage charge. The base rate service charge is a fixed charge which increases with the size of the water meter. The usage charged is based on the customer's water usage, a unit cost per 100 cubic feet of water.

Public Education and Outreach

The City has identified three ways to provide water conservation information to their customers. Water conservation information and website addresses directing customers to further water conservation information will be included on the City's water billing cards, on the City's website, and in the City's public newsletter.

Water Curtailment

The City proposes the following curtailment plan consisting of three stages of alert.

Stage 1 – Moderate Water Supply Shortage

A moderate water supply shortage may be caused by some temporary service interruption associated with one of the City's groundwater wells. It is anticipated that this stage will be triggered by either a planned supply disruption where the duration and timing of the outage is controlled by the City, or where peak demands reach the City's supply capacity over separate consecutive days. This stage of alert may also be triggered as an intermediate stage of an ongoing water supply shortage. The goal of this stage of alert is to achieve a measurable reduction in City-wide daily water usage of 10 percent.

Stage 2 – Severe Water Supply Shortage

A severe water supply shortage may be triggered by a multi-day disruption of service across the City's water supply system, most likely caused by mechanical failure of a major transmission main, etc. The goal of this stage of alert is to achieve an overall decrease in daily water demand of 25 percent.

Stage 3 – Critical Water Supply Shortage

A critical water supply shortage includes emergency conditions under which little or no water is flowing to customers. This can occur as a result of a catastrophic event that results in the

loss of the City's water supply wells or can occur after an extended period of time in which demands exceed supply. The goal of this stage of alert is to achieve an overall decrease in daily water demand of 50 percent or more.

Water Supply Element

A comparison of the City's supply source capacity to the current and future water demands was carried out to determine a timeline for the City to fully exercise each water right and to calculate the system's quantity of unaccounted-for water.

Quantification of Additional Supply Required/Water Rights Implementation Schedule

A comparison of the City's total available water supply to meet the existing and future demands was completed to determine if additional water rights or supply sources would be necessary to meet the City's municipal water supply needs. The City currently holds one claim, three certificates, and one groundwater permit for a total of 6.41 cfs. The City's three active supply wells have been appropriated 4.65 cfs. The total pumping capacity from Well Nos. 5, 6 and 7 is approximately 4.16 cfs with a firm supply capacity of approximately of 2.12 cfs. The City's current maximum day demand is approximately 1.13 cfs and the forecasted maximum day demand for the year 2030 is 1.62 cfs, which is well within the firm capacity of the City's active supply wells. The City has adequate water rights and supply capacity to meet current and future water demands within the planning horizon of this document, therefore no additional supply sources are required in the 20-year planning horizon.

Unaccounted-for Water

Customer water meter records and well production records were reviewed for the City's water system for 2004-2008. The City has experienced an average annual level of unaccounted-for water of 9.7 percent during this period. OAR 690-086-0150(4)(e) requires that a leak detection and repair program be implemented when system leakage exceeds 10 percent. Since the City's present average annual water loss is less than this limit, the City is not required to implement a leak detection and repair program.

Planning and Analysis Criteria

Criteria presented for groundwater supply wells, distribution system piping, service pressures and storage facilities are presented in Section 7. Recommended water needs for emergency use and fire suppression are also presented. These criteria are used in conjunction with the water demand forecasts to complete the analysis of the City's water distribution system.

Water Distribution System Analysis

A computerized hydraulic network analysis program was used to evaluate the performance of the existing distribution system and to aid in the development of proposed system improvements. The computerized model of the City's water system uses a digital base map of the distribution system and InfoWater hydraulic network analysis software. The purpose of the model is to determine pressure and flow relationships throughout the distribution system for a variety of critical water demand and hydraulic conditions. System performance and adequacy is then evaluated.

Modeling Results

The fire flow analysis of the existing distribution system under existing and projected 2030 water demands found that the fire flow requirements in some areas, primarily land zoned for commercial or industrial use, could not be met while still providing for the system's MDD and maintaining minimum service pressures throughout the system without piping improvements. Piping improvements are needed to increase hydraulic capacity primarily in areas zoned commercial or industrial. It is recommended that all new piping in the system be a minimum of 8-inch diameter when serving residential areas, and a minimum of 12-inch diameter when servicing commercial and industrial areas.

Storage Volume Analysis

The total volume of storage required for the City's distribution system includes operational storage, emergency storage and storage for fire suppression. The most significant component of storage is typically emergency storage. Emergency storage is a function of demand and supply redundancy. For the City of Mt. Angel, development of the large underlying regional aquifer at multiple groundwater well locations reduces the risk of emergency conditions requiring the use of emergency storage to serve customer needs. Under existing and future conditions, Well Nos. 6 and 7 provide supply redundancy to meet maximum day demand needs. Loss of the City's largest supply source (Well No. 7) does not require the City to rely on storage to meet system demands, even at the end of the 20-year planning horizon. As such, no additional emergency storage is needed.

Recommendations and Capital Improvement Program

A summary of all the recommended capital improvements are presented in Table ES-4. The recommendations are presented alphabetically by location. Project cost estimates are presented for all recommended improvements. Table ES-4 provides for project sequencing by categorizing projects that are anticipated to be completed between now and 2030 and those improvements that are recommended for construction beyond FY 2030.

Table ES-4
Capital Improvement Program Summary

Category	Project Description	Project Location	CIP Schedule and Project Cost Summary			Estimated Project Cost
			Short-Term (2011-2020)	Medium-Term (2021-2030)	Long-Term (2030+)	
Distribution System Piping	Fire Flow Improvements	Academy Road	$ 312,650			$ 312,650
		Birch Street	$ 166,500			$ 166,500
		Cherry Street		$ 122,500		$ 122,500
		College Street	$ 141,250			$ 141,250
		E Marquam Street	$ 79,550			$ 79,550
		Highway 214		$ 381,100		$ 381,100
		Industrial Way		$ 242,350		$ 242,350
		John Street		$ 199,800		$ 199,800
		May Street		$ 115,000		$ 115,000
		Monroe St and W Marquam St		$ 223,850		$ 223,850
		N Cleveland Street	$ 103,750			$ 103,750
		N Garfield Street	$ 66,250			$ 66,250
		N Pershing Street	$ 167,500			$ 167,500
		N Sheridan Street	$ 65,000			$ 65,000
		Oktoberfest Lateral	$ 36,250			$ 36,250
		Railroad Avenue	$ 162,500			$ 162,500
		W College St and NW Cindy Ln		$ 81,250		$ 81,250
		Wilco Corporate Headquarters		$ 296,000		$ 296,000
	Future Growth/ Redevelopment	Academy Street Extension			$ 157,250	$ 157,250
		Benedictine Sisters of Mt. Angel			$ 294,150	$ 294,150
		E Marquam Street			$ 238,650	$ 238,650
		Highway 214			$ 136,900	$ 136,900
		May Street Extension			$ 255,300	$ 255,300
		N Spruce Street Extension			$ 223,850	$ 223,850
		North UGB Transmission Main			$ 403,300	$ 403,300
		NW UGB North-South Transmission			$ 575,350	$ 575,350
		SW UGB North-South Transmission			$ 212,750	$ 212,750
		SW Maple Street Extension			$ 205,350	$ 205,350
		Transmission Loop West of Hwy 214			$ 638,250	$ 638,250
		W Church Street Extension			$ 159,100	$ 159,100
		W Marquam Street Extension			$ 77,700	$ 77,700
		Winchester Street Extension			$ 103,600	$ 103,600
	Water Main Replacement Program	Funds replacement of aging water mains at $100,000 per year	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 3,000,000
		Sub-Total	*$ 2,301,200*	*$ 2,661,850*	*$ 4,681,500*	*$ 9,644,550*
Supply	Source and Supply	Water Rights Analysis	$ 50,000			$ 50,000
		Sub-Total	*$ 50,000*	*$ -*	*$ -*	*$ 50,000*
Other	Planning Studies	Water Rate and SDC Study	$ 30,000	$ 20,000	$ 20,000	$ 70,000
		Sub-Total	*$ 30,000*	*$ 20,000*	*$ 20,000*	*$ 70,000*
		Capital Improvement Plan (CIP) Total	***$ 2,381,200***	***$ 2,681,850***	***$ 4,701,500***	***$ 9,764,550***

$ 2,381,200 Short-Term Total	$ 2,681,850 Medium-Term Total	$ 5,063,050 20 Year Total
$ 238,120 Annual Average	$ 268,185 Annual Average	$ 253,153 Annual Average

SECTION 1

SECTION 1
INTRODUCTION

Authorization

On May 12, 2008, the consulting engineering firm of Murray, Smith & Associates, Inc. (MSA) was authorized by the City of Mt. Angel (City) to prepare this Water System Master Plan (WSMP) and Water Management and Conservation Plan (WMCP).

Purpose

The City last completed a water system evaluation and master plan in 1995. The City is undertaking this comprehensive analysis of its water supply and distribution system to identify system deficiencies, determine future water distribution system supply requirements, recommend water system facility improvements that remedy existing system deficiencies, provide for future system needs and develop a comprehensive water supply management, conservation and curtailment plan for water use within the City. Upon adoption, this comprehensive document will become the City's new WSMP and WMCP.

Compliance

This plan complies with both water system master planning requirements established under Oregon Administrative Rules (OAR) for Public Water Systems, Chapter 333, Division 61 and requirements for WMCPs as described in OAR Chapter 690, Division 86. Table 1-1 at the end of this section presents a summarized list of the information required under OAR 690-86 for the completion of this WMCP and the location of that information in this plan document.

The City anticipates submitting an update of the WMCP ten years from now in 2020, with a progress report being filed five years from now in 2015 as required under OAR 690-86. The WSMP should be updated in five to ten years or as needed to provide current planning for development or changing conditions.

Review by Affected Local Governments

The draft WSMP and Water Management and Conservation Plan was provided to Marion County for review and comment. Comments from this local government are included in Appendix D.

Scope of Work

The scope of work for this plan includes the following tasks:

- ***Data Gathering:*** Compile and review existing maps, drawings, plans, studies and reports.

- ***Inventory of Existing Facilities:*** Update the inventory of existing water system facilities including storage reservoirs, wells and pump stations, distribution piping and pressure control stations. Document City water rights and current operational practices.

- ***Population and Water Demand Estimates:*** Develop population and water demand forecasts from historical water usage and planning data provided by the City.

- ***System Analysis and Planning Criteria:*** Develop capacity criteria for supply wells, distribution and transmission piping, storage facilities, and pump stations. Define water quality goals and assess fire flow and emergency response needs.

- ***Water System Hydraulic Model:*** Create and calibrate a computerized water distribution system network analysis model.

- ***Hydrogeologic Review:*** Review local hydrogeologic conditions and asses the sustainability of local aquifers in relation to the short and long-term water production capabilities of the City's supply wells.

- ***Perform Water System Analysis:*** Perform a detailed analysis of the City's transmission and distribution system piping and storage capacity needs, evaluate pressure zone limits and provide recommendations for system improvements. Provide analysis of the City's long-term water supply source options.

- ***Prepare Water Conservation Plan:*** Document the City's existing water conservation programs, evaluate their effectiveness and develop recommendations for additional conservation measures in compliance with OAR 690 Division 86 requirements.

- ***Prepare Water Curtailment Plan:*** Review and update the City's current water curtailment plan.

- ***Evaluate Unaccounted-for Water:*** Estimate the volume of un-metered water leaving the system based on the best available recent water use and water sales records provided by the City. Provide recommendations if unaccounted-for water exceeds acceptable levels.

- ***Recommended System Improvements:*** Identify corrective system improvements, based on the water system model and analysis criteria. Recommend long-term water supply source options.

- ***Prepare Capital Improvement Plan:*** Develop estimated project costs for recommended capital improvements including project prioritization based on level of need.

- ***Prepare Plan Document and System Plan Map:*** Prepare a report that documents and describes the planning and analysis work efforts, including a color map identifying all existing and proposed water system facilities. Incorporate report comments from regulatory agencies.

Table 1-1
Oregon Administrative Rule Requirements for WMCP

Item	OAR Reference	Report Section and Page
Water Supplier Description		
Description of Supplier's Source(s)	690-086-0140 (1)	2-1
Delineation of Current Service Area	690-086-0140 (2)	2-1
Assessment of Adequacy and Reliability of Existing Supplies	690-086-0140 (3)	6-2
Quantifications of Present and Historic Use	690-086-0140 (4)	3-1
Summary of Water Rights Held	690-086-0140 (5)	2-4
Description of Customers Served and Water Use Summary	690-086-0140 (6)	3-2
Identification of Interconnections with Other Suppliers	690-086-0140 (7)	N/A
System Schematic	690-086-0140 (8)	Appendix A
Quantification of System Leakage	690-086-0140 (9)	6-2
Water Conservation Element		
Full Metering of Systems	690-086-0150 (4)(b)	4-1
Meter Testing and Maintenance Program	690-086-0150 (4)(c)	4-1
Annual Water Audit	690-086-0150 (4)(a)	4-1
Leak Detection Program	690-086-0150 (4)(e)	4-2
Leak Repair or Line Replacement Program	690-086-0150 (6)(a)	4-2
Rate Structure Based on Quantity of Water Metered	690-086-0150 (4)(d)	4-2
Rate Structure/Billing Practices that Encourage Conservation	690-086-0150 (6)(d)	4-2
Public Education Program	690-086-0150 (4)(f)	4-2
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Reuse, Recycling, Non-potable Opportunities	690-086-0150 (6)(e)	N/A
Other Measures, If Identified by Supplier	690-086-0150 (6)(f)	N/A
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Date for Submittal of Next Update	690-086-0125 (6)	1-1
Additional Time Requested to Meet Previous Benchmarks	690-086-0125 (7)	N/A

SECTION 2

SECTION 2
EXISTING WATER SYSTEM

General

This section describes and inventories the City of Mt. Angel's (City) water service area and water distribution system facilities. Included in this section are descriptions of the existing supply wells, treatment processes, pressure zones, storage facilities and distribution system piping.

Study Area

The City's current water service area includes all areas within the current City limits, which is encompassed by the Urban Growth Boundary (UGB). The City provides potable water to approximately 3,790 people through approximately 910 residential, commercial and industrial service connections. The study area of this planning effort is the City's water service area as illustrated on Figure 2-1.

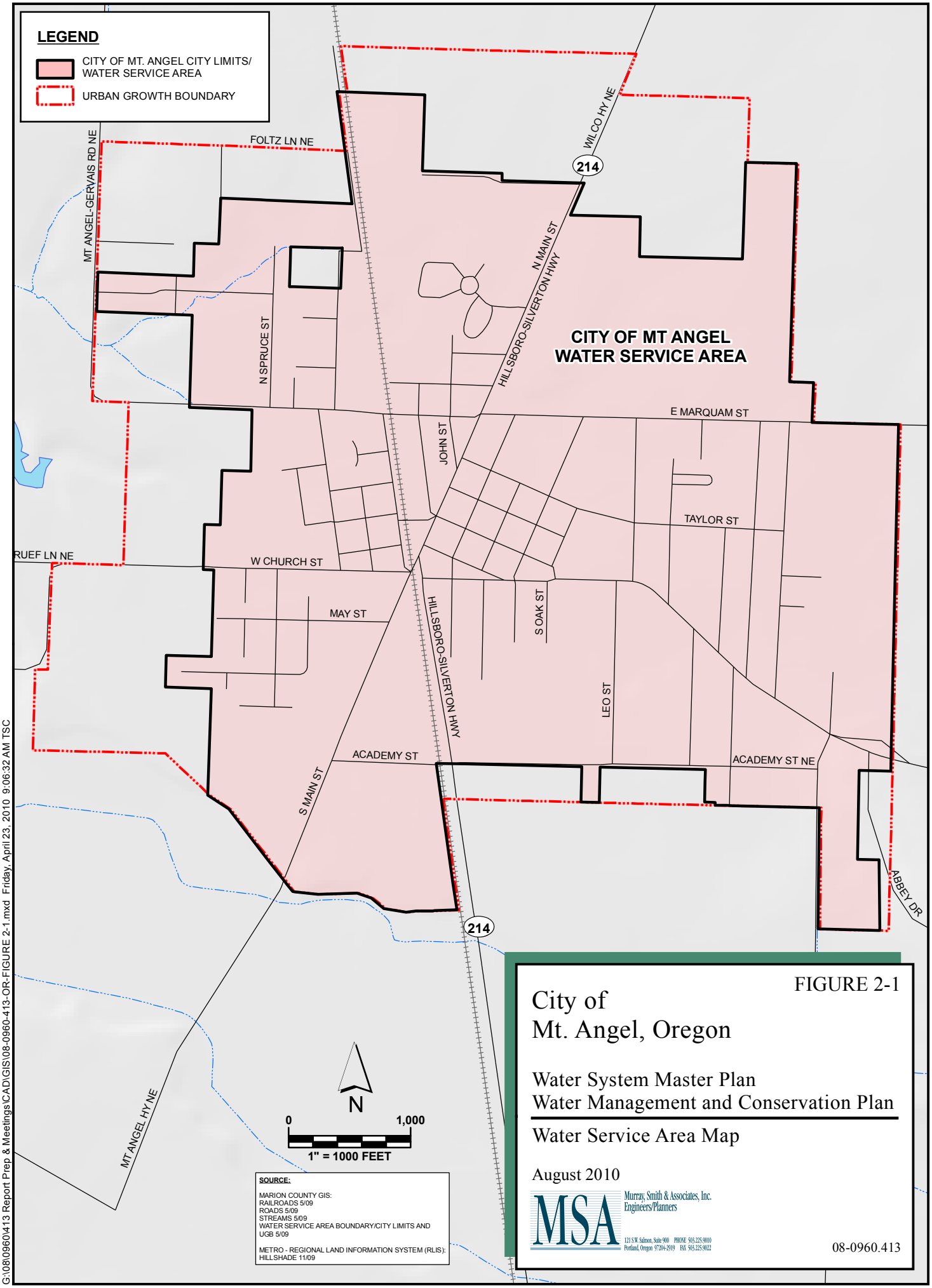
Plate 1 in Appendix A illustrates the City's water system service area limits, water system facilities and distribution system piping. Plate 1 is also a digital representation of the computerized distribution system hydraulic network model used in the water system analysis.

Supply Sources

Groundwater Wells

Water is supplied to the City's storage facilities and distribution system from three City operated groundwater wells. The wells produce water year round and serve as the City's sole water supply source. The City does not currently have any agreements or contracts with surrounding water districts for emergency water supply. Well Nos. 5, 6 and 7 have an existing combined production capacity of approximately 2.69 million gallons per day (mgd). Several City wells (Old Well, Well Nos. 1, 2, 3 and 4) have been abandoned or taken out of service due to production capacity and/or water quality issues. The City's active wells draw from the Columbia River Basalt Group (CRBG) aquifers and all but Well No. 6 are within a designated Groundwater Limited Area (GLA) as designated by the State of Oregon Water Resources Department (OWRD). The implications of the GLA are discussed further in Section 6.

The capacities of Wells Nos. 5, 6 and 7 are a function of the well pump capacity and the transmissivity of the aquifer. One of the primary supply wells, Well No. 6, has a production capacity that exceeds the aquifer's recharge rate, resulting in a drop in the aquifer water level if operated constantly. The City alternates the operation of Well Nos. 6 and 7, allowing the aquifer to recover between pumping periods.


LEGEND
CITY OF MT. ANGEL CITY LIMITS/ WATER SERVICE AREA
URBAN GROWTH BOUNDARY
CITY OF MT ANGEL
WATER SERVICE AREA
FOLTZ LN NE
MT ANGEL-GERVAIS RD NE
WILCO HY NE
214
N MAIN ST
HILLSBORO-SILVERTON HWY
N SPRUCE ST
E MARQUAM ST
N JOHN ST
TAYLOR ST
RUEF LN NE
W CHURCH ST
MAY ST
S OAK ST
HILLSBORO-SILVERTON HWY
LEO ST
ACADEMY ST
ACADEMY ST NE
S MAIN ST
ABBEY DR
214
MT ANGEL HY NE
N
0
1,000
1" = 1000 FEET
SOURCE:
MARION COUNTY GIS:
RAILROADS 5/09
ROADS 5/09
STREAMS 5/09
WATER SERVICE AREA BOUNDARY/CITY LIMITS AND UGB 5/09
METRO - REGIONAL LAND INFORMATION SYSTEM (RLIS):
HILLSHADE 11/09
FIGURE 2-1
City of
Mt. Angel, Oregon
Water System Master Plan
Water Management and Conservation Plan
Water Service Area Map
August 2010
MSA
Murray, Smith & Associates, Inc.
Engineers/Planners
121 S.W. Salmon, Suite 900 PHONE 503.225.9010
Portland, Oregon 97204-2919 FAX 503.225.9022
08-0960.413
G:\08\0960\413 Report Prep & Meetings\CAD\GIS\08-0960-413-OR-FIGURE 2-1.mxd Friday, April 23, 2010 9:06:32 AM TSC

Well No. 5

Well No. 5 is located on the south side of John B Humpert Park, between Birch Street and Alder Street. Constructed in 1975, this well is 650 feet deep with a 12-inch diameter casing. The production zone is between 139 feet and 580 feet below ground surface (bgs). In 1995 and 2005, Well No. 5 was rehabilitated to increase the production capacity of the well after production rates were observed to be declining over time. The City may chose to abandon this well eventually. The existing submersible pump was installed in 1995. The well pump is run constantly, currently producing approximately 50 gallons per minute (gpm).

Well No. 6

Well No. 6 is located adjacent to Walker Ditch, outside of both the water service area and the GLA. Constructed in 1996, the 850 feet deep well has a 12-inch diameter casing down to 690 feet, and a 10-inch diameter perforated liner from 690 feet to 850 feet bgs. This well produces approximately 900 gpm and is one of two primary supply wells for the City.

Well No. 7

Well No. 7 operates in conjunction with Well No. 6 as a primary water source for the City. This well was constructed in 2003 as a replacement for nearby Well No. 4, which was abandoned. The well was drilled to a depth of 642 feet bgs and has a 16-inch diameter casing down to 25 feet and a 16-inch diameter borehole with a 12-inch diameter liner to 642 feet, with perforations from 520 feet to 642 feet bgs. The well has a 150 horsepower vertical turbine pump set at 400 feet bgs, with a production capacity of approximately 915 gpm.

Pertinent information regarding the former and active municipal production wells is summarized in Table 2-1.

Table 2-1
Groundwater Well Summary

Well No.	Well Log/Record	Year Constructed	Pump Type	Hp	Production Capacity (gpm)	Target Aquifer
1	MARI 3115	1925	Out of Service			
2	MARI 3112	1938	Out of Service			
3	MARI 3113	1956	Out of Service			
4	MARI 3105	1963	Abandoned			
5	MARI 3108	1975	Submersible	75	50	Basalt
6	MARI 50456	1996	Vertical Turbine	150	900	Basalt
7	MARI 57164	2003	Vertical Turbine	150	915	Basalt

Water Quality

The City currently does not chlorinate any water pumped into the distribution system from the existing three groundwater supply wells. Previously, groundwater has been treated at Well Nos. 6 and 7 using a sodium hypochlorite (chlorine) injection system. Groundwater currently does not require treatment, and the City shut off these disinfection systems in 2009 in consultation with the Oregon Health Division. The City's groundwater supply meets all required State and Federal drinking water requirements.

Water Rights Summary

The City of Mt. Angel holds one claim, three certificates and one groundwater permit for a total of 6.41 mgd. The City currently has 4.65 cubic feet per second (cfs) appropriated to the three active supply wells. Water rights appropriated to Well Nos. 1, 2 and 3 are currently not in use. Water rights appropriated to Well No. 4 (Permit G-2190 and Certificate 32220), which was abandoned, were transferred to Well No. 7 by transfer T-9230. This same water right transfer added Well No. 7 as an additional point of appropriation to the water right Certificate 56259 (Permit G-6094) for Well No. 5. As a result of these transfer actions, the existing water right certificates 56259 and 32220 have been cancelled and new certificates will be issued once proof is provided to the Oregon Water Resources Department that the water is being put to beneficial use at Well No. 7. The water right permit for Well No. 6 requires action by the City to either file an extension or a Claim of Beneficial Use. A discussion of water rights, their status, and the need for action and recommendations are presented in Sections 6 and 9. Table 2-2 summarizes the water rights held by the City.

Table 2-2
Water Rights Summary

Well	Transfer	Application	Permit	Certificate /Claim	Priority Date	Type of Use[5]	Permitted Production Rate		
							Cubic feet per Second (cfs)	Gallons per Minute (gpm)	Million Gallons per Day (mgd)
1	-	-	-	GR-140	1925 [4]	D, I, M	0.49	220	0.32
2					1938 [4]		0.27	121	0.17
3	-	G-274	G-296	32004	3/21/1956	M	1	449	0.65
6	-	G-14768	G-13638 [6]	-	6/8/1998	M	2.12	952	1.37
5 and 7	T-9230[1]	G-6817	G-6094	56259 [3]	2/18/1975	M	1.2	539	0.78
7	T-9230[1]	G-2380	G-2190	32220 [3]	7/10/1962	M	1.33	597	0.86
Total Water Rights on Record							**6.41**	**2,877**	**4.14**
Total Water Rights Currently in Use[2]							**4.65**	**2,087**	**3.01**

Notes:
1. Transfer Application T-9230 transferred the point of appropriation for Permit G-2190 from Well No. 4 to Well No. 7, and added Well No. 7 as an additional point of appropriation under Permit G-6094 for Well No. 5.
2. Wells No. 1-4 are no longer in use.
3. Certificates 56259 and 32220 were cancelled as a result of Transfer T-9230.
4. GR-140 priority dates are "tentative", and based upon the date that well construction began.
5. Types of beneficial use are D: Domestic, I: Industrial, M: Municipal
6. The authorized date for completion of development under Permit G-13638 is October 1, 2003.

The average daily and monthly production rates from each well are presented in Table 2-3, and were calculated from the monthly well production data reported annually to the OWRD.

Table 2-3
Average Well Production Summary

Year	Well Production Averages (MG)							
	Well No. 4		Well No. 5		Well No. 6		Well No. 7	
	Daily	Monthly	Daily	Monthly	Daily	Monthly	Daily	Monthly
2003	0.005	0.27	0.13	4.08	0.38	11.59	-	-
2004	0.001	0.30	0.13	3.80	0.21	6.42	0.18	9.17
2005	-	-	0.11	3.47	0.19	5.78	0.17	5.11
2006	-	-	0.11	3.23	0.17	5.06	0.12	3.58
2007	-	-	0.09	2.69	0.12	3.61	0.17	5.03

The maximum instantaneous flow rate and annual quantity of water diverted under each water right is difficult to report since multiple wells operate under the same permit. Well No. 6 was observed to have produced a maximum instantaneous flow rate of approximately 1,000 gpm when first constructed. Currently, this well has a maximum flow rate of approximately 900 gpm, which is within the maximum permitted rate of 950 gpm under Permit G-13638. Well Nos. 5 and 7 have a combined maximum instantaneous flow rate of 1140 gpm, as reported by Certificates 56259 and 32220. Therefore, the City's three active supply wells do not exceed the maximum allowable rate of diversion. A summary of the annual water production recorded at each well from 2003 through 2008 is presented in Table 2-4. In 2004, Well No. 4 was taken out of service and Well No. 7 was put online. The addition of Well No. 7 substantially decreased the demand placed on Well No. 6.

Table 2-4
Annual Well Production Summary

Year	Annual Total Well Production (MG)			
	Well No. 4	Well No. 5	Well No. 6	Well No. 7
2003	1.91	48.96	139.06	-
2004	0.30	45.63	77.06	64.18
2005	-	41.69	69.36	61.33
2006	-	38.80	60.76	42.96
2007	-	32.28	43.29	60.39

Pressure Zones

General

The City's existing distribution system has one existing service level, or pressure zone. Pressure zones are usually defined by ground topography and designated by overflow elevations of water storage facilities or outlet settings of pressure reducing facilities serving the zone. As the topography of the City is fairly consistent, the City's two reservoirs with identical overflow elevations are capable of providing adequate service pressures to the entire water system.

Storage Reservoirs

General

Mt. Angel's water system contains two (2) reservoirs with a total combined storage capacity of approximately 1.3 million gallons (MG). Water from all three groundwater wells is pumped into the distribution system and conveyed to both reservoirs. Table 2-5 presents a summary of the City's existing storage reservoirs, including capacity and overflow elevations.

Table 2-5
Reservoir Summary

Reservoir Name	General Location	Year Built	Capacity (MG)	Overflow Elevation (ft)
1.0 MG Reservoir	E College St and Humpert Ln	1986	1.0	316.16
0.3 MG Reservoir	E College St and Abbey Dr	1948	0.3	316.16
		TOTAL	**1.3**	

1.0 MG Reservoir

The City's 1.0 MG reservoir is located in the southeast corner of the service area, south of East College Street and east of Humpert Lane. This reservoir was constructed in 1986 and is the City's primary storage facility. The 1.0 MG cylindrical concrete tank has a diameter of 75 feet, a water depth of approximately 30 feet, and an overflow elevation of 316.16 feet.

0.3 MG Reservoir

The 0.3 MG reservoir is located approximately 350 feet southeast of the 1.0 MG reservoir, south of East College Street and east of Abbey Drive. The cylindrical concrete tank was constructed in 1948, is 50 feet in diameter and has the same overflow elevation as the 1.0 MG tank, at 316.16 feet.

Distribution System

The service area's water distribution system is composed of various pipe materials in sizes up to 16 inches in diameter. The total length of piping in the service area is approximately 20 miles. The transmission and distribution system pipe material includes cast iron, ductile iron, PVC and steel, with galvanized iron and copper pipe used for old 2-inch diameter water mains and service connections. Table 2-6 presents a summary of pipe lengths by diameter and material for the transmission and distribution system.

Table 2-6
Distribution System Pipe Summary

Pipe Diameter	Pipe Material Lengths (miles)					Length (miles)
	Cast Iron	Ductile Iron	PVC	Steel	Unknown	
4-inch or Less	2.84	-	0.14	0.34	0.03	3.34
6-inch	5.62	0.42	-	-	0.86	6.90
8-inch	3.42	3.60	0.02	-	0.01	7.05
10-inch	0.09	0.12	-	-	0.04	0.25
12-inch	0.12	1.78	-	-	0.52	2.42
16-inch	-	0.29	-	-	-	0.29
Total Length (mi)	**12.1**	**6.2**	**0.2**	**0.3**	**1.5**	**20.3**

Summary

This section presents a summary of the City's existing water system, including the supply and transmission systems, storage facilities and distribution system piping. Also included is a discussion of existing groundwater wells, water rights and pressure zones.

SECTION 3
WATER REQUIREMENTS

General

This section presents population projections and the development of water demand forecasts for the City of Mt. Angel's (City) water service area. Population and water demand forecasts are developed from regional and City planning data, current land use designations, historical water demand records and previous City water supply planning efforts.

Planning Area

The planning area for this master plan is the current and future water service area, which is the area within the existing Mt. Angel City limits and Urban Growth Boundary (UGB). The City's water service area encompasses a total area of approximately 641 acres. Figure 2-1 illustrates the City's service area.

Planning Period

The planning period for this master plan is approximately 20 years. Certain planning and facility sizing efforts will use estimated water demands at saturation development. Saturation development occurs when all existing developable land within the planning area has been developed to its ultimate capacity according to current land use and zoning designations. Planning and analysis for transmission and distribution facilities is based on saturation development of the City's water system planning area. This assumption allows for a determination of the ultimate size of facilities. Typically, if substantial improvements are required beyond the planning period in order to accommodate water demands at saturation development, staging is often recommended for certain facilities where incremental expansion is feasible and practical. Unless otherwise noted, recommended improvements identified in this plan are sized for a 20-year planning horizon within the water system planning area.

Historical Population and Water Demands

Historical and Existing Population

The existing population and total number of dwelling units were derived from current estimates from the United States 2000 Census and Portland State University's Population Research Center (PRC), which provides current and historical population estimates for the State of Oregon. The most recent (2009) estimate for the City of Mt. Angel is 3,790. Further discussion regarding existing and forecasted population estimates for the City is presented later in this section.

Historical Water Demand

The term "water demand" refers to all of the water requirements of the system including domestic, commercial, municipal, institutional and industrial. Demands are discussed in terms of gallons per unit of time such as gallons per day (gpd), million gallons per day (mgd) or gallons per minute (gpm). Demands are also related to per capita use as gallons per capita per day (gpcd).

The City maintains bimonthly metered customer water usage records and daily groundwater well production records. Metered customer usage data for the period of record was used to calculate a historical average annual water usage of 142.5 million gallons (MG) and a current annual water usage of 132.6 MG. The bimonthly usage data was divided by the number of days in the given two month period to determine the average daily demand (ADD). The ratio of maximum day consumption to average day consumption is of interest in order to calculate a maximum daily demand (MDD) from the given ADD. This ratio, or "peaking factor," assumed to be approximately 2.0 for a municipality serving a largely residential population, was multiplied by the historical ADD as a means of estimating the historical MDD. The peak monthly demand (PMD) was calculated by converting the largest recorded bimonthly metered volume for a given year to a daily water usage. In the Pacific Northwest, the peak monthly water usage usually occurs in July or August. The City is currently experiencing a decrease in water demands even as the service area population increases, as shown in Table 3-1. The decrease in water demand is due to the Pepsi bottling plant's reduction in water purchasing over the past several years.

The annual per capita water usage is of value in order to calculate future water demand projections based on the projected populations discussed later in this section. Historical per capita water usage was calculated by dividing the ADD and MDD by the City's population. The average per capita water consumption for the City has historically been approximately 104 gpcd, while the maximum per capita consumption is approximately 209 gpcd. Historical population and water demand data are presented in Table 3-1.

Customer Water Use Characteristics

The City currently serves residential, commercial and industrial customers, with the majority of connections being residential. In December 2010, the City will have in-place an updated water billing system which will allow staff to determine water use characteristics by these customer classes. This information will be presented when the City submits an update to this Water Management and Conservation Plan.

Table 3-1
Historical Population and
Water Use Summary

Year	Water Service Area Population	Historical Water Demands					
		Average Day Demand (ADD)		Maximum Day Demand (MDD)		Peak Month Demand (PMD)	
		mgd	gpcd	mgd	gpcd	mgd	gpcd
2002	3,660	0.44	120	0.88	241	0.58	157
2003	3,700	0.40	108	0.80	216	0.57	155
2004[1]	3,600	--	--	--	--	--	--
2005	3,630	0.41	114	0.83	228	0.60	166
2006	3,665	0.35	95	0.69	189	0.53	145
2007	3,755	0.35	94	0.70	187	0.54	143
2008	3,785	0.36	96	0.73	192	0.48	126
2009[2]	3,790	--	--	--	--	--	--
AVERAGE		0.39	104	0.77	209	0.55	149

Notes:
1. 2004 data is incomplete and does not include July through December.
2. Complete 2009 water demand data was not available.

Population Forecasts

Portland State University's PRC has published population projections for the City of Mt. Angel in their report *Population Forecasts for Marion County, its Cities and Unincorporated Area 2010-2030* (PRC, September 2008). Table 3-2 summarizes these population projections provided by the PRC. The build-out population is shown for reference, and is described below.

Table 3-2
Population Forecast Summary

Year	Population
2010	4,013
2015	4,272
2020	4,434
2025	4,697
2030	4,977
Build-out	9,238

Build-out Population Estimate

The forecasted population at saturation development, or build-out, for the City's water system planning area was estimated using Marion County planning data which draws upon current residential densities and United States 2000 Census data to determine the number of potential dwelling units within the Mt. Angel UGB. Assuming that 25 percent of remaining developable land will be necessary for roads and open space, the total number of dwellings at saturation development will be approximately 1,920. Based on an average household size of approximately 2.84 persons per dwelling unit, an ultimate population of approximately 9,238 is anticipated for the City's water system planning area.

Water Demand Projections

Estimates of future water demands were developed from the City's present per capita water usage as summarized in Table 3-1 and population forecasts from County planning data summarized in Table 3-2. For the purposes of this plan, average daily water usage is assumed to be approximately 105 gpcd, which is the average historical daily water usage. Although stated as gallons per person, this estimate accounts for more than just domestic water use. Existing commercial and industrial users are included in the per capita usage trends discussed above. It is assumed that the ratio of commercial and industrial use to residential use will remain similar in the future. Therefore, for planning purposes, increases in commercial and industrial uses are assumed to be addressed in the per capita usage value. Total water demand is assigned a per capita value in order to more accurately project water demands with increasing population. Per capita values given here incorporate water used for commercial, industrial and public purposes as well.

For the purposes of this study, maximum daily per capita usage is estimated at approximately 210 gpcd. Downward water demand trends, currently caused by decreased usage at the Pepsi bottling plant, may potentially be countered in the future by increased usage from existing or new industrial customers. It is therefore prudent to conservatively plan for changes in industrial usage and future industrial customers by averaging the City's per capita water usage over the past 5 years and using this value, 210 gpcd, in projecting future water demands.

Public education campaigns in water conservation throughout the Pacific Northwest are widely credited for measurable changes in water demand. These conservation measures have seen their greatest success in metropolitan areas. It is anticipated that City's maximum daily per capita use can be maintained at approximately 210 gpcd.

Estimated average and maximum day water demands are developed by multiplying the estimated per capita water usage by the anticipated population for that year. Water demand forecasts are summarized in Table 3-3. Since saturation development is anticipated to be far beyond the 20-year planning horizon, no further analysis of saturation development needs are presented in this report.

Table 3-3
Water Demand Projection Summary

Year	Population	Water Demand (mgd)	
		Average Day Demand	Maximum Day Demand
2010	4,013	0.42	0.84
2015	4,272	0.45	0.90
2020	4,434	0.47	0.93
2025	4,697	0.49	0.99
2030	4,977	0.52	1.05

Summary

The City's water system planning area, which includes all developable land within the current UGB, encompasses approximately 641 acres. Land use analysis and growth rates developed by the County anticipate a population within the current City Limits of approximately 4,977 people at 2030, the planning horizon for this analysis.

As tabulated above, the City's maximum daily water demand for 2008 was approximately 0.73 MGD. A maximum daily water demand of 1.05 mgd is anticipated at 2030 within the water system service area.

SECTION 4
WATER CONSERVATION ELEMENT

General

This section describes the City of Mt. Angel's (City) existing conservation programs and evaluates several potential additional conservation programs. As this is the City's first Water Management and Conservation Plan (WMCP) submitted to the Oregon Water Resources Department (OWRD), a progress report on an existing WMCP is not included.

Current and Proposed Water Conservation Program

The City is currently engaged in several different water conservation programs, as described below, to manage the use of the City's limited groundwater supplies.

Full Metering of System

The City's water system is a fully metered system. All non-emergency sources of water are metered. The source meters at the well pumps are monitored and recorded. All customer service connections within the City's service area are also metered.

Meter Testing and Maintenance Program

Well production meters are tested and calibrated approximately every 5 years by an outside subcontractor to ensure that they are accurate and in proper working order. The City has an informal water service meter replacement program that takes into account both the meter's age and any unusual changes in volume read. The City's billing department reviews all meter readings and compares them to past readings to look for large changes that do not match the service's expected water usage. A significant drop or increase in water usage may indicate a meter malfunction or leak and is further investigated by City crews. The City's meter replacement program does not include the systematic replacement of customer meters.

Annual Water Audit

In compliance with annual water use reporting requirements defined in OAR Chapter 690, Division 85, the City conducts a basic annual water audit which is based on available data. The results of this audit are presented in Table 6-1. As indicated in Section 6, the City has experienced an average annual water loss of less than 10 percent for the three years of tabulated data available (2005-2007). Of this unmetered water leaving the system, approximately 1.02 million gallons is used annually for scheduled fire hydrant flushing, an authorized use of water, which is a typical part of the City's water system maintenance work. This volume is based on the number of hydrants flushed annually and the duration and flow rate observed during flushing. Therefore the total unauthorized, unmetered water leaving the City's water system is less than that reported in Section 6.

Leak Detection Program

Water loss prevention and leak detection programs are typically implemented when annual water losses regularly exceed 10 percent. The City does not currently plan to implement a leak detection program given the limited unaccounted-for water data that is available.

Leak Repair or Line Replacement Program

The City actively repairs leaks when they are identified and replaces aging water mains as part of their annual water system capital improvements.

Rate Structure Based on Quantity of Water Metered

The City's customers receive a monthly water bill, which includes a base rate service charge and a usage charge. The base rate service charge is a fixed charge which increases with the size of the water meter. The usage charged is based on the customer's water usage, a unit cost per 100 cubic feet of water.

Public Education and Outreach

The City has identified three ways to provide water conservation information to their customers. The City's bimonthly water billing cards have a section for comments where the City will begin immediately inserting website addresses to direct customers to further water conservation information provided by OWRD. These same website addresses have been posted on the City's website: http://www.mtangelor.org/city_public_works.asp. The City of Mt. Angel also publishes a monthly newsletter in which the Public Works Department will periodically include an article pertaining to a water conservation topic.

Progress Report on Previous WMCP

The City has not previously submitted a WMCP, therefore this requirement does not apply.

Water Use Measurement and Reporting

The City is in compliance with the annual reporting requirements of OAR Chapter 690, Division 85. The City, which holds water rights described in Section 2, completes and submits an annual report for the current year to the OWRD.

Conservation Measures Already Implemented or Required Under Contracts

The City is not required under contract to provide further water conservation measures other than those already described above, therefore this requirement does not apply.

Summary

This section documents the City's current water conservation programs and evaluates various other water conservation measures that should be considered in the WMCP. As identified in this section, the City's current water conservation program addresses all of the required measures.

SECTION 5
WATER CURTAILMENT ELEMENT

General

This section describes a program for the City of Mt. Angel (City) to accomplish a reduction in water use during a water shortage. This section also presents an assessment of the general vulnerability of the City's water supply.

Infrastructure failures tend to be immediate emergencies with little or no warning, and can result from system failures (pump outage, pipe break, etc.) or can be induced by the forces of nature (earthquakes, storms, floods, landslides, etc.). The scenario most likely to occur that could result in the reduction or loss of water supply for the City is a mechanical or structural failure of the infrastructure. Specifically, the loss of one or more of the City's groundwater wells as a result of mechanical failure of the pumping system. A water supply shortage could be long or short-term in duration.

It is not practical to develop a plan that would cover any and all potential emergency scenarios. Rather, the goal is to project a series of probable emergencies that cover a range of water use curtailment measures and develop the protocols for City action, leaving the details flexible and open to the judgment of City staff. This document is being developed for "system-wide" emergencies and water shortages. It may be appropriate to activate the City's Emergency Response Plan if the type and duration of the shortage deem it necessary.

Historical Curtailment Efforts

The City has not experienced a water supply shortage which required the implementation of water rationing or curtailment measures. Even so, the City acknowledges that water shortages are a real possibility, and therefore has developed the following Water Curtailment Plan to ensure that customer water needs are met with the least amount of disruption should a water shortage event occur.

Water Supply Vulnerability Assessment

The City's current water supply is provided by three groundwater production wells, the two primary supply wells tapping into different aquifers. The City's water supply is not a secure source, in that City relies completely on public groundwater with no emergency interties to other water providers. An aquifer contamination event is of concern, and the risk can be minimized with proper wellhead protection measures. The City currently does not own the land surrounding Well Nos. 6 and 7, which therefore may present a potential contamination risk to these supply wells and the aquifers they draw from. Well No. 6 is located on land owned by the Benedictine Sisters of Mt. Angel, who have worked with the City to create a restrictive easement allowing the City to control land uses within the wellhead protection zone as required by the Oregon Drinking Water Program. Well No. 7 is located at a school

on land owned by the Mt. Angel School District, and adjacent to privately owned land. Well No. 5 is located in a City owned park.

Response to an aquifer contamination event is outside the scope of this Water Curtailment Plan. The City's Emergency Response Plan should be activated in such a scenario. This Water Curtailment Plan will address response actions to water shortages due to well pump maintenance.

The initial task in any water system emergency is to determine the current demand and supply so the level and type of emergency can be determined, and the staff and public can be instructed in the appropriate response. The City has two tools available to minimize the impact of a water shortage and ensure adequate supply for its customers.

1. Existing storage within the City's distribution system amounts to approximately 1.3 million gallon (MG) of available capacity if the reservoirs were full when the emergency occurred. Reservoir levels and available storage fluctuates during the day so the assumed available usable storage capacity is 0.87 MG.
2. A Water Curtailment Plan.

Proposed Water Curtailment Plan

The City proposes the following curtailment plan consisting of three stages of alert. A description of each stage of alert, triggers for each stage and possible actions are presented below.

Stage 1 – Moderate Water Supply Shortage

A moderate water supply shortage may be caused by some temporary service interruption associated with one of the City's groundwater wells. It is anticipated that this stage will be triggered by either a planned supply disruption where the duration and timing of the outage is controlled by the City, or where peak demands reach the City's supply capacity over separate consecutive days. This stage of alert may also be triggered as an intermediate stage of an ongoing water supply shortage. The goal of this stage of alert is to achieve a measurable reduction in City-wide daily water usage of 10 percent.

Stage 1 – Triggers

It is anticipated that this stage of alert will be triggered when water demands reach 90 percent of the City's overall available supply capacity for three consecutive days or more. This stage of alert would also be triggered by a planned outage of one of the City's groundwater wells lasting longer than 48 hours when forecasted demands are at 90 percent of the remaining supply capacity.

Stage 1 – Possible Actions

- Stop all internal City water use that is non-essential, such as hydrant flushing
- Issue a notice to the local media
- Send postcard notification to City customers
- Contact partners in water conservation, including affected local businesses such as landscapers, nurseries, etc
- Stop irrigation at City facilities

Stage 2 – Severe Water Supply Shortage

A severe water supply shortage may be triggered by a multi-day disruption of service across the City's water supply system, most likely caused by mechanical failure of a major transmission main, etc. The goal of this stage of alert is to achieve an overall decrease in daily water demand of 25 percent.

Stage 2 – Triggers

It is anticipated that this stage of alert will be triggered when water demands reach 90 percent of the City's overall available supply capacity for seven consecutive days. Should either of the conditions associated with a trigger of Stage 1 occur, and Stage 1 actions fail to reduce water demands, then this stage of alert would be enacted. In addition, if significant and sustained reductions in water pressure are experienced in the distribution system, this stage of alert would be enacted. At this stage of alert, mandatory curtailment measures will be implemented.

Stage 2 – Possible Actions

- All Stage 1 actions
- Implement enforcement provisions including restriction on outdoor water usage

Stage 3 – Critical Water Supply Shortage

A critical water supply shortage includes emergency conditions under which little or no water is flowing to customers. This can occur as a result of a catastrophic event that results in the loss of the City's water supply wells or can occur after an extended period of time in which demands exceed supply. The goal of this stage of alert is to achieve an overall decrease in daily water demand of 50 percent or more.

Stage 3 – Triggers

It is anticipated that this stage of alert will be triggered during the peak water use season if either Well No. 6 or Well No. 7 is physically unavailable for more than five days, or if water demands reach the City's overall available supply capacity for 10 consecutive days.

Stage 3 – Possible Actions

- All Stage 1 and 2 actions

- Enforce the Water Curtailment Plan with warnings, fines and discontinuation of service if necessary

- If necessary, conduct additional emergency actions, including:
  - Begin rationing water
  - Place a moratorium on all new water service connections and new water main extensions

Next Steps

It is recommended that the City review and update any existing water curtailment and rationing resolutions relative to this Plan and detail specific actions including specific staff responsibilities and key contacts in conjunction with the City's Emergency Response Plan procedures. The City should also work with the local media to allow for rapid implementation of this Plan.

The progress report for the WMCP will provide an update of the City's efforts to further refine and establish a framework for initiation of the Curtailment Plan.

Summary

This section presented a Water Curtailment Plan for the City, including its stages, triggers and actions. In the event of a short-term water supply emergency, the City will be able to systematically suggest, require and enforce compliance with the Curtailment Plan.

SECTION 6
WATER SUPPLY ELEMENT

General

This section includes a delineation of the current and future City of Mt. Angel (City) water service area, a comparison of the City's supply source capacity and water demands, an analysis of supply source alternatives and a timeline for the City to fully exercise each water right permit.

Current and Future Service Area

As described in Section 2, the City's current service area encompasses nearly all of the area within the Mt. Angel city limits. The City's current service area is expected to eventually expand to the Urban Growth Boundary (UGB) limits, adding approximately 221 acres to the service area for a total service area of 862 acres. Areas surrounding the City are currently served by individual private wells.

Quantification of Additional Supply Required/Water Rights Implementation Schedule

A comparison of the City's total available water rights, available water supply capacity, and the existing and future water demands was completed to determine if additional water rights or supply sources would be necessary to meet the City's municipal water supply needs. The City currently holds one claim, three certificates, and one groundwater permit for a total of 6.41 cubic feet per second (cfs). The City's three active supply wells have been appropriated 4.65 cfs as described in Section 2. The total pumping capacity from Well Nos. 5, 6 and 7 is approximately 4.16 cfs, with a firm supply capacity of approximately 2.12 cfs. Firm capacity is defined as the available capacity of the City's supply sources with largest single supply out of service, and should be considered to ensure that the water system can meet the maximum day demand (MDD) under these conditions. The City's current MDD is approximately 0.73 mgd, or 1.13 cfs, and the forecasted MDD for the year 2030 is 1.05 mgd, or 1.62 cfs, which is well within the firm capacity of the City's active supply wells. The City therefore has adequate water rights and supply capacity to meet current and future water demands through 2030.

A preliminary calculation was done to estimate the year when the City will have fully exercised their current available water rights. The population projections presented in Section 3 were used to calculate the maximum annual growth rate anticipated during this period, or approximately 1.3 percent. The population was then projected beyond the planning horizon of 2030, multiplied by the current average per capita water usage of 105 gallons per capita day (gpcd) and finally a peaking factor of 2.0 to determine the MDD. The results show that the City's MDD will equal the available water rights of 4.65 cfs by approximately 2110. The population required to support this level of water usage at the current average per capita usage rate is beyond the City's build-out population presented in

Section 2. The current per capita water usage rate, which includes not only residential consumption buy also commercial and industrial usage, is expected to increase over time as the City attracts commercial development and industry, therefore the City is expected to fully exercise their current available water rights prior to 2110.

Source Assessment

As previously discussed, the City's water system is supplied water from three groundwater wells located throughout the City. The City does not have an emergency backup supply. To date, the City's water demand has yet to exceed the supply capacity of these wells. The City's Well Nos. 5 and 7 draw water from basalt aquifers and are located within the Mt. Angel Groundwater Limited Area (GLA). Well No. 6 draws water from a basalt aquifer located outside of the GLA. These aquifers are also a source of water for domestic and irrigation uses outside the City's service area.

The static water levels in these aquifers have been observed to be gradually declining over time, indicating that the aquifers are not being replenished at a rate greater than the consumer demand placed upon them. The water level in Well No. 6 has been measured annually, as required by water right Permit G-13638. The well was artesian when originally drilled in 1996. Since then, the water level has dropped an average of 2.5 feet per year to a current depth of 34.1 feet below ground surface. The decrease in groundwater level observed in Well No. 6 seems to have nearly haulted since 2004 when Well No. 7 was brought online, and now hovers between approximately 30-35 feet bgs, as seen in Appendix C. Section 9 of this report recommends further analysis to determine if the regional aquifers are a reliable future water supply for the City.

Unaccounted-for Water

Customer water meter records and well production records were reviewed for the City's water system for 2004-2008. Table 6-1 summarizes well production, sales and unaccounted-for water during this period. The City performs routine unmetered distribution system flushing and other authorized unmetered uses, including water for fire fighting and limited contractor use for construction, which are included in the unaccounted-for water value. Therefore, actual water loss in the system is less than that calculated in Table 6-1. As shown, the City has experienced an average annual level of unaccounted-for water of 9.7 percent during this period.

OAR 690-086-0150(4)(e) requires that a leak detection and repair program be implemented when system leakage exceeds 10 percent. Since the City's present average annual water loss is less than this limit, the City is not required to implement a leak detection and repair program, and as previously presented, this type of program is not considered as a priority given the limited benefit that would be expected.

Table 6-1
Historical Water Loss Summary

Fiscal Year	Volume Pumped (MG)	Metered Usage (MG)	Annual Loss (MG)	Percent Loss (%)
2004[1]	186.9	--	--	--
2005	172.4	151.3	21.1	12.3%
2006	142.5	126.5	16.0	11.2%
2007	136.0	128.2	7.8	5.7%
2008	--	132.6	--	--
Average	**159.4**	**134.7**	**15.0**	**9.7%**

Note: 1. Some metered usage data in 2004 has been lost.
2. Complete well production data for 2008 was not available at the time of this analysis.

Summary

This section compared the City's future population and water demands to the water rights and well production capacity available to meet those needs within the water service area. As groundwater levels in the City's water supply wells has been observed to be declining over time, further investigation is recommended to determine the long term viability of groundwater as a municipal water supply source. The Mt. Angel water system's unaccounted-for water level is estimated at approximately 9.7 percent.

SECTION 7
PLANNING AND ANALYSIS CRITERIA

General

This section presents the planning and analysis criteria used for the City of Mt. Angel's (City) water system analysis. Criteria are presented for groundwater supply wells, distribution system piping, service pressures and storage facilities. Recommended water needs for emergency use and fire suppression are also presented. These criteria are used in conjunction with the water demand forecasts presented in Section 3 to complete the analysis of the City's water distribution system presented in Section 8.

Water Supply Source

As described in Section 2, the City's sole water supply is from groundwater Well Nos. 5, 6 and 7. During normal operating conditions, these wells produce 50 gpm, 900 gpm, and 915 gpm, respectively. These wells have sufficient production capacity to meet current and future water demands. This analysis of the City's water system will assess the distribution system, both when all three wells are in service and when only Well No. 6 is operating. This latter scenario is representative of the supply system operating at firm capacity with both Well Nos. 5 and 7 out of service.

Distribution System

The water distribution system should be capable of operating within certain system performance limits, or guidelines, under several varying demand and operational conditions. The recommendations of this plan are based on the following performance guidelines, which have been developed through a review of State requirements, American Water Works Association (AWWA) acceptable practice guidelines, Insurance Services Office, Inc. (ISO) guidelines and operational practices of similar water providers.

The distribution system should be capable of providing the recommended fire flow to a given location while, at the same time, supplying the maximum daily demand and maintaining a minimum residual service pressure at any meter in the system of 20 pounds per square inch (psi). This is the minimum water system pressure required by the State of Oregon Department of Human Services, Drinking Water Program. The system should meet this criterion with storage reservoirs approximately two-thirds full.

Typically, proposed or new water mains serving residential areas should be at least 8 inches in diameter in order to supply minimum fire flows. In special cases, 6-inch diameter mains are acceptable if no fire hydrant connection is required, there are limited services on the main, the main is dead-ended, or if looping or future extension of the main is not anticipated.

Service Zone Pressure

As discussed in Section 2, water distribution systems are typically separated into pressure zones or service levels to provide service pressures within an acceptable range to all customers. The City's existing water service area distribution system has only one service level, or pressure zone, since the topography of the water service area is relatively consistent. Pressure zones are usually defined by ground topography and designated by overflow elevations of water storage facilities. The City's two reservoirs are able to serve customers by gravity flow while maintaining acceptable minimum and maximum water pressures at individual service connections.

Generally, 80 psi is considered the desirable upper pressure limit and 40 psi the lower limit. Whenever feasible, it is desirable to achieve the 40 psi lower limit at the point of the highest fixture within a given building being served. Conformance to this pressure range may not always be possible or practical due to topographical relief, existing system configurations and economic considerations. In the case of the upper pressure limit, while pressures in excess of 100 psi may be acceptable in water mains, services must be equipped with individual pressure reducing valves (PRVs) to maintain their static pressures at no more than 80 psi. Table 7-1 summarizes the service pressure criteria used in the analysis of the water system.

Table 7-1
Recommended Service Pressure Criteria

Condition	Pressure (psi)
Minimum Service Pressure Under Fire Flow Conditions	20
Minimum Normal Service Pressure	40
Maximum Service Pressure	80

Storage Volume

Water storage facilities are typically provided for three purposes: operational or equalization storage, fire storage, and emergency storage. A brief discussion of each storage element is provided below. This three component criteria for storage volume is commonly used by other water providers and by the AWWA.

Operational Storage

Operational storage is required to meet water system demands in excess of delivery capacity from the supply source to the reservoirs. Operational storage volume should be sufficient to supply demand fluctuations throughout the day resulting from typical customer water use patterns and is generally considered as the difference between peak hour demand and maximum day demand (on a 24-hour duration basis). In other words, operational storage is

the volume of water available to meet system demands when demands exceed the capacity of the supply source. Standard industry practice indicates that operational storage equal to approximately 25 percent of a system's maximum day demand is typically sufficient for analysis and planning purposes.

Fire Storage

Fire storage should be provided to meet the single most severe fire flow demand within each zone. The fire storage volume is determined by multiplying the recommended fire flow rate by the expected duration of that flow. Specific fire flow and duration recommendations are discussed later in this section.

Emergency Storage

Emergency storage is often provided to supply water from storage during emergencies such as pipeline failures, equipment failures, power outages or natural disasters. The amount of emergency storage provided can be highly variable depending upon an assessment of risk and the desired degree of system reliability. Provisions for emergency storage in other systems vary from none to a volume that would supply a maximum day's flow or higher. A reasonable volume for emergency storage for the water service area is equal to the difference between MDD and the firm supply capacity of the City's groundwater supply wells on a 24-hour basis. This amount of storage volume for emergency purposes is consistent with accepted water industry practices and guidelines for systems without interties for emergency supply.

Recommended system wide storage is the sum of the operational, fire and emergency storage volume components.

Fire Flow Recommendations

While the water distribution system provides water for domestic uses, it is also expected to provide water for fire suppression. The amount of water recommended for fire suppression purposes is typically associated with the local building type or land use of a specific location within the distribution system. Fire flow recommendations are typically much greater in magnitude than the normal maximum day demand present in any local area. Adequate hydraulic capacity must be provided for these potential large fire flow demands.

Fire protection for the City's service area is provided by Mt. Angel Fire District. The fire district has adopted fire flow requirements as defined in the 2007 State of Oregon Fire Code. A summary of fire flow recommendations based on the state fire code, fire flow criteria adopted by similar communities, and fire flow guidelines as developed by the AWWA is presented in Table 7-2. Water stored for fire suppression is typically provided to meet the single most severe fire flow demand. The recommended fire storage volume is determined

by multiplying the fire flow rate by the required flow duration. Table 7-3 summarizes recommended fire flow durations.

Table 7-2
Summary of Recommended Fire Flows

Land Use Type	Applicable Zoning	Recommended Fire Flow (gpm)
Residential - Single	RS, UTF, AR	1,000
Residential - Multiple	RM, MD	1,500
Commercial/Industrial	CG, EFU, IL, P, PS, RC	3,500

Table 7-3
Fire Flow Duration Summary

Recommended Fire Flow (gpm)	Duration (hours)
Up to 3,000	2
3,000 to 4,000	3
Greater than 4,000	4

Summary

The criteria developed in this section are used in Section 8 to assess the system's ability to provide adequate water service under existing conditions and to guide improvements needed to provide for the City's future water needs. Planning criteria for the City's distribution system, pressure zone, and storage facilities are summarized as follows:

- ***Service Pressure Criteria:*** Minimum static service pressures should be at least 40 psi, with a recommended maximum upper limit of approximately 80 psi.

- ***Storage Volume Criteria:*** Recommended storage volume capacity for the City is the sum of the operational, fire and emergency storage volume components.

- ***Fire Flow Criteria:*** The distribution system should be capable of supplying the recommended fire flows while maintaining minimum residual pressures everywhere in the system of 20 psi.

SECTION 8
WATER DISTRIBUTION SYSTEM ANALYSIS

General

This section describes the analysis of the City of Mt. Angel's (City) water distribution system, including an evaluation of the system's existing storage facilities. The analysis is based on water demands presented in Section 3 and the planning and analysis criteria outlined in Section 7. This section includes a detailed evaluation of the City's distribution system and presents findings of a computerized hydraulic network analysis of the system. The findings and recommendations of this water system analysis are developed into a capital improvement program which is summarized in Section 9.

Distribution System Analysis

A computerized hydraulic network analysis program was used to evaluate the performance of the existing distribution system and to aid in the development of proposed system improvements. The computerized model of the City's water system uses a digital base map of the distribution system and InfoWater hydraulic network analysis software. The purpose of the model is to determine pressure and flow relationships throughout the distribution system for a variety of critical water demand and hydraulic conditions. System performance and adequacy is then evaluated on the basis of planning criteria presented in Section 7.

Computerized Hydraulic Network Analysis Model

For modeling purposes, the water distribution system was digitized onto a geographical information systems (GIS) base map derived from data provided by the City. This file and its supporting database were then used to perform the system analysis and to illustrate recommended improvements. The Water System Map, Plate 1, is included in Appendix A.

All pipes are shown as "links" between "nodes" which represent pipeline junctions or pipe size changes. Pipes and nodes are numbered to allow for easy system updating and revision. These numbers have not been shown on Plate 1 for drawing clarity but are available within the computer model for future use. Diameter and length are specified for each pipe although only pipe diameters are illustrated for drawing clarity. Pipe lengths are drawn to approximate scale. An approximate ground elevation is specified for each node. Ground elevations were extracted from available Marion County 10-foot contour topographic data. Hydraulic elements, pumps and reservoirs are also illustrated and operating parameters are incorporated into the model database.

Modeling Conditions

An analysis of the water system was performed to assess the distribution system's ability to provide recommended fire flows throughout the service area during current and future maximum day demand (MDD) conditions. Current water demands, as presented in Section 3, were applied to the existing water system. Pipeline improvements were modeled to ensure the distribution system meets the flow and pressure requirements detailed in Section 7. The analysis was then extended to evaluate system performance under 2030 water demands. Proposed improvements were made to the system model to accommodate distribution needs, and to meet the criteria presented in Section 7, under existing conditions.

All fire flow modeling assumes that the City's storage reservoirs are approximately two-thirds full and that the City's groundwater wells are operating at firm capacity during a power outage. Fire flow scenarios test system performance when providing the recommended fire flow to a given location while at the same time supplying the MDD and maintaining a minimum residual service pressure of 20 pounds per square inch (psi) at all services in the system.

Modeling Results

The fire flow analysis of the existing distribution system under existing and projected 2030 water demands found that the fire flow requirements in some areas, primarily land zoned for commercial or industrial use, could not be met while still providing for the system's MDD and maintaining minimum service pressures throughout the system without piping improvements. Additional hydraulic capacity is needed in the system to correct these deficiencies. Specifically, piping improvements are needed to increase hydraulic capacity in the commercial and industrial areas north of Church Street. Increased transmission capacity is also necessary along Academy Road to improve the water supply available to industrial and commercial land south of Church Street.

Through the analysis it was determined that in order to meet minimum hydraulic capacity requirements, it is recommended that all new piping in the system be a minimum of 8-inch diameter when serving residential areas, and a minimum of 12-inch diameter when servicing commercial and industrial areas. An exception to this would be short dead-end mains where no fire hydrant is required and it is not likely that future looping of the water main will occur.

Recommended distribution system piping improvements are shown on Plate 1 in Appendix A. Further recommended distribution system improvements and cost estimates for these improvements may be found in Section 9.

Pressure Zone Analysis

As discussed in Section 2, the City currently is able to serve its customers with one pressure zone. Typically, municipal water systems are designed to operate at static pressures ranging

from 40 to 100 psi. The City's existing pressure zone configuration supplies water effectively within these pressure ranges.

Storage Volume Analysis

As discussed in Section 7, the total volume of storage required for the City's distribution system includes operational storage, emergency storage and storage for fire suppression. The most significant component of storage is typically emergency storage. Emergency storage is a function of demand and supply redundancy. For the City of Mt. Angel, development of the large underlying regional aquifer at multiple groundwater well locations reduces the risk of emergency conditions requiring the use of emergency storage to serve customer needs. Under existing and future conditions, Well Nos. 6 and 7 provide supply redundancy to meet maximum day demand needs. Loss of the City's largest supply source (Well No. 7) does not require the City to rely on storage to meet system demands, even at the end of the 20-year planning horizon. As such, an emergency storage volume of zero is presented in Table 8-1. Table 8-1 illustrates the individual storage components for operational, fire and emergency purposes under existing demand conditions and projected demands in the year 2030. As Table 8-1 shows, the City's water system contains adequate storage through the planning horizon.

Table 8-1
Storage Volume Recommendation Summary

Year	Storage Components			Recommended Total Storage (MG)	Existing Storage (MG)	Storage Deficit (MG)
	Operating (MG)	Fire[1] (MG)	Emergency (MG)			
2010	0.23	0.63	0	0.86	1.30	0
2030	0.26	0.63	0	0.89	1.30	0

Notes: 1. Single most severe fire flow demand for all pressure zones is assumed to be industrial/commercial at 3,500 gpm for a duration of 3 hours.

Summary

This section developed and presented an analysis of the City's water distribution system. Recommended system improvements discussed in this section are illustrated in Appendix A Water System Map. This system map illustrates recommended piping and reservoir facility improvements needed to correct existing system deficiencies and to serve the City at projected 2030 conditions. Section 9 presents recommended capital improvements and estimates of project costs.

SECTION 9
RECOMMENDATIONS AND CAPITAL IMPROVEMENT PROGRAM

General

This section presents recommended improvements to the City of Mt. Angel's (City) water system based on the analysis and findings presented in Sections 7 and 8. Also presented is a Capital Improvement Program (CIP) schedule for all recommended improvements. All proposed system improvements are illustrated on Plate 1 in Appendix A.

Cost Estimating Data

An estimated project cost has been developed for each improvement project recommendation presented in this section. Cost estimates represent opinions of cost only, acknowledging that final costs of individual projects will vary depending on actual labor and material costs, market conditions for construction, regulatory factors, final project scope, project schedule and other factors. The Association for the Advancement of Cost Engineering (AACE) classifies cost estimates depending on project definition, end usage and other factors. The cost estimates presented here are considered Class 4 with an end usage being a study or feasibility evaluation and an expected accuracy range of -30 percent to +50 percent. As the project is better defined, the accuracy level of the estimates can be narrowed. Estimated project costs include approximate construction costs and an allowance for administrative, engineering and other project related costs.

The estimated costs included in this plan are planning level budget estimates presented in 2010 dollars. Since construction costs change periodically, an indexing method to adjust present estimates in the future is useful. The Engineering News Record (ENR) Construction Cost Index (CCI) is a commonly used index for this purpose. For purposes of future cost estimate updating, the recent ENR CCI for Seattle, Washington is 8665 (April 2010).

Recommended Water System Improvements

General

Presented below are recommended water distribution system improvements for supply, transmission and distribution system piping, as well as additional recommendations. Project cost estimates are presented for all recommended improvements. The recommendations are presented by project type and prioritized as either addressing existing system needs or future growth and development. These categories prioritize improvements into suggested completion times:

- Existing System Needs: 2010 – 2030
- Future Growth/Redevelopment: Beyond 2030

Recommended Supply Improvements

General

Based on the analysis in Section 6, additional water supply sources will not be needed to meet the City's maximum day demand through the planning period of this analysis, 2030. It is recommended that the City pursue exploration and development of a new supply well beyond the planning horizon, as a long-term improvement. Should water demands increase faster than expected or production capacities at the City's existing groundwater wells decrease, the timing of this improvement may need to be accelerated.

Water Rights

Well No. 6 is currently operating under a groundwater permit that requires immediate attention. A Claim of Beneficial Use, or an Extension application, was to have been filed by October 1, 2004 per Permit G-13638. The City must either certificate the rights or file an extension with the Oregon Department of Water Resources (OWRD) to be in compliance.

The City also holds three certificated water rights that are currently appropriated to points of diversion that are no longer in service. The City should consider transferring water rights and claims associated with Well Nos. 1, 2 and 3 to either existing wells or planned supply wells to ensure that the rights are not revoked.

It is recommended that the City complete an analysis of water rights actions needed and proceed with certification, transfers and/or extensions to protect the City's water rights for future water supply needs. The estimated cost of this project is $50,000 and it is recommended that this work be completed as an immediate project.

Recommended Distribution System Improvements

The analysis found that distribution water main improvements are needed to address existing deficiencies and to provide for system expansion and growth. Presented below are recommended water distribution system improvements for transmission and distribution system piping. Project cost estimates are presented for all recommended improvements and categorized as "Existing System Needs" or as "Future Growth/Redevelopment" projects.

Project cost estimates for piping improvements are based on unit costs and several assumptions. It is assumed that each project will be constructed by a private contractor and not City crews. No rock excavation, dewatering, property acquisitions or specialty construction costs are included. Should rock excavation be anticipated, an additional 60 percent should be added to the project cost. A 45 percent contingency has been added, which includes engineering and administration allowances.

Existing System Needs

In order to address deficiencies in fire flow availability associated with existing development and future infill, a number of distribution system improvements are recommended. A description of each of these improvements and estimated projects costs are presented below. Table 9-1 summarizes project information for the projects listed below.

Academy Street - Replace approximately 1,690 linear feet of 8-inch diameter piping along Academy Street with 12-inch diameter piping from NE Humpert Lane to Leo Street. Replacing this water main with one of larger diameter will increase commercial fire flow capacity to the west.

Estimated Project Cost: $312,650

Birch Street - Replace approximately 900 linear feet of 4-inch diameter piping with 12-inch diameter piping on Birch Street between Taylor Street and the existing 8-inch pipeline on the north side of E Marquam Street. Replacing this water main with one of larger diameter will deliver improved fire flows to commercial and industrial areas north of E Marquam Street.

Estimated Project Cost: $166,500

Cherry Street - Replace approximately 980 linear feet of 4-inch diameter piping with 8-inch diameter piping on Cherry Street between E College Street and Taylor Street. Replacing this water main with one of larger diameter will ensure sufficient residential fire flows in the area and improve looping in the system.

Estimated Project Cost: $122,500

College Street - Replace approximately 1,130 linear feet of 4-inch diameter piping with 8-inch line along College Street between Church Street and Highway 214. Replacing this water main with one of larger diameter will deliver improved fire flows to commercial and industrial land in this area and improve looping in the water system.

Estimated Project Cost: $141,250

E Marquam Street - Replace approximately 430 linear feet of 6-inch diameter waterline on E Marquam Street from Elm Street to N Sheridan Street with 12-inch diameter piping. Increased capacity is necessary in this pipeline to provide adequate fire flows to the commercial and industrial areas along E Marquam Street.

Estimated Project Cost: $79,550

Highway 214 - Replace approximately 2,060 linear feet of 8-inch diameter piping on Highway 214 between E Marquam Street and Industrial Way with 12-inch diameter piping.

Replacing this water main with one of larger diameter will ensure sufficient fire flows to the industrial area west of this pipeline.

Estimated Project Cost: $381,100

Industrial Way - Install approximately 1,310 linear feet of 12-inch diameter piping along Industrial Way heading west from Highway 214. Replacing this water main with one of larger diameter will ensure sufficient fire flows to this industrial area.

Estimated Project Cost: $242,350

John Street - Replace approximately 1,080 linear feet of 8-inch diameter piping along John Street starting at W Marquam Street and heading north with 12-inch diameter piping. Replacing this water main with one of larger diameter will ensure sufficient fire flows to the commercial areas along and north of this pipeline.

Estimated Project Cost: $199,800

May Street - Replace approximately 920 linear feet of 4-inch diameter piping on May Street between S Main Street and Fir Street with 8-inch diameter piping. Replacing this water main with one of larger diameter will ensure sufficient fire flows to the residential area west of this pipeline.

Estimated Project Cost: $115,000

Monroe Street and W Marquam Street - Replace approximately 920 linear feet of 6-inch and 8-inch diameter piping on Monroe Street, and along W Marquam Street between Monroe Street and Highway 214, with 12-inch diameter piping. Replacing this water main with one of larger diameter will ensure sufficient fire flows to this commercial area.

Estimated Project Cost: $223,850

N Cleveland Street - Replace approximately 830 linear feet of 2-inch diameter piping with an 8-inch diameter pipeline along N Cleveland Street between E Church Street and Taylor Street. Increasing the capacity of this pipeline will ensure that adequate fire flows are supplied to hydrants in this commercial area and improve looping in the system.

Estimated Project Cost: $103,750

N Garfield Street - Replace approximately 530 linear feet of 2-inch diameter piping on N Garfield Street between College Street and Taylor Street with 8-inch diameter piping. Replacing this water main with one of larger diameter will ensure sufficient fire flows to the commercial lots in this area and improve system looping.

Estimated Project Cost: $66,250

N Pershing Street - Replace approximately 1,340 linear feet of 4-inch diameter piping with an 8-inch diameter pipe along N Pershing Street from W Marquam Street north to the end of

the existing pipeline on N Pershing Street. Increasing the capacity of this pipeline will ensure adequate fire flows are supplied to the commercial and industrial lots in this area and improve looping in the system.

Estimated Project Cost: $167,500

N Sheridan Street - Replace approximately 520 linear feet of 4-inch diameter piping on N Sheridan Street between College Street and Taylor Street with 8-inch diameter piping. Replacing this water main with one of larger diameter will ensure sufficient fire flows to the commercial lots in this area and improve system looping.

Estimated Project Cost: $65,000

Oktoberfest Lateral - Install approximately 290 linear feet of 8-inch diameter piping between the south end of S Garfield Street and S Cleveland Street. Installing this water main will ensure sufficient fire flows to the Oktoberfest pavilions in this area and improve system looping.

Estimated Project Cost: $36,250

Railroad Avenue - Replace approximately 1,300 linear feet of 4-inch diameter piping on Railroad Avenue between W Marquam Street and Highway 214 with 8-inch diameter piping. Increasing the capacity of this pipeline will ensure that adequate fire flows are supplied to the residential areas along this pipeline and to the commercial and residential land northwest of this improvement.

Estimated Project Cost: $162,500

W College Street and NW Cindy Lane - Replace approximately 650 linear feet of 4-inch diameter piping with an 8-inch diameter pipeline along NW Cindy Lane and W College Street west of Lincoln Street. Increasing the capacity of these pipes will ensure that adequate fire flows are supplied to hydrants in this residential neighborhood.

Estimated Project Cost: $81,250

Wilco Corporate Headquarters - Replace approximately 1,600 linear feet of 6-inch to 8-inch diameter piping with a 12-inch diameter pipeline along the western and southern property line of the Wilco Corporate Headquarters to Highway 214. Increasing the capacity of this pipeline will ensure that adequate fire flows are supplied to hydrants in this commercial area and improve looping in the system.

Estimated Project Cost: $296,000

Table 9-1
Distribution Piping Improvements Summary
Existing System Needs

Location	From	To	Diameter (inches)	Length (feet)	Estimated Project Cost
Academy Road	Humpert Lane	Leo Street	12	1,690	$312,650
Birch Street	Taylor Street	E Marquam St	12	900	$166,500
Cherry Street	E College Street	Taylor Street	8	980	$122,500
College Street	Church Street	Highway 214	8	1,130	$141,250
E Marquam Street	Elm Street	N Sheridan Street	12	430	$79,550
Highway 214	E Marquam St	Industrial Way	12	2,060	$381,100
Industrial Way	Hwy 214	West end of Industrial Way	12	1,310	$242,350
John Street	W Marquam Street	North end of John Street	12	1,080	$199,800
May Street	S Main Street	Fir Street	8	920	$115,000
Monroe Street and W Marquam Street	Hwy 214	Monroe St	12	1,210	$223,850
N Cleveland Street	E Church Street	Taylor Street	8	830	$103,750
N Garfield Street	College Street	Taylor Street	8	530	$66,250
N Pershing Street	W Marquam Street	North end of N Pershing Street	8	1,340	$167,500
N Sheridan Street	College Street	Taylor Street	8	520	$65,000
Oktoberfest Lateral	S Garfield Street	S Cleveland Street	8	290	$36,250
Railroad Avenue	W Marquam Street	Highway 214	8	1,300	$162,500
W College Street and NW Cindy Lane	Lincoln Street	North end of NW Cindy Lane	8	650	$81,250
Wilco Corporate Headquarters	Hwy 214	West end of Industrial Way	12	1,600	$296,000
Total					$2,963,050

Future Growth/Redevelopment

As future development within the Urban Growth Boundary (UGB) occurs, it is recommended that the City complete a number of distribution and transmission main projects to assure adequate supply for domestic demands and to provide fire flow capacity. The proposed improvements listed below are generally considered long-term projects beyond the 20-year planning horizon and should be coordinated with future development near the limits of the UGB and major infill development or redevelopment in commercial and industrial land areas. These improvements are described below followed by an estimate of project cost. Table 9-2 summarizes project information for the projects listed below.

Academy Street Extension - Install approximately 850 linear feet of 12-inch diameter piping along the proposed Academy Street extension west to intersect the Winchester Street extension. This water main extension will help provide sufficient fire flows to the commercial and residential areas west of Highway 214 and improve system looping.

Estimated Project Cost: $157,250

Benedictine Sisters of Mt. Angel - Replace approximately 1,590 linear feet of 4-inch and 6-inch diameter piping with 12-inch pipe along Academy Street and through private property owned by the Benedictine Sisters of Mt. Angel, located between Wilco Highway and Highway 214 south of Academy Street. Increasing the capacity of these pipes will ensure that adequate fire flows are available to serve this property and surrounding commercial and industrial areas.

Estimated Project Cost: $294,150

W Marquam Street - Replace approximately 1,290 linear feet of 8-inch diameter waterline on W Marquam Street from Birch Street to Elm Street with 12-inch diameter piping. Increased capacity is necessary in this pipeline to provide adequate fire flows to the commercial and industrial areas along E Marquam Street. This improvement includes extending the 6-inch fire hydrant H122 lateral that connects to the existing 4-inch water line running along the south side of E Marquam Street and tying the lateral in to the upsized 12-inch pipe on the north side of the street to improve looping in the system.

Estimated Project Cost: $238,650

Highway 214 - Install approximately 740 linear feet of 12-inch diameter piping along Highway 214 north to the UGB. This water main extension will help provide sufficient fire flows to the commercial areas west of Highway 214 and create looping in the system.

Estimated Project Cost: $136,900

May Street Extension - Install approximately 1,380 linear feet of 12-inch diameter piping on May Street east to the proposed Southwest UGB Transmission Main. This water main will help provide sufficient fire flows to this residential area and improve system looping.

Estimated Project Cost: $255,300

N Spruce Street Extension - Install approximately 1,210 linear feet of 12-inch diameter piping along the proposed N. Spruce Street extension north to the City limits and west to intersect the proposed Northwest UGB Transmission Main. This water main extension will provide residential fire flows to this area and improve system looping.

Estimated Project Cost: $223,850

North UGB Transmission Main - Install approximately 2,180 linear feet of 12-inch diameter piping west from the UGB on Highway 214 to the City limits, then south along the City limit boundary to Industrial Way. This water main extension will provide commercial fire flows to this area and system looping.

Estimated Project Cost: $403,300

Northwest UGB North-South Transmission Main - Install approximately 3,110 linear feet of 12-inch diameter piping along the western City limits to intersect the proposed W. Church Street extension. This water main will provide sufficient fire flows to the residential areas on the west side of the City and create looping in the system.

Estimated Project Cost: $575,350

Southwest UGB North-South Transmission Main - Install approximately 1,150 linear feet of 12-inch diameter piping along the western City limits, between the proposed W. Chuch Street extension and the SW Maple Street extension. This water main will provide sufficient fire flows to the commercial and residential areas on the west side of the City and create looping in the system.

Estimated Project Cost: $212,750

SW Maple Street Extension - Install approximately 1,110 linear feet of 12-inch diameter piping along the proposed SW Maple Street extension heading west to intersect with the Southwest UGB North-South Transmission Main. This water main will provide sufficient fire flows to the commercial and residential areas in the southwest portion of the City and create looping in the system.

Estimated Project Cost: $205,350

Transmission Loop East of Highway 214 - Install approximately 3,450 linear feet of 12-inch diameter piping in a loop east of Highway 214 which travels east from Industrial Way, south along the City limits, and west to Highway 214 along the southern boundary of the cemetery.

This water main will provide fire flows to the commercial and residential areas in the northeast portion of the City and create looping in the system.

Estimated Project Cost: $638,250

W Church Street Extension - Install approximately 860 linear feet of 12-inch diameter piping along the proposed W Church Street extension heading west to intersect with the proposed Southwest UGB North-South Transmission Main. This water main will provide sufficient fire flows to the commercial and residential areas on the southwest side of the City and create looping in the system.

Estimated Project Cost: $159,100

W Marquam Street Extension - Install approximately 420 linear feet of 12-inch diameter piping along the proposed W Marquam Street extension heading west to intersect with the proposed Northwest UGB North-South Transmission Main. This short section of water main will help create looping in the system.

Estimated Project Cost: $77,700

Winchester Street Extension - Install approximately 560 linear feet of 12-inch diameter piping along the proposed Winchester Street extension south to intersect the proposed Academy Street extension. This water main will help provide sufficient fire flows to this residential and commercial area and improve system looping.

Estimated Project Cost: $103,600

Table 9-2
Distribution Piping Improvements Summary
Future Growth/Redevelopment

Location	From	To	Diameter (inches)	Length (ft)	Estimated Project Cost
Academy Street Extension	Academy Street	Southwest UGB Transmission Main	12	850	$157,250
Benedictine Sisters of Mt. Angel	Academy Street	Private Property	12	1590	$294,150
W Marquam Street	Birch Street	Elm Street	12	1290	$238,650
Highway 214	Industrial Way	UGB	12	740	$136,900
May Street Extension	May Street	Southwest UGB Transmission Main	12	1,380	$255,300
N Spruce Street Extension	N Spruce Street	North of NE Gertner Lane	12	1,210	$223,850
North UGB Transmission Main	West of Hwy 214	West end of Industrial Way	12	2,180	$403,300
Northwest UGB North-South Transmission Main	North of NE Gertner Ln.	W Church Road	12	3,110	$575,350
Southwest UGB North-South Transmission Main	W Church Street	SW Maple Street	12	1,150	$212,750
SW Maple Street Extension	SW Maple Street	Southwest UGB Transmission Main	12	1,110	$205,350
Transmission Loop East of Hwy 214	Industrial Way	South of Cemetery	12	3,450	$638,250
W Church Street Extension	W Church Street	Southwest UGB Transmission Main	12	860	$159,100
W Marquam Street Extension	W Marquam Street	Northwest UGB Transmission Main	12	420	$77,700
Winchester Street Extension	Winchester Street	Academy Street Extension	12	560	$103,600
Total					$3,681,500

Water Main Replacement Program

It is recommended that the City's current water main replacement program continue. This program provides for the routine replacement of leaking, damaged and older water mains throughout the water system. In most cases, the existing mains have adequate capacity and will be replaced with 8-inch diameter mains, or 6-inch diameter for short dead-end mains. It is recommended that $100,000 be budgeted annually for this program. This budget amount allows for complete replacement of the distribution system piping over approximately 100 years.

Additional Recommendations

It is recommended that additional engineering studies be conducted to advance the planning work completed in this master plan. Of highest priority is completion of a cost-of-service (water rate) and System Development Charge (SDC) analysis. Updates to this Water Management and Conservation Plan as Water System Master Plan will also be required within the 20-year planning horizon.

Water Rates and SDC Analysis

A long-term financial planning evaluation and strategy is required to support the recommended CIP. Revenue generated from water rates and system connection fees is typically used to fund operating and maintenance costs, renewal and replacement costs of existing facilities and capital improvement projects. Adequate SDCs should be established to collect funds from new customers to pay for improvements that expand the capacity of the system without placing an undue burden on existing customers. It is also recommended that the City's current water rate structure be evaluated and updated as necessary. It is recommended that approximately $30,000 be budgeted in the next five years to develop the financial plan and $10,000 every five years thereafter to review and update the plan.

Water System Capital Improvement Program

A summary of all the recommended improvements is presented in Table 9-3 which provides for project sequencing by showing prioritized short, medium and long-term recommendations. Short-term recommendations are those suggested to be completed in the next one to ten years, medium-term in the next 11 to 20 years and long-term beyond 20 years in the future. Estimated project costs are also summarized in Table 9-3.

Capital Improvement Program Funding

It is recommended that the City's water system capital improvement program be funded at approximately $250,000 annually. While the funding for certain water system improvements may exceed this amount, the proposed improvements listed in Table 9-3 are phased and

sequenced so that the average annual capital requirement for water system improvements is approximately $250,000 over the 20-year planning horizon.

Financial Evaluation and Plan

The City of Mt. Angel may fund the water system capital maintenance and improvement programs from a variety of sources. In general, these sources can be summarized as: 1) governmental grant and loan programs, 2) publicly issued debt, and 3) cash resources and revenues. These sources are described below.

Government Loan and Grant Programs

Oregon State Safe Drinking Water Financing Program

Annual grants from the U.S. Environmental Protection Agency (EPA) and matching state resources support the Safe Drinking Water Fund. The program is managed jointly by the Department of Human Services (DHS) - Drinking Water Program and the Oregon Business Development Department (OBDD). The Safe Drinking Water Fund program provides low-cost financing for construction and/or improvements of public and private water systems. This is accomplished through two (2) separate programs: the Safe Drinking Water Revolving Loan Fund (SDWRLF) for collection, treatment, distribution and related infrastructure, and the Drinking Water Protection Loan Fund (DWPLF) for sources of drinking water improvements prior to the water system intake.

SDWRLF lends up to $8 million per project, with a possibility of subsidized interest rate and principal forgiveness for a Disadvantaged Community. The standard loan term is 20 years or the useful life of project assets, whichever is less, with interest rates at 80 percent of the current state/local bond rate. The maximum award for the DWPLF is $100,000 per project.

Table 9-3
Capital Improvement Program Summary

Category	Project Description	Project Location	CIP Schedule and Project Cost Summary			Estimated Project Cost
			Short-Term (2011-2020)	Medium-Term (2021-2030)	Long-Term (2030+)	
Distribution System Piping	Fire Flow Improvements	Academy Road	$ 312,650			$ 312,650
		Birch Street	$ 166,500			$ 166,500
		Cherry Street		$ 122,500		$ 122,500
		College Street	$ 141,250			$ 141,250
		E Marquam Street	$ 79,550			$ 79,550
		Highway 214		$ 381,100		$ 381,100
		Industrial Way		$ 242,350		$ 242,350
		John Street		$ 199,800		$ 199,800
		May Street		$ 115,000		$ 115,000
		Monroe St and W Marquam St		$ 223,850		$ 223,850
		N Cleveland Street	$ 103,750			$ 103,750
		N Garfield Street	$ 66,250			$ 66,250
		N Pershing Street	$ 167,500			$ 167,500
		N Sheridan Street	$ 65,000			$ 65,000
		Oktoberfest Lateral	$ 36,250			$ 36,250
		Railroad Avenue	$ 162,500			$ 162,500
		W College St and NW Cindy Ln		$ 81,250		$ 81,250
		Wilco Corporate Headquarters		$ 296,000		$ 296,000
	Future Growth/ Redevelopment	Academy Street Extension			$ 157,250	$ 157,250
		Benedictine Sisters of Mt. Angel			$ 294,150	$ 294,150
		E Marquam Street			$ 238,650	$ 238,650
		Highway 214			$ 136,900	$ 136,900
		May Street Extension			$ 255,300	$ 255,300
		N Spruce Street Extension			$ 223,850	$ 223,850
		North UGB Transmission Main			$ 403,300	$ 403,300
		NW UGB North-South Transmission			$ 575,350	$ 575,350
		SW UGB North-South Transmission			$ 212,750	$ 212,750
		SW Maple Street Extension			$ 205,350	$ 205,350
		Transmission Loop West of Hwy 214			$ 638,250	$ 638,250
		W Church Street Extension			$ 159,100	$ 159,100
		W Marquam Street Extension			$ 77,700	$ 77,700
		Winchester Street Extension			$ 103,600	$ 103,600
	Water Main Replacement Program	Funds replacement of aging water mains at $100,000 per year	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 3,000,000
		Sub-Total	*$ 2,301,200*	*$ 2,661,850*	*$ 4,681,500*	*$ 9,644,550*
Supply	Source and Supply	Water Rights Analysis	$ 50,000			$ 50,000
		Sub-Total	*$ 50,000*	*$ -*	*$ -*	*$ 50,000*
Other	Planning Studies	Water Rate and SDC Study	$ 30,000	$ 20,000	$ 20,000	$ 70,000
		Sub-Total	*$ 30,000*	*$ 20,000*	*$ 20,000*	*$ 70,000*
		Capital Improvement Plan (CIP) Total	***$ 2,381,200***	***$ 2,681,850***	***$ 4,701,500***	***$ 9,764,550***

$ 2,381,200 Short-Term Total	$ 2,681,850 Medium-Term Total	$ 5,063,050 20 Year Total
$ 238,120 Annual Average	$ 268,185 Annual Average	$ 253,153 Annual Average

Special Public Works Fund

The Special Public Works Fund program provides funding for the infrastructure that supports job creation in Oregon. Loans and grants are made to eligible public entities for the purpose of studying, designing and building public infrastructure that leads to job creation or retention. There are four (4) major project categories eligible for funding under this program:

- Public infrastructure needed to support job creation
- Community facilities that support the local economy
- Essential Community Facilities Emergency Projects
- Railroads

Water systems are listed among the eligible infrastructure projects to receive funding. The Special Public Works Fund is comprehensive in terms of the types of project costs that can be financed. As well as actual construction, eligible project costs can include costs incurred in conducting feasibility and other preliminary studies and for the design and construction engineering.

The Fund is primarily a loan program. Grants can be awarded, up to the program limits, based on job creation or on a financial analysis of the applicant's capacity for carrying debt financing. The total loan amount per project cannot exceed $15 million. The OBDD is able to offer discounted interest rates that typically reflect low market rates. In addition, the Department absorbs the associated costs of debt issuance thereby saving applicants even more on the overall cost of borrowing. Loans are generally made for 20-year terms, but can be stretched to 25 years under special circumstances.

Water/Wastewater Fund

The Water/Wastewater Fund was created by the Oregon State Legislature in 1993. It was initially capitalized with lottery funds appropriated each biennium and with the sale of state revenue bonds since 1999. The purpose of the program is to provide financing for the design and construction of public infrastructure needed to ensure compliance with the Safe Drinking Water Act or the Clean Water Act.

Eligible activities include costs for construction improvement or expansion of drinking water, wastewater or storm water systems. To be eligible, a system must have received, or is likely to soon receive, a Notice of Non-Compliance by the appropriate regulatory agency, associated with the Safe Drinking Water Act or the Clean Water Act. Projects also must meet other state or federal water quality statutes and standards. Funding criteria include projects that are necessary to ensure that municipal water and wastewater systems comply with the Safe Drinking Water Act or the Clean Water Act.

In addition, other limitations apply including:

- The project must be consistent with the acknowledged local comprehensive plan.
- The municipality will require the installation of meters on all new service connections to any distribution lines that may be included in the project.
- The funding recipient shall certify that a registered professional engineer will be responsible for the design and construction of the project.

The Water/Wastewater Fund provides both loans and grants, but it is primarily a loan program. The loan/grant amounts are determined by a financial analysis of the applicant's ability to afford a loan including the following criteria: debt capacity, repayment sources and other factors.

The Water/Wastewater Fund financing program's guidelines, project administration, loan terms and interest rates are similar to the Special Public Works Fund program. The maximum loan term is 25 years or the useful life of the infrastructure financed, whichever is less. The maximum loan amount is $15,000,000 per project through a combination of direct and/or bond funded loans. Loans are generally repaid with utility revenues or voter-approved bond issuance. A limited tax general obligation pledge may also be required. Certain entities may seek project funding within this program through the sale of state revenue bonds.

Public Debt

Revenue Bonds

Revenue bonds are commonly used to fund utility capital improvements. The bond debt is secured by the revenues of the issuing utility and the debt obligation does not extend to other City resources. With this limited commitment, revenue bonds typically require security conditions related to the maintenance of dedicated reserves referenced as bond reserves and financial performance measures which are added to the bond debt as service coverage. In order to qualify to sell revenue bonds, the City must show that the net revenue defined as total revenue less operating and maintenance expense, for the water fund is equal to or greater than a standard factor, typically 1.2 to 1.4 times the annual revenue bond debt service. This factor is commonly referred to as the coverage factor, and is applicable to revenue bonds sold on the commercial market. There is no bonding limit, except the practical limit of the utility's ability to generate sufficient revenue to repay the debt and meet other security conditions. In some cases, poor credit may impair a community's ability to acquire and use revenue bonds.

Revenue bonds incur relatively higher interest rates than government programs, but due to the highly competitive nature of the low-interest government loans, revenue bonds are assumed to be a more reliable source of funding as they typically can be obtained by most communities.

Water Fund Cash Resources and Revenues

The City's financial resources available for capital funding include rate funding, cash reserves, and SDCs.

SDCs are sources of funding generated through development and system growth and are typically used by utilities to support capital funding needs. The charge is intended to recover a fair share of the costs of existing and planned facilities that provide capacity to serve new growth.

Oregon Revised Statute (ORS) 223.297 – 223.314 defines SDCs and specifies how they shall be calculated, applied and accounted for. By statute, an SDC amount can be structured to include one or both of the following two components:

- *Reimbursement Fee* – Intended to recover an equitable share of the cost of facilities already constructed or under construction.
- *Improvement Fee* – Intended to recover a fair share of future, planned, capital improvements needed to increase the capacity of the system.

The reimbursement fee methodology must consider such things as the cost of existing facilities and the value of unused capacity in those facilities. The calculation must also ensure that future system users contribute no more than their fair share of existing facilities costs. Reimbursement fee proceeds may be spent on any capital improvements or debt service repayment related to the system for which the SDC is applied. For example, water reimbursement SDCs must be spent on water improvements or water debt service.

The improvement fee methodology must include only the cost of projected capital improvements needed to increase system capacity. In other words, the cost of planned projects that correct existing deficiencies, or do not otherwise increase capacity, may not be included in the improvement fee calculation. Improvement fee proceeds may be spent only on capital improvements (or related debt service), or portions thereof, that increase the capacity of the system for which they were applied.

Summary

This section presents recommendations for improvements to the City's water system. The total estimated project cost of these improvements is approximately $9.7 million for the 20-year planning horizon and beyond to the ultimate full development of the City's existing UGB. Approximately $5 million of the total estimated improvement cost is for improvements needed within the 20-year planning horizon. Of the improvements required in the 20-year planning horizon, approximately $2.3 million of these improvements are required in the next ten years. Approximately $250,000 per year should be budgeted over the next 20 years for the completion of these projects. Financial planning work is recommended to evaluate overall water system financial needs and to identify funding options and alternatives.

APPENDIX

APPENDIX A
Water System Master Plan Map

APPENDIX B
Water Rights Documentation

REGISTRATION NO. GR-146

CERTIFICATE NO. GR140

Registration Statement

OF CLAIMANT OF RIGHT TO APPROPRIATE GROUND WATER

(Under Chapter 708, Oregon Laws 1955.)

TO THE STATE ENGINEER OF OREGON:

I, City of Mt. Angel, Oregon

of Mt. Angel County of Marion

State of Oregon, do hereby make application for a certificate of registration as evidence of a right to appropriate ground water.

1. Source from which water is withdrawn is Pump well #1 (Flowing well, pump well, infiltration trench, or tunnel)

2. Location is: East College Street in Mt. Angel (Approximate distance and direction from nearest city or town)

and is more particularly described as follows:

(a) 1800 feet South and 1500 feet west from NE corner of section 10. (Give distance and bearing to corner of section or other legal subdivision)

being within SW ¼ of NE ¼ (Smallest legal subdivision) of Sec. 10, Twp. 6 S (N. or S.), Rge. 1 W (E. or W.)

or (b) within limits of recorded platted property, town or city: Mt. Angel, Oregon

in Lot _____, Block _____ of _____ (Name of plat or addition)

Mt. Angel (If within city or town, give name) County of Marion

3. Construction Work was begun on 1925 (Date); was completed on 1925 (Date)

and the ground water claimed was first used for the purposes set out below on 1925 (Date)

since which time the water has been used continously (Continuously or intermittently)

from 1925 (Date) to present (Date)

4. Quantity of water claimed and used is 220 gallons per minute; _____ acre feet per year.

5. Purpose or Purposes for which water is used domestic, industrial and municipal

(Domestic, irrigation, municipal, manufacturing, industrial, etc.)

6. Description of Wells: Depth 35 feet. Type drilled (Dug or drilled)

diameter 12 inches. Elevation of ground at well site 200 (As near as known) feet, mean sea level.

Depth to water table 30 feet.

7. Capacity of Well: 220 g.p.m. with 40 feet drawdown.

240 g.p.m. with 50 feet drawdown.

Date of test November 1955

If Flowing Well: Measured discharge _____ g.p.m. on _____ (Date)

Shut-in pressure at ground surface _____ lbs. per sq. in. on _____ (Date)

Water is controlled by _____ (Cap, valve, etc.)

8. **Casing:** (Give diameter, commercial specifications and depth below ground surface of each casing size.)

12 inch diameter Standard Well Casing from Surface to 235 feet

_____ inch diameter _____ from _____ to _____ feet

_____ inch diameter _____ from _____ to _____ feet

_____ inch diameter _____ from _____ to _____ feet

Describe and show depth of shoe, plug, adapter, liner or other details: _____

9. **Perforated Casings or Screens:**

Unknown (Number per foot and size of perforations, or describe screen) from 70 ft. to 110 ft.

Unknown from 140 ft. to 160 ft.

Unknown from 225 ft. to 235 ft.

from _____ to _____

10. **Log of Well:** (Describe each stratum or formation clearly, indicate if water bearing, and give thickness and depth as indicated.)

MATERIAL	Thickness (Feet)	Depth to Bottom (Feet)
Unknown		

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11. **Infiltration Trench:** Covered or open .....

Dimensions: Length ..... ft. **Minimum depth** ..... ft. **Maximum depth** ..... ft.

Bottom width ..... ft. Discharge ..... g.p.m. **Date of test** .....

12. **Tunnel: Type of lining** .....

Dimensions: .....
(Length, course, and cross sectional size)

Position of water bearing stratum with reference to **portal of tunnel** .....

Log of tunnel: (Preceding table for log of well may be used, if desired. Give footage from portal and character of materials, as pertinent.)

13. **Pumping Equipment:**

(a) **Pump** U. S. Turbine Pump (Make, type and size) **Capacity** 300 **g.p.m.**

(b) **Motor** G. E. - 30-HP (Type and horsepower)

14. **Location of area irrigated or to be irrigated, or place of use if for purposes other than irrigation.**

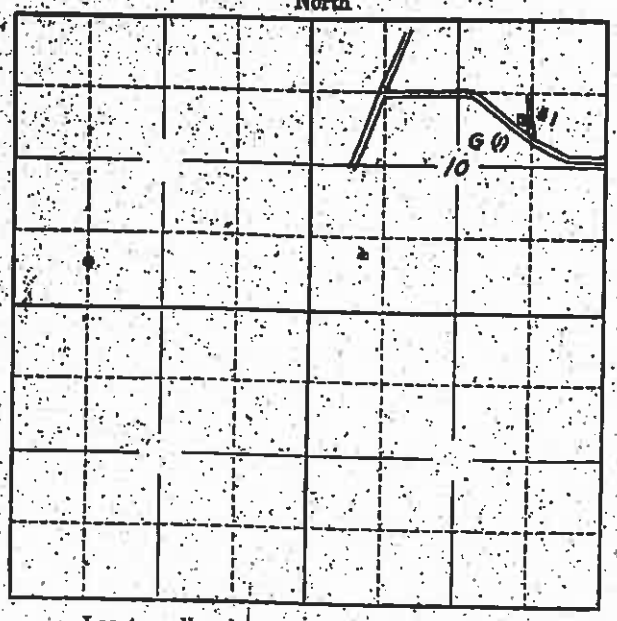
Township North or South	Range E. or W. of Willamette Meridian	Section	Forty-acre Tract	Number Acres To Be Irrigated	Date of Reclamation
6S	1W	10	N½	Municipal	1925
6S	1W	3	S½		1925

15. If the ground water supply is supplemental to an existing water supply, identification of any application for a permit, permit, certificate or adjudicated right to appropriate water made or held by the registrant

GR- 140 B

Township 6S Range 1W, W.M.

North



Locate well and acreage of irrigated land on plat.

Scale: 2" = 1 Mile

STATE OF OREGON
County of Oregon Marion } ss.

I, Bernard H. Kunel, being first duly sworn, do hereby certify that I have read the foregoing Registration Statement and that all of the items therein contained are true to the best of my knowledge and belief.

Bernard H. Kunel
Chairman Water Committee
(Signature of Registrant)

Subscribed and sworn to before me this 1st day of March, 1951.

My commission expires Sept. 8 1956

(Notary Public)

(SEAL)

See Page GR-140 G for
CERTIFICATE OF REGISTRATION

STATE OF OREGON
County of Marion } ss.

~~This is to certify that the foregoing Registration Statement was received in the office of the State Engineer on the ..... day of ..... 19..... and has been duly recorded in said office in Book No. ..... of Registration Statements on page .....~~

~~Construction shall be completed by ..... 19..... and the water completely applied to beneficial use by ..... 19.....~~

Witness my hand this ..... day of ....., 19....

(State Engineer)

By .....
(Deputy)

REGISTRATION NO. GR-146

Registration Statement CERTIFICATE NO. GR-140

OF CLAIMANT OF RIGHT TO APPROPRIATE GROUND WATER

(Under Chapter 708, Oregon Laws 1955.)

TO THE STATE ENGINEER OF OREGON:

I, City of Mt. Angel, Oregon

of Mt. Angel County of Marion

State of Oregon, do hereby make application for a certificate of registration as evidence of a right to appropriate ground water.

1. Source from which water is withdrawn is Pump well #2 (Flowing well, pump well, infiltration trench, or tunnel)

2. Location is: In City of Mt. Angel (Approximate distance and direction from nearest city or town)

and is more particularly described as follows:

(a) 1600 feet south and 1460 east from NW corner section 10, (Give distance and bearing to corner of section or other legal subdivision),

being within SE¼ of NW¼ (Smallest legal subdivision) of Sec. 10, Twp. 6 S (N. or S.), Rge. 1 W (E. or W.)

or (b) within limits of recorded platted property, town or city: Mt. Angel

in Lot 5, Block 1 of M. Bunalas Addition (Name of plat or addition)

Mt. Angel (If within city or town, give name) County of Marion

3. Construction Work was begun on 1938 (Date); was completed on 1938 (Date)

and the ground water claimed was first used for the purposes set out below on 1938 (Date)

since which time the water has been used continuously (Continuously or intermittently)

from 1938 (Date) to 1956 (Date)

4. Quantity of water claimed and used is 120 gallons per minute; _____ acre feet per year.

5. Purpose or Purposes for which water is used domestic, industrial and municipal

(Domestic, irrigation, municipal, manufacturing, industrial, etc.)

6. Description of Well: Depth 117 feet. Type drilled well (Dug or drilled)

diameter 12 inches. Elevation of ground at well site 160± (As near as known) feet, mean sea level.

Depth to water table 12 feet.

7. Capacity of Well: 100 g.p.m. with 60 feet drawdown.

120 g.p.m. with 71 feet drawdown.

Date of test February 15, 1956

If Flowing Well: Measured discharge _____ g.p.m. on _____ (Date)

Shut-in pressure at ground surface _____ lbs. per sq. in. on _____ (Date)

Water is controlled by _____ (Cap, valve, etc.)

GR-140 D

8. **Casing:** (Give diameter, commercial specifications and depth below ground surface of each casing size.)

12 inch diameter Standard Well Casing from Surface to 117 feet

_____ inch diameter _____ from _____ to _____ feet

_____ inch diameter _____ from _____ to _____ feet

_____ inch diameter _____ from _____ to _____ feet

Describe and show depth of shoe, plug, adapter, liner or other details: _____

9. **Perforated Casings or Screens:**

Unknown from 66 to 73
(Number per foot and size of perforations, or describe screen)

Unknown from 75 to 93

Unknown from 95 to 110

_____ from _____ to _____

10. **Log of Well:** (Describe each stratum or formation clearly, indicate if water bearing, and give thickness and depth as indicated.)

	MATERIAL	Thickness (Feet)	Depth to Bottom (Feet)
Surface to 18 ft.	Yellow Sand		
18 to 32 ft.	Blue Clay		
32 to 65 ft.	Cemented Gravel		
65 to 70 ft.	Loose Gravel		
70 to 87 ft.	Cemented Gravel		
87 to 88 ft.	Sand		
88 to 104 ft.	Cemented Gravel		
104 to 108 ft.	Loose Gravel		
108 to 117 ft.	Blue Clay		

GR- 140 E

11. **Infiltration Trench:** Covered or open _____

Dimensions: Length _____ ft. Minimum depth _____ ft. Maximum depth _____ ft.

Bottom width _____ ft. Discharge _____ g.p.m. Date of test _____

12. **Tunnel:** Type of lining _____

Dimensions: _____
(Length, course, and cross sectional size)

Position of water bearing stratum with reference to portal of tunnel _____

Log of tunnel: (Preceding table for log of well may be used, if desired. Give footage from portal and character of materials, as pertinent.)

13. **Pumping Equipment:**

(a) Pump Pomona (Turbine) Capacity 220 g.p.m.
(Make, type and size)

(b) Motor 20 HP General Electric
(Type and horsepower)

14. **Location of area irrigated or to be irrigated, or place of use if for purposes other than irrigation.**

Township North or South	Range E. or W. of Willamette Meridian	Section	Forty-acre Tract	Number Acres To Be Irrigated	Date of Reclamation
6S	1W	10	N½		1938
6S	1W	3	S¼		1938

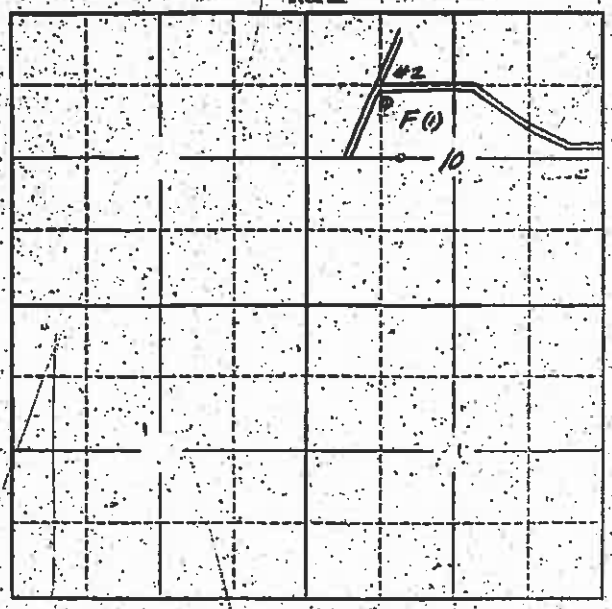
15. If the ground water supply is supplemental to an existing water supply, identification of any application for a permit, permit, certificate or adjudicated right to appropriate water made or held by the registrant.

_____

_____

GR- 140 F

Township 6S Range 1W, W.M.



Locate well and acreage of irrigated land on plat.

Scale: 2" — 1 Mile

STATE OF OREGON
County of Marion } ss.

I, Bernard H. Kirsch, being first duly sworn, do hereby certify that I have read the foregoing Registration Statement and that all of the items therein contained are true to the best of my knowledge and belief.

Bernard H. Kirsch
Chairman Water Committee
(Signature of Registrant)

Subscribed and sworn to before me this 21st day of March, 19 56

My commission expires [illegible]
(Notary Public)

(SEAL)

CERTIFICATE OF REGISTRATION

STATE OF OREGON
County of Marion } ss.

This is to certify that the foregoing Registration Statement was received in the office of the State Engineer on the 21st day of March, 19 56, at 8 o'clock A.M. and has been duly recorded in said office in Book No. 1 of Registration Statements on page GR-140 0

~~Construction shall be completed by ..... and the water completely applied to beneficial use by .....~~

Witness my hand this 8th day of October, 1956

Lewis A. Stanley
(State Engineer)

By
(Deputy)

Permit No. G- 296

APPLICATION FOR A PERMIT

To Appropriate the Ground Waters of the State of Oregon

I, City of Mt. Angel
(Name of applicant)

of Mt. Angel, county of Marion,
(Postoffice Address)

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

April 1, 1905

1. Give name of nearest stream to which the well, tunnel or other source of water development is situated [illegible] to the North and [illegible] Creek to the South
(Name of stream)

tributary of [illegible]

2. The amount of water which the applicant intends to apply to beneficial use is [illegible] cubic feet per second or [illegible] gallons per minute.

3. The use to which the water is to be applied is [illegible] for the City of [illegible]

[illegible] source is located [illegible] and [illegible] ft. [illegible] from the

[illegible]

[illegible] Twp. [illegible] R. [illegible]

[illegible] to be [illegible]

[illegible] Sec. [illegible] Twp.

[illegible] on the accompanying map

[illegible]

[illegible]

[illegible]

[illegible] and an estimated depth of [illegible] feet. It is [illegible]

[illegible] casing. Depth to water table [illegible]

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.; 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* _____ [illegible]

Give horsepower and type of motor or engine to be used

11. *If the location of the well, tunnel, or other development work is less than one-fourth mile from a* [illegible] *stream or stream channel, give the distance to the nearest point on each of such streams* [illegible] *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*

Name of Water Master	[illegible]	[illegible]
	[illegible]	"
	[illegible]	
	[illegible]	"
	[illegible]	"
	[illegible]	"
	[illegible]	"
	[illegible]	"
	[illegible]	"
	[illegible]	"
	[illegible]	"
	[illegible]	"
	[illegible]	"
	[illegible]	"
	[illegible]	"

(If more space required, attach separate sheet)

[illegible]

MUNICIPAL SUPPLY—

13. To supply the city of ..... Mt. Angel

in ..... Marion ..... *county, having a present population of* 1310

and an estimated population of ..... 2,500 ..... *in 19.* 75.

14. Estimated cost of proposed works, $.. [redacted] 30,000.00

15. Construction work will begin on or before April 1, 1954.

16. Construction work will be completed on or before April 1, 1955

17. The water will be completely applied to the proposed use on or before April 1, 1965

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. .....

Bernard H. Kirsch
(Signature of applicant)
Chairman, Water Committee

Remarks .....

Well #1 - 510'S & 50'W from SE cor. Blk 4, Butalus Add.
within SE4, NW4 Sec. 10, T.6 S., R.1 W.

Well #2 - 100'W & 305'N from NE cor. Blk 3 of original townsite
within SE4, SW4 Sec. 3, T.6 S., R.1 W.

[illegible] - [illegible] & 420'N from NE cor. Blk 4 of Palmers Add.
within NE4, NW4 Sec. 10, T.6 S., R.1 W.

[illegible] from the NW cor. Blk 10 of original [illegible]
within NW4, NW4 Sec. 10, T.6 S., R.1 W.

[illegible]

[illegible] I have examined the [illegible] together with the [illegible]
[illegible]

[illegible] this application must be returned to the State Engineer [illegible]
[illegible] on or before , 19

WITNESS my hand this day of 19

[illegible]

2M

STATE OF OREGON, } ss.
County of Marion. }

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 [illegible] 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 four wells.

The use to which this water is to be applied is municipal.

If for irrigation, this appropriation shall be limited to [illegible] 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 [illegible] 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 March 21, 1956.

Actual construction work shall begin on or before August 13, 1957 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 [illegible] day of August, 1956.

[illegible]
STATE ENGINEER

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 21st day of March, 1956 at 1:55 o'clock P. M.

Returned to applicant

Approved August 24, 1956

Recorded in book No. 2 of Ground Water Permits on page 2M

LEWIS A. STANLEY
STATE ENGINEER

Certificate Book No. [illegible] page [illegible]

BEFORE THE STATE ENGINEER OF OREGON

Marion County

IN THE MATTER OF APPLICATIONS FOR)
EXTENSIONS OF TIME TO COMPLETE)
CONSTRUCTION WORK AND APPLY THE)
WATER UNDER PERMITS ISSUED BY THE)
STATE ENGINEER_ _ _ _ _ _ _ _ _ _)

O R D E R

EXTENDING TIME LIMITS

The above entitled matter now coming on for the consideration of the State Engineer, and it appearing that:

The holders of the following water right permits issued by the State Engineer have submitted applications for extension of the time limits within which to complete the construction work and apply the water to beneficial use under their respective water right permits,

The State Engineer is authorized (ORS 537.230) to grant extension of time for good cause shown, within which to complete work or perfect a right under a water right permit,

The statements in the applications for extensions filed regarding completion of the projects represented, indicate that each has shown such reasonable diligence as entitles him to an extension of time, and

No protests or objections to the granting of an extension under any of the following permits have been filed by any subsequent permit holders,

IT IS THEREFORE ORDERED that extensions of time be and the same are hereby granted as follows:

NAME	APP. NO.	PERMIT NO.	TO COMPLETE WORK	TO APPLY WATER
Richard Renken & Sons	U-163	U-155		October 1, 1959
L. J. & Anne S. Horton	U-246	U-220	October 1, 1958	October 1, 1958
M. J. Vilsmeyer	U-367	U-346	October 1, 1958	October 1, 1958
Hubert Wagers	U-467	U-448	October 1, 1959	October 1, 1959
Laddie & Carl Rajnus	U-502	U-457	October 1, 1958	October 1, 1958
John Davis	U-523	U-475	October 1, 1958	October 1, 1958
Albert R. Devincenzi	U-453	U-486	October 1, 1959	October 1, 1959
M. M. McDole	U-548	U-500	October 1, 1958	October 1, 1958
Irwin J. Couch	U-564	U-517	October 1, 1958	October 1, 1958
Vivianne V. Williams	U-567	U-519	October 1, 1958	October 1, 1958
Waldo H. Cramer	U-600	U-551	October 1, 1959	October 1, 1959
G. S. Williams	U-555	U-562	October 1, 1958	October 1, 1958
John Hartzler	U-465	U-566	October 1, 1959	October 1, 1959

NAME	APP. NO.	PERMIT NO.	TO COMPLETE WORK	TO APPLY WATER
Earl A. & Alice Ranslam	U-667	U-598	October 1, 1958	October 1, 1958
Claude A. Shafer	U-704	U-635	October 1, 1959	October 1, 1959
Arthur B. Hann	U-772	U-689	October 1, 1958	October 1, 1958
Merritt Parks	U-773	U-690	October 1, 1959	October 1, 1959
Margaret Bailey Rea	U-775	U-691	October 1, 1958	October 1, 1958
Margaret Bailey Rea	U-776	U-692	October 1, 1958	October 1, 1958
Herman Paul Koehler	U-765	U-706	October 1, 1959	October 1, 1959
Charles W. Boley	U-796	U-712	October 1, 1958	October 1, 1958
Jamie F. Marsh	U-811	U-719	October 1, 1958	
E. A. Wing	U-822	U-727	October 1, 1958	October 1, 1958
Charles W. Boley	U-825	U-729	October 1, 1958	October 1, 1958
John W. & Angie B. Stark	U-869	U-756	October 1, 1958	
T. J. & Bessie Duhaime	G-93	G-16	October 1, 1958	
Charles A. Moss	G-98	G-18	October 1, 1958	October 1, 1958
Guy Hand	G-102	G-20	October 1, 1959	October 1, 1959
Sam & Vesta Nofziger	G-120	G-31	October 1, 1958	October 1, 1958
Frank D. Baird	G-129	G-35	October 1, 1958	October 1, 1958
Howard Beachler	G-154	G-56	October 1, 1958	October 1, 1958
Deloss M. Webb	G-111	G-73	October 1, 1958	October 1, 1958
Marshall W. & Dorothea M. Poole	G-138	G-76	October 1, 1959	October 1, 1959
Ben Smith	G-124	G-98	October 1, 1958	October 1, 1958
Henry Becker	G-152	G-101	October 1, 1958	October 1, 1958
Garth A. Ross	G-171	G-103	October 1, 1958	
R. J. Corbin	G-49	G-116	October 1, 1959	October 1, 1959
V. O. Z. Morgan	G-56	G-117	October 1, 1958	October 1, 1958
William J. Doherty	G-204	G-125	October 1, 1958	October 1, 1958
Alex & Iva A. Legler	G-210	G-129	October 1, 1958	October 1, 1958
W. O. White	G-230	G-142	October 1, 1958	October 1, 1958
John W. Rossberg	G-234	G-144	October 1, 1959	October 1, 1959
Ernest Roth	G-264	G-164	October 1, 1958	October 1, 1958
Duane C. Crane	G-57	G-180	October 1, 1958	October 1, 1958
Joe & Minnie A. Stitz	G-193	G-195	October 1, 1959	October 1, 1959
Clarence O. Braaten	G-328	G-218	October 1, 1958	October 1, 1958
John P. Fay	G-334	G-221	October 1, 1959	October 1, 1959
John P. Fay	G-335	G-222	October 1, 1959	October 1, 1959
A. W. Schneider	G-394	G-274	October 1, 1958	October 1, 1958
John Ransom	G-196	G-295	October 1, 1958	October 1, 1958
City of Mt. Angel	G-274	G-296	October 1, 1960	October 1, 1960
Budd Rogers	G-303	G-324	October 1, 1959	October 1, 1959
Harry J. Andrews	G-407	G-330	October 1, 1959	October 1, 1959
City of Bandon	R-5017	R-368	October 1, 1960	
Thompson Cr. Irr. Association	R-13846	R-697	October 1, 1959	
H. Douglas Whiteline	R-20521	R-801	October 1, 1959	
Pine Lakes Ditch & Reservoir Co.	R-25231	R-1098	October 1, 1958	
Hugh W. Jones	R-26218	R-1178	October 1, 1958	
Charles Stanley	R-27335	R-1460	October 1, 1958	
Vernon E. Puckett	R-27765	R-1499	October 1, 1958	
Stephen H. Ford	R-27753	R-1516	October 1, 1959	
Willard L. Smith	R-28738	R-1527	October 1, 1959	
Willard L. Smith	R-28739	R-1528	October 1, 1959	

NAME	APP. NO.	PERMIT NO.	TO COMPLETE WORK	TO APPLY WATER
Marie C. & Cora A. Carroll	R-28772	R-1561	October 1, 1958	
Edmund & Maxine Peile	R-28873	R-1564	October 1, 1959	
Neely E. Williams	R-28967	R-1595	October 1, 1958	
Hull Lumber Co., Inc.	R-29306	R-1651	October 1, 1958	
Jay McKay	R-29403	R-1667	October 1, 1957	
Jay McKay	R-29403	R-1667	October 1, 1958	
Walter H. & Bessie L. Welch	R-29436	R-1672	October 1, 1958	
Harley R. Carter & Raphael Gardener	R-30030	R-1716	October 1, 1959	
A. A. & Alvin Hurlburt	R-29764	R-1747	October 1, 1959	
North Unit Irr. Dist.	R-30129	R-1754	October 1, 1958	
A. V. Lusby	R-29447	R-1779	October 1, 1958	
Dan Carnegie	R-30130	R-1784	October 1, 1958	
Orville A. Young	R-30173	R-1787	October 1, 1958	
George J. Isadore	R-30201	R-1788	October 1, 1958	
A. Kermit Anderson	R-30482	R-1825	October 1, 1958	
Willamette Valley Water Co.	81	E-82	October 1, 1959	October 1, 1959
Meadows Drainage Dist.	488	309	October 1, 1958	October 1, 1958
Willamette Valley Water Co.	1508	1401	October 1, 1958	October 1, 1958
City of Bandon	4982	3011	October 1, 1960	October 1, 1960
Meadows Drainage Dist.	7535	4791	October 1, 1958	October 1, 1958
Eagle Point Irr. Dist.	8358	6396	October 1, 1959	October 1, 1959
Portland General Electric Co.	10715	8912	October 1, 1959	October 1, 1959
Corbett Water Dist.	15024	11882	October 1, 1960	October 1, 1960
Corbett Water Dist.	16229	12154	October 1, 1960	October 1, 1960
Thompson Creek Irrigation Association	14170	12361	October 1, 1959	October 1, 1959
A. R. & Brydal Sartain	18470	14081	October 1, 1959	October 1, 1959
H. Douglas Whiteline	20522	16023	October 1, 1959	October 1, 1959
City of Manzanita	21322	17073	October 1, 1958	October 1, 1958
Western Shoreways, Inc.	21896	17241	October 1, 1959	October 1, 1959
Rankin Crow	22441	17709		October 1, 1959
Rankin Crow	23471	18516		October 1, 1959
Astoria Golf and Country Club	24396	19148	October 1, 1958	October 1, 1958
City of Lafayette	20366	19164	October 1, 1959	October 1, 1959
Rankin Crow	23786	19175		October 1, 1959
Twin Rocks Water Dist.	24790	19530	October 1, 1958	October 1, 1958
Lacomb Irrigation Dist.	14466) 17705)	19629	October 1, 1959	October 1, 1959
Mack E. Brown	24903	19685	October 1, 1959	October 1, 1959
Pine Lakes Ditch & Reservoir Co.	25232	19962	October 1, 1958	October 1, 1958
Juno Water Co., Inc.	25347	19984	October 1, 1960	October 1, 1960
Kenneth J., Anne Steward & Bernard Bentz	25386	20215	October 1, 1958	October 1, 1958
Myrtle E. Harwood	25736	20261	October 1, 1959	October 1, 1959
Neil Moore	25904	20323	October 1, 1959	October 1, 1959
Hugh W. Jones	26219	20467	October 1, 1958	October 1, 1958
D. D. & Katherine L. Bump	24066	20472	October 1, 1958	October 1, 1958

NAME	APP. NO.	PERMIT NO.	TO COMPLETE WORK	TO APPLY WATER
William H. Dickman	26278	20625	October 1, 1959	October 1, 1959
Gerald & Dorothy Harris	26381	20770	October 1, 1959	October 1, 1959
Lewis & Elizabeth Birkland	26681	20890	October 1, 1958	October 1, 1958
Kauer Brothers	26819	21061	October 1, 1959	October 1, 1959
Gail Winiford	26824	21066	October 1, 1958	October 1, 1958
J. L. Helms	26994	21203	October 1, 1958	October 1, 1958
Earl Peffley	27158	21359	October 1, 1958	October 1, 1958
F. A. Nichols	27217	21401	October 1, 1959	October 1, 1959
Anna G. Sika	27225	21420	.	October 1, 1958
Veronica Kuschnick	27342	21530	October 1, 1957	October 1, 1957
Alven J. Cissel	24887	21654	October 1, 1959	October 1, 1959
Johnson Stock Co.	27677	21792	October 1, 1957	October 1, 1958
J. P. McAuliffe	27772	21863	October 1, 1958	October 1, 1958
Lester M. & Belva Johnson	27834	21894	October 1, 1958	October 1, 1958
Virginia Menefee	26479	21922		October 1, 1958
Charles Stanley	27336	21934	October 1, 1958	October 1, 1958
M. A. Jones	27764	21948	October 1, 1958	October 1, 1958
George Shroyer	27926	21995	October 1, 1958	October 1, 1958
A. C. & Clara Jackson	28031	22055	October 1, 1958	October 1, 1958
K. N. Spencer	28143	22149		October 1, 1958
Mary E. Pranger	28314	22262	October 1, 1958	October 1, 1958
Alfred & Eileen St. Clair & J. E. & Vivian St. Clair	28478	22303		October 1, 1958
Vernon E. Puckett	27321	22344	October 1, 1958	October 1, 1958
Sidney Newton	28200	22352		October 1, 1958
Stephen H. Ford	27754	22424	October 1, 1959	October 1, 1959
Willard L. Smith	28740	22469	October 1, 1959	October 1, 1959
Marue C. & Cora A. Carroll	27267	22555	October 1, 1958	October 1, 1958
Edmund & Maxine Peile	28874	22629	October 1, 1959	October 1, 1959
John A. Payton, Mrs. J.E. Spurlock & W.A. Payton, Estate	28656	22632	October 1, 1959	October 1, 1959
Harrison L. Smith	28974	22725		October 1, 1958
Ellis J. Wyland	28947	22769		October 1, 1958
Neely E. Williams	28968	22782	October 1, 1958	October 1, 1958
Joe W. Jarvis	28987	22791		October 1, 1958
C. R. Yunker	28047	22810		October 1, 1958
Elbridge G. Sullivan	28837	22821		October 1, 1958
Fred G., Cecil M., Grant F, & Lois M. Brown	28909	22823		October 1, 1958
George D. White	29093	22873		October 1, 1958
Dan F. Haas	26614	22885	October 1, 1959	October 1, 1959
Scio Water Improvement District	28839	22902		October 1, 1958
Manton A. Carl	29075	22913		October 1, 1958
Fred N. Williamson	29179	22943	October 1, 1958	October 1, 1958
Fred N. Williamson	29180	22944	October 1, 1958	October 1, 1958
Malcolm H. Armour	28846	22971		October 1, 1959
Shorewood Water Corp.	29166	22987		October 1, 1960
Norman L. Rice	29292	23026		October 1, 1958
D. R. Luper	29300	23030	October 1, 1958	October 1, 1958
Lennie Haldorson	29431	23037		October 1, 1959
Dayton O. Williams	25628	23046		October 1, 1959
Hull Lumber Co., Inc.	29307	23082	October 1, 1958	October 1, 1958
Eugene L. Kirkham	29320	23089	October 1, 1958	October 1, 1958
Ira V. Woolfolk	29222	23116		October 1, 1958

NAME	APP. NO.	PERMIT NO,	TO COMPLETE WORK	TO APPLY WATER
Glenn M. Fixsen	29254	23121		October 1, 1958
L. G. Dawson	29294	23123	October 1, 1958	October 1, 1958
D. D. & Katherine L. Bump	29323	23125	October 1, 1958	October 1, 1958
Stanley Duane & Donna Carol Ego	29349	23128		October 1, 1958
G. E. & Ann Smith	29399	23157		October 1, 1958
Jay McKay	29404	23159	October 1, 1957	
Jay McKay	29404	23159	October 1, 1958	October 1, 1958
Thelma C. Heilmeyer	29428	23172		October 1, 1958
Harold F. & Leona C. Lindell & Lester Lindell	29430	23174		October 1, 1959
Walter H. & Bessie L. Welch	29437	23175	October 1, 1958	October 1, 1958
Lewis Halvorsen	29466	23189		October 1, 1959
J. Wesley Webb	29393	23217		October 1, 1959
Clifford Dickson	28341	23228	October 1, 1958	October 1, 1958
Ben C. Gerwick	28949	23230		October 1, 1959
Milton Box Co.	28697	23263	October 1, 1959	October 1, 1959
Ervin E. Briscoe	29542	23278	October 1, 1958	October 1, 1958
Wayne D. & Theresa E. Ransom	29556	23284	October 1, 1959	October 1, 1959
S. E. Hansen	29630	23341	October 1, 1958	October 1, 1958
Wesley Thomas	29652	23351	October 1, 1958	October 1, 1958
Meadows Drainage Dist.	29718	23396	October 1, 1959	October 1, 1959
W. D. Pollock	29819	23416	October 1, 1958	October 1, 1958
Harley R. Carter & Raphael Gardener	30031	23418	October 1, 1959	October 1, 1959
Puckett & Scherer	29744	23429	October 1, 1958	October 1, 1958
Rex W. & Zella G. Ziegler	29829	23461	October 1, 1958	October 1, 1958
A. A. & Alvin Hurlburt	27927	23572	October 1, 1959	October 1, 1959
Harold H. Hursh	29954	23598	October 1, 1958	October 1, 1958
Roy H. Cork	29964	23605	October 1, 1958	October 1, 1958
A. C. Pieróe	29975	23612	October 1, 1958	October 1, 1958
Alvin L. & Dorothy L. Anderson	30006	23631	October 1, 1958	
F. A. J. de Haan	29435	23671	October 1, 1958	October 1, 1958
C. E. Palmer	30071	23701	October 1, 1959	October 1, 1959
Ira G. Parish	30181	23719	October 1, 1958	October 1, 1958
M. H. & Julia M. Pingle	30292	23728	October 1, 1959	October 1, 1959
Marshall W. & Dorothea M. Poole & Robert Moisio	30319	23733	October 1, 1959	October 1, 1959
A. V. Lusby	29338	23749	October 1, 1958	October 1, 1958
Dan Carnegie	30131	23777	October 1, 1958	
Joe H. Hanby	30137	23781	October 1, 1958	October 1, 1958
A. J. & Anna Chartraw	30153	23791	October 1, 1958	October 1, 1958
Orville A. Young	30174	23798	October 1, 1958	October 1, 1958
George J. Isadore	30202	23799	October 1, 1958	October 1, 1958
Everett & Evaline Hendrickson	29072	23803	October 1, 1958	October 1, 1958
Margaret F. Lachmund	30208	23818	October 1, 1958	October 1, 1958
W. H. R. Nostrand	30228	23830	October 1, 1958	
George C. West	30298	23855	October 1, 1958	October 1, 1958
George C. West	30299	23856	October 1, 1958	October 1, 1958
Leo L. & Clara C. Flower	30342	23868	October 1, 1959	October 1, 1959
Lee & Everett Ulm	30346	23870	October 1, 1958	October 1, 1958
Eugene D. Hargis	30400	23889	October 1, 1959	October 1, 1959
Lester J. & Mildred Messal	30444	23906	October 1, 1958	October 1, 1958

NAME	APP. NO.	PERMIT NO.	TO COMPLETE WORK	TO APPLY WATER
Marguerite K. & Robert C. Nelson	27931	23915	October 1, 1958	October 1, 1958
William R. McCormack	28024	23916	October 1, 1958	October 1, 1958
Carey W. Foster	30157	23962	October 1, 1959	October 1, 1959
Andrew Kermit Anderson	30256	23968	October 1, 1958	October 1, 1958
Mayfred Spencer Parkhurst	30415	23982	October 1, 1958	October 1, 1958
Frank J. Kosmalski	30418	23983	October 1, 1958	October 1, 1958
Corvallis Country Club	30451	23988	October 1, 1958	October 1, 1958
Byron Coleman By S.E.Hansen	30465	23996	October 1, 1958	October 1, 1958
R. W. Ryan	30468	23998	October 1, 1958	October 1, 1958
Raymond E. & Lillian M. Amy	30469	23999	October 1, 1958	
E. Earl McCarty	30513	24024	October 1, 1958	October 1, 1958
Harry Fluke	30538	24045	October 1, 1958	October 1, 1958
Earl H. Dorhrman	30546	24051	October 1, 1958	October 1, 1958
City of Madras	24965	24488	October 1, 1960	October 1, 1960

Dated at Salem, Oregon, this 24th day of March, 1958.

Lewis A. Stanley

LEWIS A. STANLEY
State Engineer

STATE OF OREGON

COUNTY OF MARION

CERTIFICATE OF WATER RIGHT

This Is to Certify, *That* CITY OF MT. ANGEL

of Mt. Angel *, 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* one well

a tributary of Abiqua Creek (Pudding River) *for the purpose of* municipal

under Permit No. G-296 *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* March 21, 1956

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 SE¼ NW¼, Section 10, 6 S., R. 1 W., W. M. Well located 525 ft. North and 2362 ft. East from West quarter section corner of Section 10

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:

Municipal
S½ SW¼
Section 3
NE¼ NE¼
Lot 1 (NW¼ NE¼)
NW¼ NE¼ as projected within Cleaver DLC #51
Lot 2 (SW¼ NE¼)
SW¼ NE¼ as projected within Cleaver DLC #51
SE¼ NE¼
NW¼
NE¼ SW¼
Both as projected within Cleaver DLC #51
N½ SE¼
As projected within Cleaver DLC #51
Section 10
T. 6 S., R. 1 W., 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. March 31, 1965

CHRIS L. WHEELER
State Engineer

Recorded in State Record of Water Right Certificates, Volume 24 *, page* 32004

Permit No. G- 2190

APPLICATION FOR A PERMIT

To Appropriate the Ground Waters of the State of Oregon

I, City of Mt. Angel (Name of applicant)

of Mt.Angel (Post Office Address), county of Marion

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

April 3, 1893

1. Give name of nearest stream to which the well, tunnel or other source of water development is situated Zollner Creek to the North and Abiqua Creek to the South (Name of stream) tributary of Pudding River

2. The amount of water which the applicant intends to apply to beneficial use is ——— cubic feet per second or 800 gallons per minute.

3. The use to which the water is to be applied is Municipal use for the City of Mt.Angel

4. The well or other source is located ft. (n or s) and ft. (e or w) from the corner of The Well is S. 76° 19' W. 924.00 feet from the most Northerly Northwest corner (Section or subdivision) of the Benjamin Cleaver Donation Land Claim No. 51, in Township 6 South, Range 1 West of the Willamette Meridian, Marion County Oregon (If probable, give distance and bearing to nearest corner) (If there is more than one "well" each must be described. Use separate sheet if necessary.) being within the Northeast ¼ of the Northwest ¼ of Sec. 10, Twp. 6 S., R. 1W, W. M., in the county of Marion.

5. The (Canal or pipe line) to be miles in length, terminating in the (Specified 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 Mt.Angel Municipal Water System

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.

None

8. The development will consist of one well (Give number of wells, tunnels, etc.) having a diameter of 12" for 296' 10" from 296' to 631 feet, and an estimated depth of 631' feet. It is estimated that feet of the well will require steel (Kind) casing. Depth to water table is estimated 2 (Feet)

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 . . . . . 6" gal. Centrifugal . . . . . .

Give horsepower and type of motor or engine to be used 9. H. [illegible]

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 . . . . . .

12. Location of area to be irrigated, or place of use . . . . . .

Township N. or S.	Range E. or W. of [illegible]	Section	Forty-acre Tract	Number Acres To Be Irrigated
5 S.	1 W.	3	SW¼, SW¼ SE¼, SE¼	[illegible]
		4	SE¼, SE¼	
		7	[illegible] [illegible]	
		10	[illegible], [illegible],	
			[illegible], [illegible]	
			SW¼, [illegible] SE¼, [illegible]	
			[illegible], [illegible] [illegible], [illegible]	
			SW¼, [illegible] SE¼, [illegible]	
			[illegible] SW¼ [illegible] SE¼	
			NW¼, SE¼ [illegible], SW¼	

(If more space required, attach separate sheet)

Character of soil . . . . . .

Kind of crops raised . . . . . .

MUNICIPAL SUPPLY—

2190

13. To supply the city of Mt. Angel

in Marion county, having a present population of 1535

and an estimated population of 2500 in 19 75

ANSWER QUESTIONS 14, 15, 16, 17 AND 18 IN ALL CASES

14. Estimated cost of proposed works, $ 20,000.00

15. Construction work will begin on or before Feb. 1962

16. Construction work will be completed on or before August 1, 1962

17. The water will be completely applied to the proposed use on or before August 1962

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.

Elmer F. Schaeber (Recorder)
(Signature of applicant)

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

STATE OF OREGON, } ss. PERMIT

County of Marion,

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 1.33 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 a well

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 July 10, 1962

Actual construction work shall begin on or before August 27, 1963 and shall thereafter be prosecuted with reasonable diligence and be completed on or before October 1, 19 63

Complete application of the water to the proposed use shall be made on or before October 1, 19 64

WITNESS my hand this 27th day of August, 19 62

Chris L. Wheeler
STATE ENGINEER

Application No. G- 2380

Permit No. G- 2193

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 10th day of July, 19 62, at 3:40 o'clock P. M.

Returned to applicant:

Approved:

August 27, 1962

Recorded in book No. 9 of Ground Water Permits on page 2190

CHRIS L. WHEELER STATE ENGINEER

Drainage Basin No. 2 page 96N

Permit A—GM—8-64 GP-12897-119

STATE OF OREGON

COUNTY OF MARION

CERTIFICATE OF WATER RIGHT

This Is to Certify, *That* CITY OF MT. ANGEL

of Mt. Angel *, 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* a well

a tributary of Zollner Creek (Pudding River) *for the purpose of* municipal

under Permit No. G-2190 *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 10, 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 1.33 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 NE¼ NW¼ as projected within Cleaver DLC 51, Section 10, T. 6 S., R. 1 W., W. M. Well located S. 76° 18' W. 924 feet from the most northerly NE corner of the Benjamin Cleaver DLC No. 51.

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:

S½ SW¼
Section 3
SE¼ SE¼
Section 4
E½ NE¼
Section 9
N½
N½ SW¼
N½ SSE¼
Section 10
T. 6 S., R. 1 W., 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. May 24, 1965

CHRIS L. WHEELER
State Engineer

Recorded in State Record of Water Right Certificates, Volume 24 *, page* 32220

CERTIFICATE NO. 36359

Permit No. G- G 6094

APPLICATION FOR A PERMIT

To Appropriate the Ground Waters of the State of Oregon

I, City of Mt. Angel
(Name of applicant)

of P. O. Box 105, county of Marion,
(Postoffice Address)

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

Feb. 9, 1905, Office of the Corporation Commissioner - State of Oregon

1. *Give name of nearest stream to which the well, tunnel or other source of water development is situated* Pudding River
(Name of stream)

tributary of Willamette

2. *The amount of water which the applicant intends to apply to beneficial use is* 1.33 *cubic feet per second or* 600 *gallons per minute.*

3. *The use to which the water is to be applied is* ~~Domest~~ Municipal

4. *The well or other source is located* ..... *ft.* ..... (N. or S.) *and* ..... *ft.* ..... (E. or W.) *from the* ..... *corner of* S 37° 33' W, 1716.70 From the Section Corner Common to Sec. 2,3,10 & 11
(Section or subdivision)

(If practicable, 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 NE 1/4 NE 1/4 *of Sec.* 10, *Twp.* 6 S, *R.* 1 W, *W. M., in the county of* Marion

5. *The* See Map (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* Alder Street Well

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* A well (Give number of wells, tunnels, etc.) *having a diameter of* 12" to 8" to *inches and an estimated depth of* 650' *feet. It is estimated that* 139 *feet of the well will require* steel (Kind) *casing. Depth to water table is estimated* 90 (Feet)

G1—5M

13004

G 6094

CANAL SYSTEM OR PIPE LINE— SEE MAP

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* Pump has not been selected. Will be 100 to 125 HP, 600 gpm

Give horsepower and type of motor or engine to be used 100-125 HP, 480 Volt, 3 Phase 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*

.....

.....

.....

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
	SEE EXHIBIT "A" ATTACHED			

(If more space required, attach separate sheet)

Character of soil .....

Kind of crops raised .....

G 6094

City of Mt. Angel, Oregon
Water Right Application
Number G-6817
February, 1975

EXHIBIT "A"

Township	Range	Section	Forty-Acre Tract	Number of Acres
6 S	1 W	2	SW NW	40
			SE NW	40
			NW SW	40
			NE SW	40
			SW SW	40
			SE SW	40
				240 Acres
6 S	1 W	3	SW NW	40
			SE NW	40
			SW NE	40
			SE NE	40
			NW SW	40
			NE SW	40
			NW SE	40
			NE SE	40
			SW SW	40
			SE SW	40
			SW SE	40
			SE SE	40
				480 Acres
6 S	1 W	4	SW NE	40
			SE NE	40
			NW SE	40
			NE SE	40
			SW SE	40
			SE SE	40
				240 Acres
6 S	1 W	9	NW NE	40
			NE NE	40
			SW NE	40
			SE NE	40
			NW SE	40
			NE SE	40
			SW SE	40
			SE SE	40
				320
6 S	1 W	10	Entire Section	640 Acres
6 S	1 W	11	NW NW	40
			NE NW	40
			SW NW	40
			SE NW	40
			NW SW	40
			NE SW	40
			SW SW	40
			SE SW	40
				320 Acres

TOTAL ACRES 2,240

G 6094

MUNICIPAL SUPPLY—

13. *To supply the city of* Mt. Angel

in Marion *county, having a present population of* 2,480

and an estimated population of 3,000 *in 19*90

ANSWER QUESTIONS 14, 15, 16, 17 AND 18 IN ALL CASES

14. *Estimated cost of proposed works,* $ 45,000

15. *Construction work will begin on or before* June 1974

16. *Construction work will be completed on or before* July 15, 1975

17. *The water will be completely applied to the proposed use on or before* October 30, 1977

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.* Earlier Permits filed with State Engineers Office

M S Bontrup 2/18/75
City Engineer
(Signature of applicant)

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

G 6094

STATE OF OREGON, } ss.
County of Marion,

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 1.34 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 a well

The use to which this water is to be applied is municipal purposes

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 February 18, 1975

Actual construction work shall begin on or before December 22, 1976 and shall thereafter be prosecuted with reasonable diligence and be completed on or before October 1, 1977

Complete application of the water to the proposed use shall be made on or before October 1, 1978

WITNESS my hand this 22nd day of December, 1975

WATER RESOURCES DIRECTOR

Application No. G-6817

Permit No. G-G 6094

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 18 day of February, 1975, at 8:10 o'clock A. M.

Returned to applicant:

Approved:

Recorded in book No. ..... of Ground Water Permits on page G 6094

STATE ENGINEER

Drainage Basin No. 2 page 110

Fee: $30.00

690-10-GBC

STATE OF OREGON

COUNTY OF MARION

CERTIFICATE OF WATER RIGHT

This is to certify, *That* CITY OF MT. ANGEL

of PO Box 105, Mt. Angel, *State of* OR 97362, *has made proof to the satisfaction of the Water Resources Director, of a right to the use of the waters of* a well

a tributary of Abiqua Creek *for the purpose of* municipal purposes

under Permit No. G-6094 *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* February 18, 1975
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 1.2 cubic feet per second

or its equivalent in case of rotation, measured at the point of diversion from the well. The well is located in the SE 1/4 NE 1/4, Section 10, T6S, R1W, WM; South 37 degrees 33 minutes West 1717 feet from the NE corner Section 10.

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:

SW 1/4
W 1/2 SE 1/4
SE 1/4 SE 1/4
Section 3

E 1/2 SE 1/4
Section 4

E 1/2 NE 1/4
NE 1/4 SE 1/4
Section 9

N 1/2
N 1/2 S 1/2
Section 10

Township 6 South, Range 1 West, WM

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 Water Resources Director, affixed this date. June 3, 1987

/s/ William H. Young
Water Resources Director

Recorded in State Record of Water Right Certificates, Volume 51 *, page* 56259

9676D/SB
G-6817

T 17651

STATE OF OREGON

COUNTY OF MARION

PERMIT TO APPROPRIATE THE PUBLIC WATERS

THIS PERMIT IS HEREBY ISSUED TO

CITY OF MOUNT ANGEL
ROBERTA HUDDLESTON
P.O. BOX 960 PHONE: (503)845-9291
MOUNT ANGEL, OREGON 97362

The specific limits and conditions of the use are listed below.

APPLICATION FILE NUMBER: G-14768

SOURCE OF WATER: WELL 6 IN THE WALKER DITCH BASIN

PURPOSE OR USE: MUNICIPAL USE

MAXIMUM RATE: 2.12 CUBIC FEET PER SECOND

PERIOD OF USE: YEAR ROUND

DATE OF PRIORITY: JUNE 8, 1998

POINT OF DIVERSION LOCATION: SW 1/4 SE 1/4, SECTION 9, T6S, R1W, W.M.; 720 FEET NORTH & 1770 FEET WEST FROM SE CORNER, SECTION 9

THE PLACE OF USE IS LOCATED AS FOLLOWS:

WITHIN THE SERVICE BOUNDARY OF THE CITY OF MT. ANGEL

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.

If substantial interference with a senior water right occurs due to withdrawal of water from any well listed on this permit, then use of water from the well(s) shall be discontinued or reduced and/or the schedule of withdrawal shall be regulated until or unless the Department approves or implements an alternative administrative action to mitigate the interference. The Department encourages junior and senior appropriators to jointly develop plans to mitigate interferences.

In the event of a request for a change in point of appropriation, an additional point of appropriation or alteration of the appropriation facility associated with this authorized diversion, the quantity of water allowed herein, together with any other right, shall not exceed the capacity of the facility at the time of perfection of this right.

Within 2 years of permit issuance, the permittee shall submit a water management and conservation plan consistent with OAR Chapter 690, Division 86.

(1) Use of water from the well, as allowed herein, shall be controlled or shut off if the well displays:

(a) An average water level decline of three or more feet per year for five consecutive years; or 2.5 ft/yr.

(b) A total water level decline of fifteen or more feet; or 34.1 ft.

(c) A hydraulic interference decline of fifteen or more feet in any neighboring well providing water for senior exempt uses or wells covered by prior rights.

(2) The water user shall install a meter or other measuring device suitable to the Director, and shall submit an annual report of water used to the Department by December 1 of each year.

(3) The permittee/appropriator shall be responsible for complying with each of the following requirements for measuring water levels in the well.

(a) Use of water from a new well shall not begin until an initial static water level in the well has been measured and submitted to the Department.

(b) In addition to the measurement required in subsection (a) of this section, a water level measurement shall be made each year during the period March 1 through March 31.

(c) All water level measurements shall be made by a qualified individual. Qualified individuals are certified water rights examiners, registered geologists, registered professional engineers, licensed land surveyors, licensed water well constructor, licensed pump installer, or the permittee/appropriator.

(d) Any qualified individual measuring a well shall use standard methods of procedure and equipment designed for the purpose of well measurement. The equipment used shall be well suited to the conditions of construction at the well. A list of standard methods of procedure and suitable equipment shall be available from the Department.

(e) The permittee/appropriator shall submit a record of the measurement to the Department on a form available from the Department. The record of measurement shall include both measurements and calculations, shall include a certification as to their accuracy signed by the individual making the measurements, and shall be submitted to the Department within 90 days from the date of measurement. The Department shall determine when any of the declines cited in section (1) are evidenced by the well measurement required in section (3).

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.

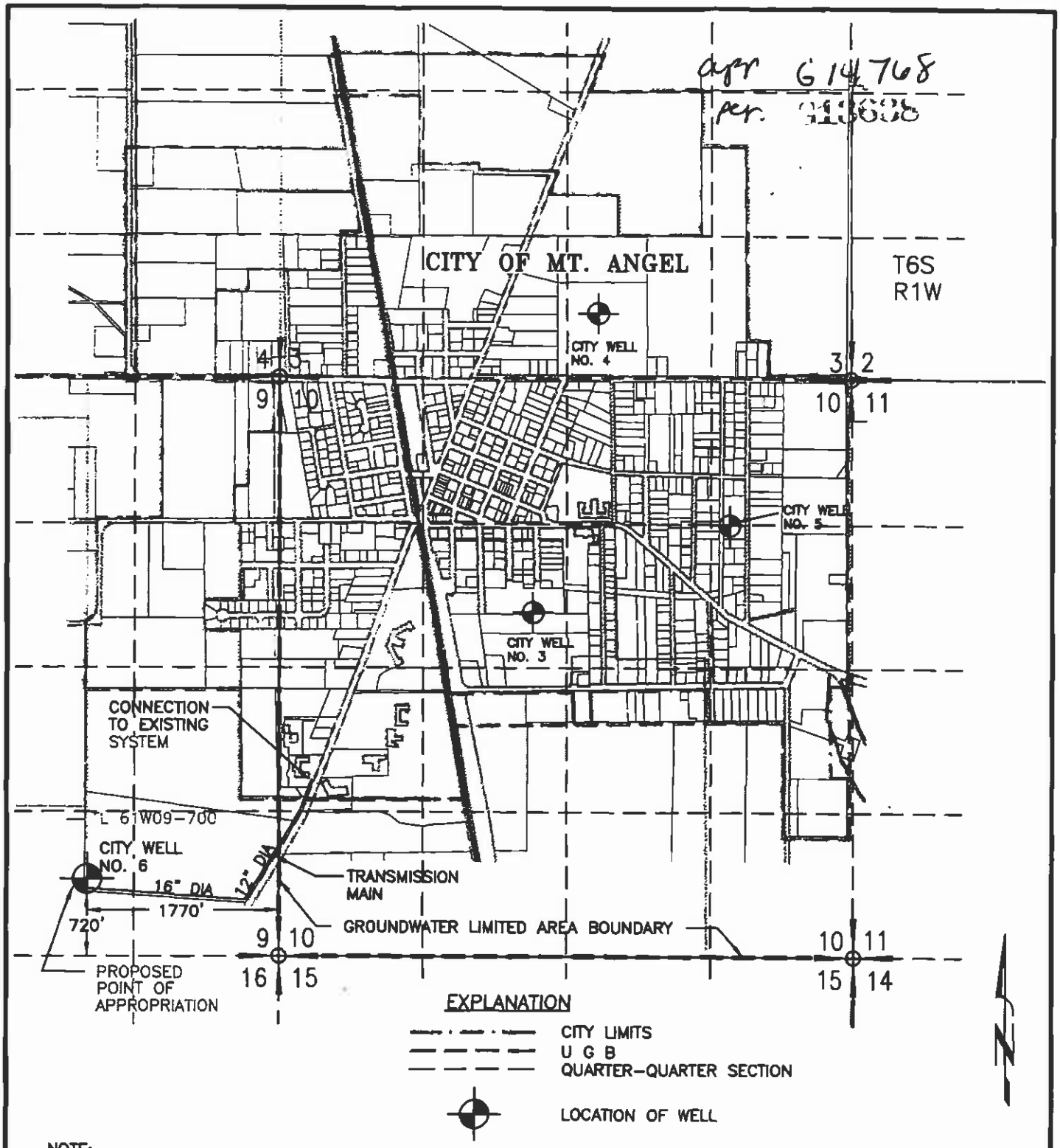
The Director finds that the proposed use(s) of water described by this permit, as conditioned, will not impair or be detrimental to the public interest.

Actual construction of the well shall begin by April 23, 2000. Complete application of water to the use shall be made on or before October 1, 2003. Within one year after complete application of water to the proposed use, the permittee shall submit a claim of beneficial use, which includes a map and report, prepared by a Certified Water Rights Examiner (CWRE).

Issued April 23, 1999

Dwight Fredl for

Martha O. Pagel, Director
Water Resources Department



NOTE:
THIS MAP WAS PREPARED FOR THE PURPOSE OF IDENTIFYING THE LOCATION OF WATER RIGHT ONLY AND IS NOT INTENDED TO PROVIDE LEGAL DIMENSIONS OR LOCATIONS OF PROPERTY OWNERSHIP LINES.

TOWNSHIP 6 SOUTH, RANGE 1 WEST, W.M.

1320' 0' 1320' 2640'

SCALE: 1" = 1320'

DAVID J. NEWTON ASSOCIATES, INC.
CIVIL & GEOLOGICAL ENGINEERING SERVICES
1201 S.W. 12TH AVENUE, SUITE 400
PORTLAND, OREGON 97205
(503) 228-7718
FAX (503) 228-7781

APPLICATION FOR A PERMIT TO USE GROUNDWATER - CITY WELL NO. 6

DATE	FILE NAME	INITIALS	PROJECT NO.		FIGURE
NOV. 1998	NEWRIGHT	TIW	322-113	CITY OF MT. ANGEL, OREGON	

Oregon
Theodore R. Kulongoski, Governor

Water Resources Department
North Mall Office Building
725 Summer Street NE, Suite A
Salem, OR 97301-1266
503-986-0900
FAX 503-986-0904

July 26, 2005

CITY OF MT ANGEL
P O BOX 960
MT ANGEL OR 97362

Reference: Transfer 7651

The above transfer application was rejected in the records of the Water Resources Department on July 25, 2005, by Special Order Volume 65, Page 440.

The application is no further force or effect.

If you have any questions, please contact the Transfer Section at (503)986-0886.

Sincerely,

Sarah Henderson

for Doug Parrow
Natural Resource Specialist

DP:sh

cc: Watermaster #16
David Newton, CWRE

Enclosure

BEFORE THE WATER RESOURCES DEPARTMENT
OF THE
STATE OF OREGON

In the Matter of Transfer Application	)	
T-7651, Marion County	)	FINAL ORDER
	)	

ORS 537.705 and 540.505 to 540.580 establish the process in which a water right holder may submit a request to transfer the point of appropriation, place of use, or character of use authorized under an existing water right. OAR Chapter 690, Division 380 implements the statutes and provides the Department's procedures and criteria for evaluating transfer applications.

Applicant

CITY OF MT ANGEL
P O BOX 960
MT ANGEL OR 97362

Findings of Fact

1. City Of Mt Angel filed an application to transfer the point of appropriation under Certificates 32004 and 56259. The Department assigned the application number T-7651.

2. The first right to be transferred is as follows:

   Certificate: 32004 in the name of CITY OF MT ANGEL (perfected under Permit G-296)
   Use: MUNICIPAL USE
   Priority Date: MARCH 21, 1956
   Rate: 1.0 CUBIC FOOT PER SECOND
   Source: A WELL in the ABIQUA CREEK BASIN

Authorized Point of Appropriation:

Twp	Rng	Mer	Sec	Q-Q	Survey Coordinates
6 S	1 W	WM	10	SE NW	525 FEET NORTH AND 2362 FEET EAST FROM THE W1/4 CORNER OF SECTION 10

Authorized Place of Use:

Twp	Rng	Mer	Sec	Q-Q	DLC
6 S	1 W	WM	3	SW SW	
6 S	1 W	WM	3	SE SW	
6 S	1 W	WM	10	NE NE	
6 S	1 W	WM	10	NW NE	
6 S	1 W	WM	10	NW NE	51

This is a final order in other than contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137-004-080 and OAR 690-01-005 you may either petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.

Twp	Rng	Mer	Sec	Q-Q	DLC
6 S	1 W	WM	10	SW NE	
6 S	1 W	WM	10	SW NE	51
6 S	1 W	WM	10	SE NE	
6 S	1 W	WM	10	NE NW	51
6 S	1 W	WM	10	NW NW	51
6 S	1 W	WM	10	SW NW	51
6 S	1 W	WM	10	SE NW	51
6 S	1 W	WM	10	NE SW	51
6 S	1 W	WM	10	NE SE	51
6 S	1 W	WM	10	NW SE	51

3. The second right to be transferred is as follows:

Certificate: 56259 in the name of CITY OF MOUNT ANGEL (perfected under Permit G-6094)
Use: MUNICIPAL USE
Priority Date: FEBRUARY 18, 1975
Rate: 1.2 CUBIC FEET PER SECOND
Source: A WELL in the ABIQUA CREEK BASIN

Authorized Point of Appropriation:

Twp	Rng	Mer	Sec	Q-Q	Survey Coordinates
6 S	1 W	WM	10	SE NE	SOUTH 37 ° 33 ' WEST 1717 FEET FROM THE NE CORNER OF SECTION 10

Authorized Place of Use:

Twp	Rng	Mer	Sec	Q-Q
6 S	1 W	WM	3	NE SW
6 S	1 W	WM	3	NW SW
6 S	1 W	WM	3	SW SW
6 S	1 W	WM	3	SE SW
6 S	1 W	WM	3	NW SE
6 S	1 W	WM	3	SW SE
6 S	1 W	WM	3	SE SE
6 S	1 W	WM	4	NE SE
6 S	1 W	WM	4	SE SE
6 S	1 W	WM	9	NE NE
6 S	1 W	WM	9	SE NE
6 S	1 W	WM	9	NE SE
6 S	1 W	WM	10	NE NE
6 S	1 W	WM	10	NW NE
6 S	1 W	WM	10	SW NE
6 S	1 W	WM	10	SE NE
6 S	1 W	WM	10	NE NW
6 S	1 W	WM	10	NW NW
6 S	1 W	WM	10	SW NW
6 S	1 W	WM	10	SE NW
6 S	1 W	WM	10	NE SW
6 S	1 W	WM	10	NW SW
6 S	1 W	WM	10	NE SE

Twp	Rng	Mer	Sec	Q-Q
6 S	1 W	WM	10	NW SE

4. Application T-7651 proposes to move the authorized point of appropriation approximately 2.5 miles from the existing points of appropriation to:

Twp	Rng	Mer	Sec	Q-Q	Survey Coordinates
6 S	1 W	WM	9	SW SE	APPROXIMATELY 725 FEET NORTH AND 1650 FEET WEST OF THE SE CORNER OF SECTION 9.

5. Notice of the application for transfer was published pursuant to ORS 540.520 and OAR 690-380-4000. No comments were filed in response to the notice.

6. Water has been used within the last five years according to the terms and conditions of the rights, and no evidence is available that would demonstrate that the rights are subject to forfeiture under ORS 540.610.

7. A pump, pipeline, and sprinkler system sufficient to use the full amount of water allowed under the existing right is present.

8. The proposed point of appropriation receives water from a different aquifer than the authorized points of appropriation.

9. The proposed change would result in enlargement of the right.

10. The proposed change would result in injury to other water rights.

11. On April 15, 2005, the Department issued a Preliminary Determination proposing to reject the proposed change. Notice of issuance of the Preliminary Determination was published in the Department's Public Notice of Water Use Requests on April 19, 2005. The applicant did not protest the Preliminary Determination.

Conclusions of Law

The proposed change in point of appropriation in application T-7651 is **not** to be consistent with the requirements of ORS 537.705, 540.505 to 540.580, and OAR 690-380-5000.

Now, therefore, it is ORDERED:

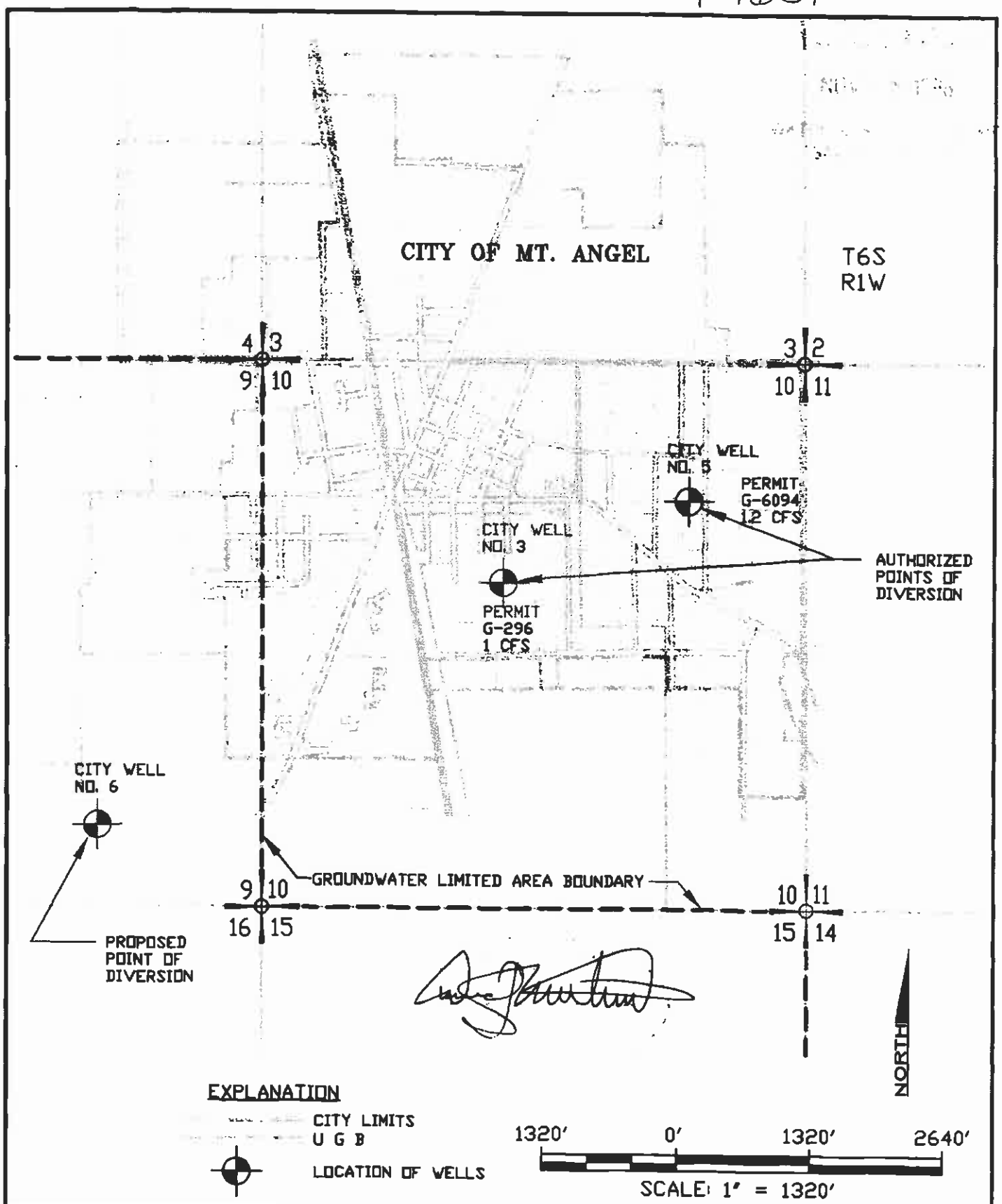
The change in point of appropriation proposed in application T-7651 is **rejected**.

Dated at Salem, Oregon this 25th day of July 2005.

For Phillip C. Ward, Director

Mailing date: JUL 27 2005

T7651



DAVID J. NEWTON ASSOCIATES, INC.
CIVIL & GEOLOGICAL ENGINEERING SERVICES
1201 S.W. 12TH AVENUE, SUITE 400
PORTLAND, OREGON 97205
(503) 228-7718
FAX (503) 228-7781

APPLICATION FOR WATER RIGHTS TRANSFER

DATE	FILE NAME	INITIALS	PROJECT NO.		FIGURE
May, 1996	WELL6	TIW	322-111	CITY OF MT. ANGEL, OREGON	

STATE OF OREGON

COUNTY OF MARION

**ORDER APPROVING A CHANGE IN PLACE OF USE,
A CHANGE IN POINT OF APPROPRIATION,
AND AN ADDITIONAL POINT OF APPROPRIATION**

Pursuant to ORS 537.705, after notice was given and no objections were filed, and finding that no injury to existing water rights would result, this order approves, as conditioned or limited herein, TRANSFER 9230 submitted by

CITY OF MT. ANGEL
P.O. BOX 960
MT. ANGEL, OREGON 97362.

The first right to be modified, as evidenced by Certificate 32220, was perfected under Permit G-2190 with a date of priority of JULY 10, 1962. The right allows the use of A WELL, in the ZOLLNER CREEK BASIN, for MUNICIPAL USE. The amount of water to which this right is entitled is limited to an amount actually beneficially used and shall not exceed 1.33 CUBIC FEET PER SECOND, if available at the original well; NE¼ NW¼, AS PROJECTED WITHIN CLEAVER DLC 51, SECTION 10, T 6 S, R 1 W, W.M.; SOUTH 76° 18' WEST 924 FEET FROM THE MOST NORTHERLY CORNER OF CLEAVER DLC 51, or its equivalent in case of rotation, measured at the well.

This is an order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60 day time period specified by ORS 183.484(2).

Pursuant to ORS 536.075 and OAR 137-004-080 and OAR 690-01-005 you may either petition for judicial review or petition the Director for reconsideration of this order.

The second right to be modified, as evidenced by Certificate 56259, was perfected under Permit G-6094 with a date of priority of FEBRUARY 18, 1975. The right allows the use of A WELL, in the ABIQUA CREEK BASIN, for MUNICIPAL USE. The amount of water to which this right is entitled is limited to an amount actually beneficially used and shall not exceed 1.2 CUBIC FEET PER SECOND, if available at the original well; SE¼ NE¼, SECTION 10, T 6 S, R 1 W, W.M.; SOUTH 37° 33' WEST 1717 FEET FROM THE NE CORNER OF SECTION 10, or its equivalent in case of rotation, measured at the well.

The use shall conform to any reasonable rotation system ordered by the proper state officer.

The authorized places of use are as follows:

PERMIT G-2190	PERMIT G-6094
S½ SW¼ SECTION 3	SW¼ W½ SE¼ SE¼ SE¼ SECTION 3
SE¼ SE¼ SECTION 4	E½ SE¼ SECTION 4
E½ NE¼ SECTION 9	E½ NE¼ NE¼ SE¼ SECTION 9
N½ N½ SW¼ N½ SE¼ SECTION 10	N½ N½ S½ SECTION 10

TOWNSHIP 6 SOUTH, RANGE 1 WEST, W.M.

The right to use water for the above purpose is restricted to beneficial use on the lands or place of use described.

The applicant proposes to change the place of use of both rights to:

S½
SECTION 3

SE¼ SE¼
SECTION 4

E½ NE¼
NE¼ SE¼
SECTION 9

N½
N½ S½
SE¼ SE¼
SECTION 10

TOWNSHIP 6 SOUTH, RANGE 1 WEST, W.M.

The applicant proposes to change the point of appropriation of PERMIT G-2190 to:

WELL 7 - SW¼ SE¼, SECTION 3, T 6 S, R 1 W, W.M.; 160 FEET NORTH AND 2574 FEET WEST FROM THE SE CORNER OF SECTION 3.

The applicant proposes an additional point of appropriation for PERMIT G-6094 located:

WELL 7 - SW¼ SE¼, SECTION 3, T 6 S, R 1 W, W.M.; 160 FEET NORTH AND 2574 FEET WEST FROM THE SE CORNER OF SECTION 3.

THESE CHANGES TO EXISTING WATER RIGHTS MAY BE MADE PROVIDED THE FOLLOWING CONDITIONS ARE MET BY THE WATER USER:

1. The proposed changes shall be completed on or before October 1, 2008.

2. The quantity of water diverted at the new point of appropriation (Well 7), together with the quantity diverted at the original point of appropriation for Permit G-6094, shall not exceed the quantity of water lawfully authorized under Permits G-2190 and G-6094.

3. The water user shall install an in-line flow meter or other suitable device for measuring and recording the quantity of water used. The type and plans of the measuring devices must be approved by the Department prior to beginning construction and shall be installed under the general supervision of the Department.

4. Water shall be acquired from the same aquifer as the original points of appropriation.

Certificates 32220 and 56259 are cancelled. When satisfactory proof of the completed changes is received, new certificates confirming these water rights will be issued.

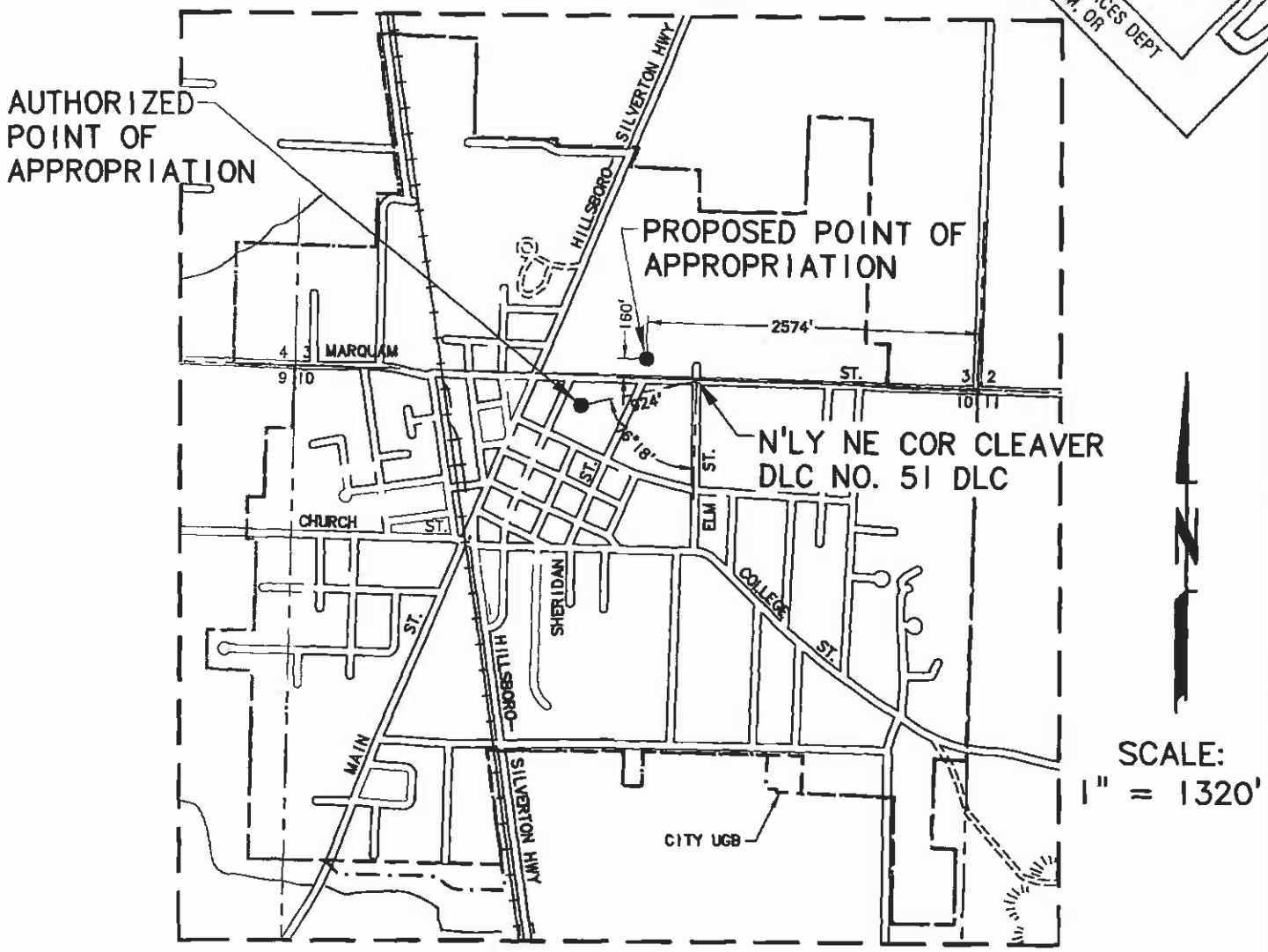
WITNESS the signature of the Water Resources Director, affixed DEC 23 2002.

For Paul R. Cleary, Director

WATER RIGHT TRANSFER MAP
T.6S.,R.1W.,W.M. SECTIONS 3 & 10

RECEIVED
AUG 28 2002
WATER RESOURCES DEPT
SALEM, OR

POINT OF APPROPRIATION FOR CERTIFICATE NO. 32220



PROPOSED CHANGE OF POINT OF APPROPRIATION FOR CERTIFICATE NO. 32220, PERMIT G-2190

IN THE NAME OF

THE CITY OF MT. ANGEL
MARION COUNTY

AUGUST 2002

Certified Water Right Examiner
#121
Philip H. Smith
Nov. 9, 1987
STATE OF OREGON
Expires 6/30/2004

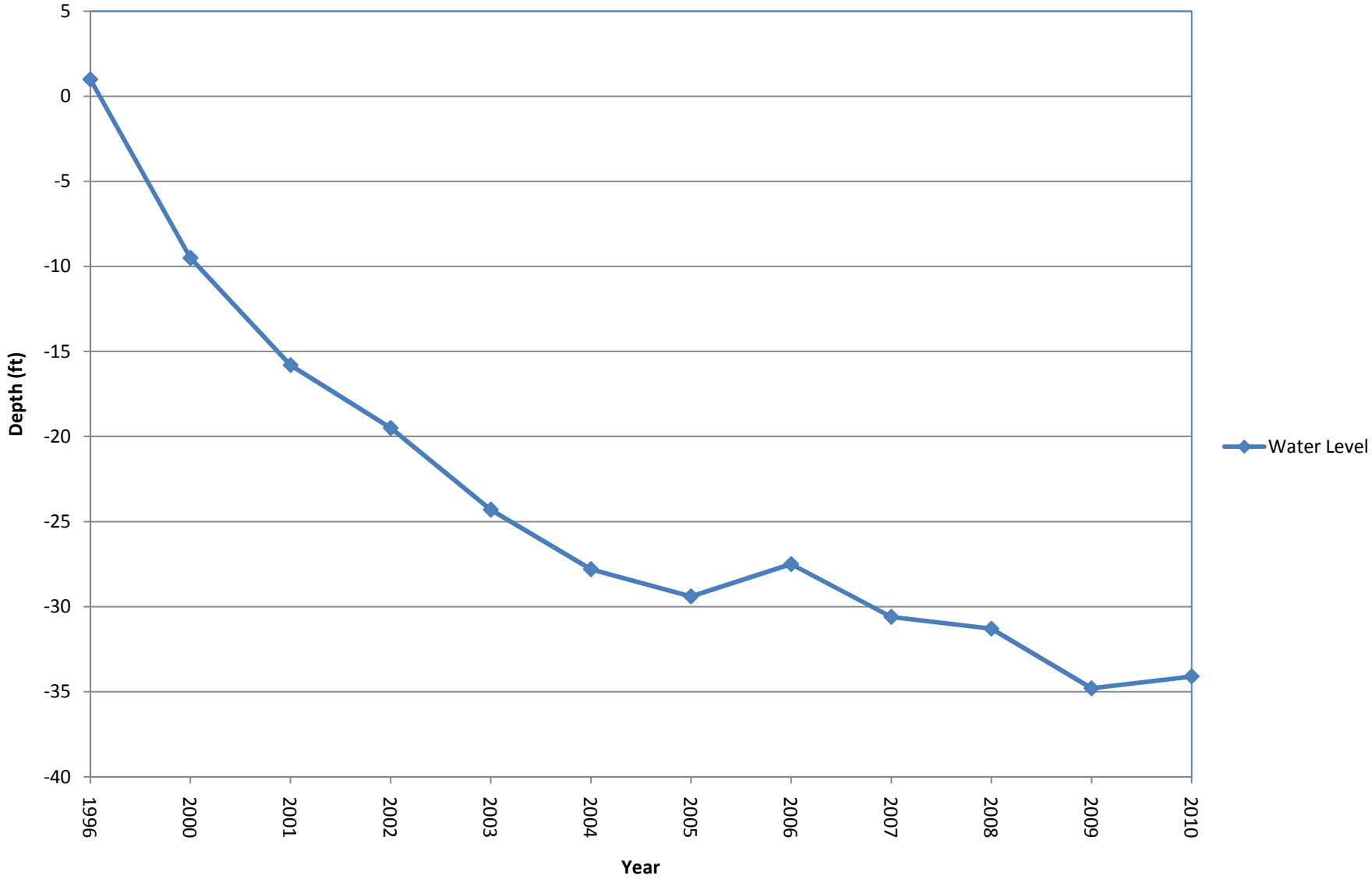
NOTE: This map is for the purpose of identifying the location of the water right only and is not intended to provide legal dimensions or locations of property lines.

T-9230

G:\02\056\403\WR PERMITS.dwg 4-7 XFER Aug/26/2002 13:01:55

APPENDIX C
Well No. 6 Water Level Data

Appendix C
Well No. 6 Water Level Data



APPENDIX D
Local Government Comments

Marion County
OREGON

PUBLIC WORKS

RECEIVED
MAY 25 2010
MURRAY, SMITH & ASSOC., INC

BOARD OF COMMISSIONERS
Sam Brentano
Janet Carlson
Patti Milne

DIRECTOR
Bill Worcester, P.E.

ADMINISTRATION

BUILDING INSPECTION

DOG CONTROL

EMERGENCY MANAGEMENT

ENGINEERING

ENVIRONMENTAL SERVICES

OPERATIONS

PARKS

PLANNING

SURVEY

May 24, 2010

Tammi S. Connolly, P.E.
Murray, Smith & Associates, Inc.
121 SW Salmon, Suite 900
Portland, Oregon 97204-2919

RE: City of Mt. Angel Draft Water System Management Plan and Water Management and Conservation Plan

Dear Ms. Connolly:

Marion County Planning appreciates the opportunity to review and comment on the April 2010 draft City of Mt. Angel Water System Management Plan and Water Management and Conservation Plan as required by the State Water Resources Department and prepared under the provisions of Oregon Administrative Rules (OAR) 660-086.

Marion County recognizes the need for water management planning and is supportive of local efforts to maintain and efficiently manage the quantity, quality and use of water resources within the county. Water planning continues to be a critical resource issue throughout the county and water service providers that take steps to monitor wells, develop wellhead protections, put conservation strategies in place and ensure the availability of back-up sources will be prepared to address future water management scenarios.

The Marion County Comprehensive Plan contains goals and policies pertaining to water resources planning and management. The goals and policies focus on: maintaining good water quality; the coordination of standards and regulations with other agencies and water service providers; striving for adequate quantity or supply of water; and educating water users about water quality and quantity. The Marion County Natural Hazards Mitigation Plan contains action items and mitigation measures that address potential drought hazard issues that are important for water limited areas.

The draft Mt. Angel Water System Management Plan and Water Management and Conservation Plan is consistent with the water resources planning goals and policies of the County Plan. The County supports the City's water management efforts and conservation strategies and appreciates the coordination with the County in developing and implementing a water management program for its water customers.

Should you have any questions regarding items in this letter, please contact me.

Sincerely,

Les Sasaki
Principal Planner
Public Works/Planning

APPENDIX E
References

APPENDIX E
References

Water Management and Conservation Plans: A Guidebook for Oregon Municipal Water Suppliers, Economic and Engineering Services, Inc., May 2003.

Population Forecasts for Marion County, its Cities and Unincorporated Area 2010 - 2030, Portland State University's Population Research Center, September 2008.

City of Mt. Angel Transportation Systems Plan, City of Mt. Angel, June 1997, Revised June 2003.

121 S.W. Salmon, Suite 900 ▪ Portland, Oregon 97204-2919 ▪ www.msa-ep.com