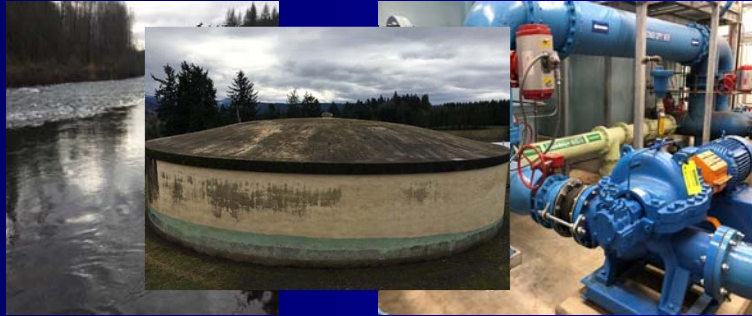


City of Molalla



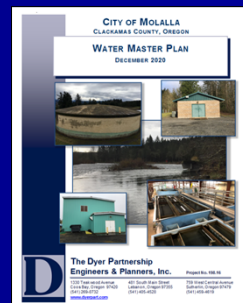
Water Management, Conservation and Water System Master Plan
May 26, 2021



1

Presentation Overview

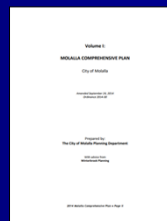
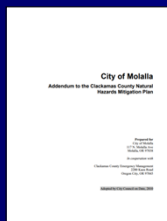
- Data Gathering and Project Planning (20 yr. Planning Period)
- Regulatory Review
- Study Area Characteristics
- Water Use and Projected Demand
- Establish Planning and Design Criteria
- Existing Water System Evaluation
- Analysis and Development of System Upgrade Alternatives
- Funding and Implementation
- Management and Conservation Plan
- Emergency Curtailment Plan



2

Background

- City of Molalla Water System Master Plan (EAS) 1996
- City of Molalla Addendum to the Clackamas County Natural Hazards Mitigation Plan (City) 2010
- Molalla Comprehensive Plan (City) 2014
- Utilities Rate Study (Donovan) 2017



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Regulatory Environment

Public Water System Regulations

- Surface Water Treatment Rule (SWTR)
- Long Term 1 Enhanced Surface Water Treatment Rule
- Long Term 2 Enhanced Surface Water Treatment Rule
- Stage 1 Disinfectants and Disinfection Byproducts Rule
- Stage 2 Disinfectants and Disinfection Byproducts Rule
- Filter Backwash Recycle Rule
- Arsenic and Clarifications to Compliance and New Source Monitoring Rule
- America's Water Infrastructure Act (AWIA)



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Water Rights

Molalla River/Trout Creek Water Rights

- Minimum instream flows established June 22, 1964
- Senior to all other municipal rights
- Junior to 70 cfs of other water rights.
- Trout Creek Water Right moving to Molalla River
 - Flow limited during dry periods

Location	Application	Permit	Certificate	Magnitude, cfs	Priority Date
Molalla River	S 29401	S 23158	91537	3.0	8/17/1954
Trout Creek	S 7783	S 4980	-	4.0	3/11/1921

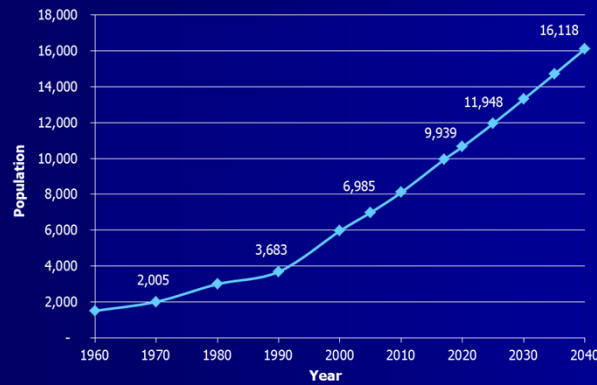


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Population Projections

PSU Population Research and Census Center



Growth Rates	%
2000-2005	3.43
2005-2010	3.22
2010-2017	3.23
2017-2020	2.39
2020-2025	2.43
2025-2030	2.29
2030-2035	2.09
2035-2040	1.92
Average	2.62



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Raw Water Demand

Existing and Projected Flows

Future Raw Water Demand						
Parameter/Year	2019	2020	2025	2030	2035	2040
Total Population	9,885	10,652	11,948	13,314	14,705	16,118
% Nonaccount Water	15	32	27	22	17	15
Water Demand						
ADD, gpd	1,235,625	1,304,870	1,388,955	1,464,540	1,525,644	1,631,948
DDD, gpd	1,492,635	1,576,283	1,677,858	1,769,164	1,842,978	1,971,393
MMD, gpd	1,769,415	1,868,574	1,988,984	2,097,221	2,184,722	2,336,949
PWD, gpd	2,006,655	2,119,109	2,255,663	2,378,413	2,477,645	2,650,283
MDD, gpd	2,283,435	2,411,400	2,566,789	2,706,470	2,819,390	3,015,839



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Water Delivered to City

Existing and Projected Flows

Future City Demand						
Parameter/Year	2019	2020	2025	2030	2035	2040
Total Population	9,885	10,652	11,948	13,314	14,705	16,118
% Nonaccount Water	15	32	27	22	17	15
Water Demand						
ADD, gpd	1,205,970	1,273,553	1,355,620	1,429,391	1,489,028	1,592,781
DDD, gpd	1,443,210	1,524,088	1,622,299	1,710,583	1,781,952	1,906,115
MMD, gpd	1,700,220	1,795,501	1,911,202	2,015,207	2,099,286	2,245,560
PWD, gpd	1,779,300	1,879,013	2,000,095	2,108,938	2,196,927	2,350,004
MDD, gpd	2,046,195	2,160,865	2,300,109	2,425,278	2,526,466	2,702,505
PHD, gpd	2,649,180	2,797,641	2,977,920	3,139,974	3,270,980	3,498,895



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Sizing and Capacity Criteria

Raw Water Source

- 20-year Maximum Day Demand (MDD) – Raw Water

Intake and Pumping Facilities

- 20-year MDD – Raw Water

Transmission Piping

- 20-year MDD – Water Delivered to City

Water Treatment Plant

- 20-year MDD – Water Delivered to City



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Water Treatment Plant History

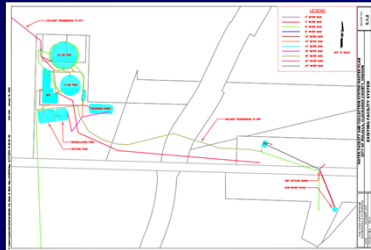
- 2.0 MGD WTP and 1.2 MG Reservoir 1976
- Intake and Influent Pump Station (IPS) Reconst. 1996
- Building Expan. and New 2.0 MGD Filter Unit 1998
- 2.0 MG Reservoir 1998
- WTP Upgrades (Second 2.0 MGD Filter Unit) 2020



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Existing Water Treatment Plant



WTP Processes

- Influent Screen (8.0 MGD)
- Influent Pump Station (3.8 MGD)
- Water Treatment Units (4.0 MGD)
- Chemical Feed Systems (4.0 MGD)
- Treated Water Reservoirs (3.2 MG)

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Water Distribution System

Distribution System Size and Material Inventory

Pipe Diameter, in	Materials of Construction					Total	% of Total
	PVC	Cast Iron	Ductile Iron	Asbestos-Cement	Steel/ Copper		
2	1,293	-	-	-	1,518	2,811	1.4%
4	1,023	248	-	-	3,052	4,323	2.2%
6	23,093	-	-	18,264	6,386	47,743	23.8%
8	66,969	-	2,628	1,608	809	72,014	35.9%
10	15,736	-	91	572	-	16,399	8.2%
12	32,759	-	79	-	-	32,838	16.4%
14	-	-	-	-	12,896	12,896	6.4%
16	793	-	-	-	-	793	0.4%
20	10,762	-	-	-	-	10,762	5.4%
Total	152,428	248	2,798	20,444	24,661	200,579	100%
% of Total	76.0%	0.1%	1.4%	10.2%	12.3%	100%	-

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Treated Water Storage

System Assessment - Treated Water Storage

Existing Reservoirs

- 1.2 MG Reservoir
- 2.0 MG Reservoir

Parameter/Year	2019	2020	2025	2030	2035	2040
Water Demand (MGD)						
MDD (Delivered to City)	2.05	2.16	2.30	2.43	2.53	2.70
Necessary Storage (MG)						
Emergency Storage (1 x MDD)	2.05	2.16	2.30	2.43	2.53	2.70
Fire Reserve (4,000 gpm @ 4 hours)	0.96	0.96	0.96	0.96	0.96	0.96
Total Required Storage	3.01	3.12	3.26	3.39	3.49	3.66
Storage Assessment (MG)						
Existing Storage	3.20	3.20	3.20	3.20	3.20	3.20
Insufficient (-)/Surplus Storage	0.19	0.08	-0.06	-0.19	-0.29	-0.46



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Water System: Deficiencies

Water Treatment Plant

- No Major Deficiencies
- Aging Chemical Storage Tanks

Intake System

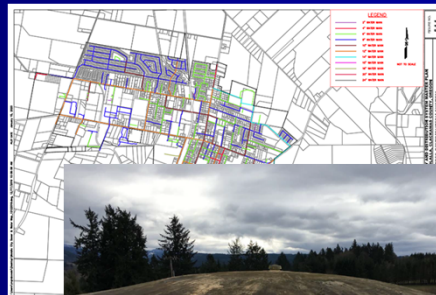
- No Screen Redundancy
- Air Scour System
- Gravel Buildup
- Pump #3 Maintenance

Storage Reservoirs

- 1.2 MG Reservoir Approaching Usable Life
- 2.0 MG Reservoir Maintenance
- Future Capacity

Distribution System

- Aging Steel and AC Water Mains
- Degrading Copper Service Lines
- High Pressure Areas



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Raw Water Facilities Improvements

Construction of New Intake (Phase I)

- River rock accumulations occur around the intake due to actively forming gravel bar.
 - Limits flow.
 - Requires rock to be manually moved every year.
- Upgrades include relocation of intake, new intake screen, new piping, and new infiltration gallery.

Project	Construction Cost	Total Project Cost
New Molalla River Intake	\$ 1,872,000	\$ 2,946,000



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WTP Improvements

Water Treatment Plant

- No major deficiencies following recent upgrade.

Chemical Storage Tanks

- Polymer and soda ash storage tanks need replacement in the next one to two years (Phase I).

Project	Construction Cost	Total Project Cost
Remove and Replace Polymer and Soda Ash Bulk Storage Tanks	\$ 78,000	\$ 120,000



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Treated Water Storage Improvements

Storage Tank Replacement & Maintenance

- The existing 1.2 MG reservoir is approaching its design life and replacement is recommended.
- Existing 2.0 MG tank is in need of crack sealing and exterior painting.

Project (Phase I)	Construction Cost	Total Project Cost
New 2.0 MG Treated Water Reservoir w/Land Acquisition	\$ 4,160,000	\$ 6,070,000
2.0 MG Tank Maintenance	\$ 1,195,000	\$ 1,830,000
Treated Water Storage Tank Seismic Valves	\$ 248,000	\$ 381,000



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Distribution and Service Improvements

Proposed Improvements

- Improvement recommendations based on detailed analysis of each component within the water system.
- Distribution and Service Improvements separated into three phases.
 - Phase I: 14 projects
 - Phase II: 12 projects
 - Phase III: 11 projects
- Cost estimates conservatively assume complete pipe replacement.
- Total project costs include: construction, engineering, contingency, administration & legal.



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Distribution System Improvements

Project No.	Location	Phase	Approx. Length (ft)	Construction Cost	Total Project Cost
1	Eckerd Ave. and E 2nd St.	1	1,400	\$ 448,000	\$ 687,000
2	Lola Ave.	1	1,400	\$ 548,000	\$ 840,000
3	Swiggle Ave.	1	750	\$ 226,000	\$ 347,000
4	Metzler Ave., West 3rd St., and West 4th St.	1	2,900	\$ 998,000	\$ 1,528,000
5	Hart St. and Section St.	1	2,000	\$ 647,000	\$ 992,000
6	South Molalla Ave., E 6th St., and May St.	1	2,100	\$ 717,000	\$ 1,099,000
7	E 6th, E 7th St., and South Cole Ave.	1	3,400	\$ 1,142,000	\$ 1,750,000
8	E 3rd St., E 4th St., and Stowers Rd.	1	1,400	\$ 543,000	\$ 833,000
9	Molalla Elem. School and PW Shops	1	1,550	\$ 463,000	\$ 710,000
Subtotal Phase I				\$ 5,732,000	\$ 8,786,000
10	North Cole Ave.	2	600	\$ 206,000	\$ 317,000
11	Toliver Dr., Kennel St., & West Ross St.	2	2,300	\$ 798,000	\$ 1,222,000
12	West Heintz St.	2	1,800	\$ 655,000	\$ 1,004,000
13	Robbins St. and Fenton Ave.	2	2,000	\$ 672,000	\$ 1,030,000
14	Ridings Ave.	2	2,100	\$ 673,000	\$ 1,032,000
15	Toliver Rd.	2	1,100	\$ 404,000	\$ 620,000
16	W. 7 th St.	2	700	\$ 218,000	\$ 335,000
Subtotal Phase II				\$ 3,626,000	\$ 5,560,000
17	Frances St.	3	1,400	\$ 469,000	\$ 720,000
18	Shirley St.	3	3,600	\$ 1,250,000	\$ 1,914,000
19	Miller St. and North Cole Ave.	3	3,500	\$ 1,143,000	\$ 1,751,000
20	South Molalla Forest Rd. to South Molalla Ave.	3	7,400	\$ 2,427,000	\$ 3,715,000
21	Transmission Main Reroute and Replacement	3	5,500	\$ 2,068,000	\$ 3,166,000
22	S Molalla Forest Rd. Water Line Improvements	3	2,200	TBD	TBD
23	N. Molalla Avenue Water Line Improvements	3	500	TBD	TBD
24	545 W. Main Street Water Line Improvements	3	500	TBD	TBD
Subtotal Phase III				\$ 7,357,000	\$ 11,266,000
Total				\$ 16,715,000	\$ 25,612,000



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Pressure Reducing Valves

New Pressure Reducing Valves (PRVs)

- The City experiences high water pressure zones on the west side of the City.
- It is recommended to split the Molalla water system into three pressure zones by way of four new PRVs.
- The new PRV stations are recommended near the intersections of West Main Street and Dixon Avenue, to the west of West Heintz Street and Creamery Creek Lane, and Toliver Road and Pegasus Court; and to the east of S. Feyrer Park Road and Mathias Road.

Project (Phase I)	Construction Cost	Total Project Cost
Pressure Reducing Valves	\$ 679,000	\$ 1,040,000



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Comprehensive Leak Analysis Program

Reducing Water System Loss

- In order to limit total system losses a comprehensive leak analysis program is recommended to be initiated by the City.
- The analysis should focus on areas with known leaks, pipes that have surpassed or are approaching their usable life, and pipe material prone to leaking.

Project (Phase I)	Construction Cost	Total Project Cost
Comprehensive Leak Analysis Program	\$ 26,000	\$ 42,400



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Improvements Summary

Improvement Phasing and Costs - Summary

Location	Phase	Construction Cost	Total Project Cost
Distribution System Improvements	1	\$ 5,732,000	\$ 8,786,000
Water Service Improvements	1	\$ 522,000	\$ 807,000
New Molalla River Intake	1	\$ 1,872,000	\$ 2,946,000
New 2.0 MG Treated Water Reservoir w/Land Acquisition	1	\$ 4,160,000	\$ 6,550,000
2.0 MG Tank Maintenance	1	\$ 1,195,000	\$ 1,830,000
Pressure Reducing Valves	1	\$ 679,000	\$ 1,040,000
Remove and Replace Polymer and Soda Ash Bulk Storage Tanks	1	\$ 78,000	\$ 120,000
Comprehensive Leak Analysis Program	1	\$ 26,000	\$ 42,400
Treated Water Storage Tank Seismic Valves	1	\$ 248,000	\$ 381,000
Disinfection Contact Time Tracer Study	1	-	\$ 50,000
Subtotal Phase I		\$ 14,512,000	\$ 22,552,400
Water Master Plan Update	2	-	\$ 200,000
Distribution System Improvements	2	\$ 3,626,000	\$ 5,560,000
Water Service Improvements	2	\$ 541,000	\$ 832,000
Subtotal Phase II		\$ 4,167,000	\$ 6,592,000
Distribution System Improvements	3	\$ 7,357,000	\$ 11,266,000
Water Service Improvements	3	\$ 354,000	\$ 543,000
Subtotal Phase III		\$ 7,711,000	\$ 11,809,000
Total		\$26,390,000	\$40,953,400



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Water Management & Conservation Plan

Long term program for the beneficial reduction in water loss, waste and consumption

- Water Auditing
- Meter Testing and Maintenance
- Rate Structure and Billing
- Public Education
- Leak Detection



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Emergency Curtailment Plan

Short term program intended to drastically reduce water use as a result of an emergency, catastrophic event or serious water shortage.

- Assessing Water Supply and Storage
- Indicators of Water Shortage
- Stages of Alert
- Curtailment Actions



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Plan Reviews

Oregon Health Authority - Water Master Plan

- Approval Granted – February 11, 2021

Oregon Water Resources Department - Water Management and Conservation Plan

- Review completed April 16, 2021
- Plan being updated to address review comments



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Questions and Comments



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