



City of Longview

1525 Broadway
Longview, WA 98632
www.ci.longview.wa.us

Agenda

Public Works SubCommittee

Monday, April 3, 2023

5:00 PM

Public Works Conference Room
1st Floor, City Hall

1. CALL TO ORDER

2. ROLL CALL

3. MEETING NOTES

23-000995 Meeting notes from March 20, 2023

4. OLD BUSINESS

5. NEW BUSINESS

23-000997 Water System

6. PUBLIC COMMENT

7. ADJOURNMENT - Next meeting May 1st



City of Longview

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Minutes

Public Works SubCommittee

Monday, March 20, 2023

5:00 PM

Public Works Conference Room,
1st Floor, City Hall

1. **CALL TO ORDER**

2. **ROLL CALL**

Councilmember Kendall stated that Councilmember Strobel contacted her and would be unable to attend.

Present: Councilmember Ruth Kendall

Not in attendance: Councilmember Christopher Ortiz; Councilmember Hillary Strobel

Staff: Karl Enyeart, City Engineer; Morgan Palmer, Engineer; Chris Collins, PW Maintenance Manager; Nancy Vandehey, Admin

3. **APPROVAL OF MEETING NOTES**

23-000881 Meeting notes from January 30, 2023 Special Meeting

4. **OLD BUSINESS**

5. **NEW BUSINESS**

23-000883 Complete Street Projects

This item was not discussed as Councilmember Ruth Kendall serves as the Liaison for the Complete Streets Advisory Committee and this would be a review for her.

She suggested keeping to topics that do not have an assigned board.

6. **PUBLIC COMMENT**

7. **ADJOURNMENT - Next meeting April 3rd**

The meeting adjourned at 5:25 pm.



City of Longview

Agenda Summary

Water System

Attachments:

1. Agenda 4-3-23

PW COMMITTEE MEETING 4-3-23

Agenda:

WAC 246-290

WSP - checklist

Sentry internet database

[https://fortress.wa.gov/doh/eh/portal/odw/si/Disclaimer.aspx?Page=/portal/odw/si/fin
dwatersystem.aspx](https://fortress.wa.gov/doh/eh/portal/odw/si/Disclaimer.aspx?Page=/portal/odw/si/fin
dwatersystem.aspx)

Video: the only state capital where you can't drink the water

<https://www.youtube.com/watch?v=xOdF7A1ry7E>

Asset life

Preventative maintenance/FTEs

Utility rates/comparison to other cities

HTML has links - PDF has Authentication**Complete Chapter**[HTML](#)[PDF](#)

Including dispositions

Chapter 246-290 WAC | [Show Dispositions](#)**Last Update: 3/9/22****GROUP A PUBLIC WATER SUPPLIES****WAC Sections****PART 1.****GENERAL PROVISIONS**

HTML	PDF	246-290-001	Purpose and scope.
HTML	PDF	246-290-002	Guidance.
HTML	PDF	246-290-010	Definitions, abbreviations, and acronyms.
HTML	PDF	246-290-020	Applicability.
HTML	PDF	246-290-025	Adoption by reference.
HTML	PDF	246-290-030	General administration.
HTML	PDF	246-290-035	Water system ownership.
HTML	PDF	246-290-040	Engineering requirements.
HTML	PDF	246-290-050	Enforcement.
HTML	PDF	246-290-060	Variances, exemptions, and waivers.

PART 2.**PLANNING AND ENGINEERING DOCUMENTS**

HTML	PDF	246-290-100	Water system plan.
HTML	PDF	246-290-105	Small water system management program.
HTML	PDF	246-290-106	Duty to provide service.
HTML	PDF	246-290-107	Place of use expansion.
HTML	PDF	246-290-108	Consistency with local plans and regulations.
HTML	PDF	246-290-110	Project report.
HTML	PDF	246-290-120	Construction documents.

HTML	PDF	246-290-125	Project report and construction document submittal exceptions.
HTML	PDF	246-290-130	Source approval.
HTML	PDF	246-290-131	Emergency sources and supplies.
HTML	PDF	246-290-132	Interties.
HTML	PDF	246-290-135	Source water protection.
HTML	PDF	246-290-140	Existing system as-built approval.

PART 3.

DESIGN OF PUBLIC WATER SYSTEMS

HTML	PDF	246-290-200	Design standards.
HTML	PDF	246-290-220	Drinking water materials and additives.
HTML	PDF	246-290-221	Water demand design criteria.
HTML	PDF	246-290-222	Water system physical capacity.
HTML	PDF	246-290-230	Distribution systems.
HTML	PDF	246-290-235	Finished water storage facilities.
HTML	PDF	246-290-250	Treatment design.

PART 4.

WATER QUALITY

HTML	PDF	246-290-300	Monitoring requirements.
HTML	PDF	246-290-310	Maximum contaminant levels (MCLs) and maximum residual disinfectant levels (MRDLs).
HTML	PDF	246-290-315	State action levels (SALs) and state maximum contaminant levels (MCLs).
HTML	PDF	246-290-320	Follow-up action.

PART 5.

WATER SYSTEM OPERATIONS

HTML	PDF	246-290-415	Operations and maintenance.
HTML	PDF	246-290-416	Sanitary surveys.
HTML	PDF	246-290-420	Reliability and emergency response.
HTML	PDF	246-290-451	Disinfection of drinking water.
HTML	PDF	246-290-453	Corrective action under the GWR.

HTML	PDF	246-290-455	Operation of chemical contaminant treatment facilities.
HTML	PDF	246-290-460	Fluoridation of drinking water.
HTML	PDF	246-290-470	Uncovered finished water storage facilities.
HTML	PDF	246-290-480	Recordkeeping and reporting.
HTML	PDF	246-290-485	Recordkeeping and reporting for groundwater systems.
HTML	PDF	246-290-490	Cross-connection control.
HTML	PDF	246-290-496	Metering requirements.
HTML	PDF	246-290-500	Severability.

PART 6.

SURFACE WATER TREATMENT

Subpart A - Introduction and General Requirements

HTML	PDF	246-290-601	Purpose of surface water treatment.
HTML	PDF	246-290-620	Applicability of surface water treatment requirements.
HTML	PDF	246-290-630	General requirements.
HTML	PDF	246-290-632	Treatment technique violations.
HTML	PDF	246-290-634	Follow-up to treatment technique violations.
HTML	PDF	246-290-636	Determination of disinfectant contact time (T).
HTML	PDF	246-290-638	Analytical requirements.
HTML	PDF	246-290-639	SWTR records.
HTML	PDF	246-290-640	Determination of GWI sources.

Subpart B - Requirements for Filtered Systems

HTML	PDF	246-290-650	Compliance requirements for filtered systems.
HTML	PDF	246-290-652	Filtration technology and design criteria for existing filtered systems.
HTML	PDF	246-290-654	Treatment criteria for filtered systems.
HTML	PDF	246-290-660	Filtration.
HTML	PDF	246-290-662	Disinfection for filtered systems.
HTML	PDF	246-290-664	Monitoring for filtered systems.

[HTML](#) [PDF](#) **246-290-666** Reporting for filtered systems.

[HTML](#) [PDF](#) **246-290-668** Watershed control.

Subpart C - Requirements for Systems Installing Filtration Facilities

[HTML](#) [PDF](#) **246-290-670** Compliance requirements for existing unfiltered systems installing filtration.

[HTML](#) [PDF](#) **246-290-672** Interim treatment requirements.

[HTML](#) [PDF](#) **246-290-674** Interim monitoring and reporting.

[HTML](#) [PDF](#) **246-290-676** Filtration technology and design criteria.

[HTML](#) [PDF](#) **246-290-678** Reliability for filtered systems.

Subpart D - Requirements for Other Unfiltered Systems

[HTML](#) [PDF](#) **246-290-686** Compliance requirements for unfiltered systems.

[HTML](#) [PDF](#) **246-290-690** Criteria to remain unfiltered.

[HTML](#) [PDF](#) **246-290-691** Criteria for unfiltered systems with a "limited alternative to filtration" to remain unfiltered.

[HTML](#) [PDF](#) **246-290-692** Disinfection for unfiltered systems.

[HTML](#) [PDF](#) **246-290-694** Monitoring for unfiltered systems.

[HTML](#) [PDF](#) **246-290-696** Reporting for unfiltered systems.

PART 7. REPORTING

Subpart A - Public Notification and Consumer Information

[HTML](#) [PDF](#) **246-290-71001** Public notification.

[HTML](#) [PDF](#) **246-290-71002** Public notice content.

[HTML](#) [PDF](#) **246-290-71003** Public notification distribution.

[HTML](#) [PDF](#) **246-290-71004** Public notification mandatory language.

[HTML](#) [PDF](#) **246-290-71005** Special public notification requirements.

[HTML](#) [PDF](#) **246-290-71006** Public notice for contaminants with a SAL and other unregulated contaminants.

[HTML](#) [PDF](#) **246-290-71007** Public notification special provisions.

Subpart B - Consumer Confidence Reports

[HTML](#) [PDF](#) **246-290-72001** Purpose and applicability of the consumer confidence report requirements.

HTML	PDF	246-290-72002	Reporting dates.
HTML	PDF	246-290-72003	Report contents—Source water.
HTML	PDF	246-290-72004	Report contents—Definitions.
HTML	PDF	246-290-72005	Report contents—Information on detected contaminants.
HTML	PDF	246-290-72006	Report contents—Information on Cryptosporidium, radon, and other contaminants.
HTML	PDF	246-290-72007	Report contents—Compliance with National Primary Drinking Water Regulations.
HTML	PDF	246-290-72008	Report contents—Variances and exemptions.
HTML	PDF	246-290-72009	Report contents—Additional information.
HTML	PDF	246-290-72010	Report contents—Required additional health information.
HTML	PDF	246-290-72011	Report delivery and recordkeeping.
HTML	PDF	246-290-72012	Regulated contaminants.
HTML	PDF	246-290-72013	Report contents—Groundwater systems.

PART 8.

WATER USE EFFICIENCY

HTML	PDF	246-290-800	Purpose and applicability.
HTML	PDF	246-290-810	Water use efficiency program.
HTML	PDF	246-290-820	Distribution system leakage standard.
HTML	PDF	246-290-830	Water use efficiency goal setting.
HTML	PDF	246-290-840	Water use efficiency performance reports.

FEES

HTML	PDF	246-290-990	Water system evaluation and project review and approval fees.
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Content Description

1 Description of Water System

Updated WFI, signed and dated.

Ownership and management.

System history and background.

Description of and discussion about related plans: CWSP, groundwater management plan, WRIA and

City/County land use plans & zoning.

Service Area Maps

- These should clearly show the service area and retail service area.

Policies: Service area, conditions of service, annexation.

- Please see Publication DOH 331-438.

Duty to serve requirement: procedures, conditions, appeals.

- Please see Publication DOH 331-366.

Consistency from local planning agency (LGC statement.) Please have this reviewed and signed by the City and County Planning Department.

- <http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-568.docx>

2 Planning Data

- Demand analysis based on water use.
- Include analysis of population, service connections & ERUs.
- Source and service meter data (preferably three or more, typically 6 years). Provide monthly and annual production and consumption totals.

- Provide usage by customer class. Analyze industrial and commercial demands separate from the residential demand and multifamily structures separate from the single family residences.

- **Define ERU.**

- Provide data and assumptions (including DSL) for calculating MDD, PHD and ADD.
- Demand analysis per pressure zone and the whole system.
- Consider also water supplied to other systems.
- If >1000, also include seasonal variations in consumption by customer class.

Provide 10 & 20 year projections for population, service connections, & ERUs.

- **Provide 10 & 20 year projections for demand forecasts with and without expected efficiency savings (conservation).**

Interties discussion of all existing and proposed interties and copies of agreements.

Provide 10 & 20 year projections for land use and zoning.

Distribution System Leakage percentage and volume expressed in ERUs.

3 System Analysis

Provide assumptions and basis of analysis.

- System design standards.
- Policies on operations and expected level of service (such as standby storage, pumping restrictions and emergency back-up power).
- Fire flow requirements and if nesting is allowed. This needs to be confirmed by the local fire authority.

System inventory and description.

- This should include a full list of assets, including install date, life expectancy and replacement costs in today dollars and at end of life dollars. Include discussion of criticality.
This could be included in a different section of the plan if more appropriate, most likely Chapter 8.

Capacity analysis (legal and physical capacity).

- Limiting factor analysis (WSDM worksheet 4-1)
Please see Publication DOH 331-123.
 - o *This is most likely too simplified and doesn't apply to your system.*
 - o *Limiting factor most likely capacity of treatment plan or distribution*
 - Include the results of the limiting factor analysis in a table format.
 - Show source, pumping, water rights, treatment, storage, and distribution capacities.
 - Analysis per pressure zone and the whole system.

- *Do storage by pressure zone.*
- Water rights analysis- include water right self-assessment form for existing, 10 & 20-year projections, including copies of water right certificate(s).
- <http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-372-F.docx>. *This link takes you to the self-assessment form.*

Hydraulic analysis of distribution system. *Do upgraded hydraulic model*

- Describe the model used.
- Evaluate the system based on PHD and MDD + Fire flow.
- Evaluate the current conditions, and 10- and 20-year planning periods.
- Check minimum pressures and maximum velocities.
- Include assumptions of model, pressure zone boundary conditions, and a summary of model input information. Storage assumptions should be based on minimum reservoir levels.
- Include verification and calibration methods and results.
- Summary of system deficiencies

Analysis of possible improvement projects.

4 Water Use Efficiency Program

Water Use Efficiency (WUE) Program per WAC 246-290-810.

- Describe the current WUE program.
- **Describe WUE goal & document public adoption process. *Please see Publication DOH 331-402.***
- Describe measures that will be implemented to achieve the goal & include schedule & costs in the budget.
- Describe process used to evaluate the WUE measures you did not implement.
- Describe yearly consumer education.
- Estimate projected water savings from selected measures.
- Describe process that will be used to determine effectiveness of the program

≥ 1000 Connections

- Estimate water saved from efficiency measures over the past 6 years
- Quantitative evaluation of measures to determine if they are cost-effective, include marginal costs of water production.
- Evaluate measures for cost-effectiveness if shared with other systems.
- Quantitative or qualitative evaluation of measures to determine if they are cost-effective from the societal perspective.

Source & Service Meters - or schedule for installation w/activities to minimize leakage.

Ten percent of all service meters should be replaced annually to maintain 10 year life span.

Water Loss Action Control Plan WAC 246-290-820.

This is required if DSL is greater than 10%.

Water supply characteristics, description & discussion on effect of water use.

Source of supply analysis and evaluation of supply alternatives.

≥1,000 connections explore reclaimed water opportunities.

- *You could talk about your backwash usage here*

5 Source Water Protection

Wellhead protection program.

2 year update (contaminant inventory, letters and map).

Susceptibility assessments to determine how susceptible the source(s) are to contamination.

- Delineation of 6-month, 1-year, 5-year, and 10-year time of travel zones that show the land area contributing water (and potential contamination) to the source.
- Inventory of potential contaminant sites (names and addresses), which must be updated every two years. If septic systems drainfields are utilized, these are potential sources of contaminants.
- Documentation of notification letters to:
 - § Owners and operators of potential contaminant sites (*include properties with septic systems*).
 - § Regulatory agencies.
 - § Local emergency responders.

Contingency plan that makes provisions in case of a drinking water emergency.

6 Operation and Maintenance Program

Water system management and personnel.

Operator certification.

Please list the operators' name, certification numbers and expiration dates.

Routine operating procedures and preventive maintenance.

- Standard Operating Procedures (SOP Manual-Surface Water Treatment Plant).

Water quality sampling procedures & program

See new WQMS information at: <https://fortress.wa.gov/doh/eh/portal/odw/si/Intro.aspx>

Analysis and discussion of Water Quality.

- *This section can be included anywhere in the plan, isn't necessarily source water protection.*
- *Include your chlorine residual – what you maintain in your distribution*

Coliform monitoring plan, including maps (and triggered source monitoring plan).

- Please visit our website at:

<http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/Contaminants/Coliform/RevisedTotalColiformRuleRTCR>

- *Submit an updated plan with sample sites*

- Charese Gainor with our office can help you with any questions on this plan. You can contact her at Charese.Gainor@doh.wa.gov.

Please include a Lead and copper Monitoring Plan and Map

- Please visit our website at: <https://www.doh.wa.gov/Portals/1/Documents/Pubs/331-111.pdf>

- *Based on Longview's lead and copper sampling, the system is deemed optimized. If you exceed current levels you will have to do a corrosion control plan.*

Please include an Emergency Response Plan *this could be fulfilled in tangent with EPA's risk and resilience assessment.*

- We have a fill in the blank template at: <http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-211.pdf>.

- Water system contacts.
- Vendor Contacts (Equipment replacement, water haulers, etc.).
- Example notices (water outages, BWA, coliform MCL, emergency conservation).
- Emergency government officials contact info for Office of Drinking Water (ODW - please list 360-236-3030 for Regional Engineer), County Health Dept., State and County Emergency Operations Centers.
- List of emergency sources and interties.
- Emergency response planning activities to ensure preparedness.

Water shortage response plan and service reliability. (See WAC 246-290-420).

Cross-connection control program (See WAC 246-290-490).

- Who is the **City's/County's/PUD's** Cross Connection Control Specialist?
- Provide copy of the CCC ordinance/resolution.
- Provide a copy of the Cross Connection Control Program containing all 10 Elements of the program (WAC 246-290-490).

§ This includes an inventory of all devices relied upon to protect the public water system, which include the assessed degree of hazard, assembly location and history of inspections.

- Provide status of implementing Cross Connection Control Program.
- Provide a copy of most recent year's annual summary report

Recordkeeping, reporting, and customer complaint program

Summary of O&M deficiencies

7 Distribution Facilities Design and Construction Standards

Standard construction specification for distribution mains

8 Capital Improvement Program

Capital improvement schedule for 10 and 20 years.

- Include inventory and assessment of existing system components.

9 Financial Program

Financial program, including demonstration of financial viability by providing:

- i. A summary of past income and expenses; *(This should include past 2 to 3 years data at a minimum)*.
- ii. A 10-year balanced operational budget;
- iii. A plan for collecting the revenue necessary to maintain cash flow stability and to fund the capital improvement program and emergency improvements; *Existing and future loan payments need to be included in the budget. For example, if part of the CIP will be paid by loan, those payments should be included in budget. List the current water rate.*
- iv. An evaluation that has considered:
 - A. The affordability of water rates; and
 - B. The feasibility of adopting and implementing a rate structure that encourages water demand efficiency.

Analysis of connection fees should include costs of additional infrastructure required to serve those additional connections and buy-in to the existing infrastructure costs.

10 Miscellaneous Documents

The WSP review requires

- adoption by the owner/board (provide notice and minutes)
The WSP must be approved by the **City Council/Board of Commissioners/Board/Owner** before the WSP can be approved.
- Meeting of the consumers
- WUE public forum (provide copy of notice and minutes)
- Goal setting must be addressed at a public forum, after the Public Notice that specifically states that the WUE goals will be discussed, is published.

· [Public notice may be posted on DOH website in order to meet public forum notice requirements. http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/WaterSystemDesignandPlanning/WaterUseEfficiency.aspx.](http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater/WaterSystemDesignandPlanning/WaterUseEfficiency.aspx)

County/Adjacent Utility Correspondence *(provide a copy of WSP to adjacent water utilities and local governments with jurisdiction or provide notice with link to WSP on website).*

≥1000 connections - State Environmental Policy Act (SEPA) Determination is required, for DOH, when the water system has more than 1,000 connections. Provide copy of the SEPA Environmental Checklist, SEPA Determination, and the notice in paper and on the Ecology SEPA Registry.

Agreements: franchise, wheeling, mutual aid, inter-local and other agreements (if any exist).

Inventory of Water Mains							
Diameter (inches)	Cast Iron	Ductile Iron	AC	Steel	PVC/HDPE	Total (feet)	Total (miles)
4	63,941	10,019	3,773	1,532		79,265	15.0
6	341,962	92,338	9,024	3,198	1,538	448,060	84.9
8	205,780	131,778	5,654	1,364		344,576	65.3
10	3,595	7,025				10,620	2.0
12	77,084	66,156	1,066		990	145,296	27.5
14	4,531	5,523				10,054	1.9
16	1,076	12,839	5,093			19,008	3.6
20	1,303	21,726	5,268	5,067		33,364	6.3
24	2,949	290				3,239	0.6
30		6,784				6,784	1.3
36		292				292	0.1
Total Feet	702,221	354,770	29,878	11,161	2,528	1,100,558	
Total Miles	133.0	67.2	5.7	2.1	0.5		208.4



							2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
\$/ft	Diameter (inches)	Cast Iron	Ductile Iron	AC	Steel	PVC/HDPE	1	1.02	1.04	1.06	1.08	1.10	1.13	1.15	1.17	1.20
250	4	63,941					\$ 399,631	\$ 407,624	\$ 415,776	\$ 424,092	\$ 432,574	\$ 441,225	\$ 450,050	\$ 459,051	\$ 468,232	\$ 477,596
275	6	341,962					\$ 2,350,989	\$ 2,398,009	\$ 2,445,969	\$ 2,494,888	\$ 2,544,786	\$ 2,595,682	\$ 2,647,595	\$ 2,700,547	\$ 2,754,558	\$ 2,809,649
300	8	205,780					\$ 1,543,350	\$ 1,574,217	\$ 1,605,701	\$ 1,637,815	\$ 1,670,572	\$ 1,703,983	\$ 1,738,063	\$ 1,772,824	\$ 1,808,281	\$ 1,844,446
325	10	3,595					\$ 29,209	\$ 29,794	\$ 30,389	\$ 30,997	\$ 31,617	\$ 32,250	\$ 32,895	\$ 33,552	\$ 34,223	\$ 34,908
350	12	77,084					\$ 674,485	\$ 687,975	\$ 701,734	\$ 715,769	\$ 730,084	\$ 744,686	\$ 759,580	\$ 774,771	\$ 790,267	\$ 806,072
400	14	4,531					\$ 45,310	\$ 46,216	\$ 47,141	\$ 48,083	\$ 49,045	\$ 50,026	\$ 51,026	\$ 52,047	\$ 53,088	\$ 54,150
450	16	1,076					\$ 12,105	\$ 12,347	\$ 12,594	\$ 12,846	\$ 13,103	\$ 13,365	\$ 13,632	\$ 13,905	\$ 14,183	\$ 14,467
500	20	1,303					\$ 16,288	\$ 16,613	\$ 16,946	\$ 17,284	\$ 17,630	\$ 17,983	\$ 18,342	\$ 18,709	\$ 19,083	\$ 19,465
550	24	2,949					\$ 40,549	\$ 41,360	\$ 42,187	\$ 43,031	\$ 43,891	\$ 44,769	\$ 45,664	\$ 46,578	\$ 47,509	\$ 48,460
250	4		10,019													
275	6		92,338													
300	8		131,778													
325	10		7,025													
350	12		66,156													
400	14		5,523													
450	16		12,839													
500	20		21,726													
550	24		290													
600	30		6,784													
650	36		292													
250	4			3,773			\$ 47,163	\$ 48,106	\$ 49,068	\$ 50,049	\$ 51,050	\$ 52,071	\$ 53,113	\$ 54,175	\$ 55,258	\$ 56,364
275	6			9,024			\$ 124,080	\$ 126,562	\$ 129,093	\$ 131,675	\$ 134,308	\$ 136,994	\$ 139,734	\$ 142,529	\$ 145,379	\$ 148,287
300	8			5,654			\$ 84,810	\$ 86,506	\$ 88,236	\$ 90,001	\$ 91,801	\$ 93,637	\$ 95,510	\$ 97,420	\$ 99,368	\$ 101,356
325	10						\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
350	12			1,066			\$ 18,655	\$ 19,028	\$ 19,409	\$ 19,797	\$ 20,193	\$ 20,597	\$ 21,009	\$ 21,429	\$ 21,857	\$ 22,294
400	14						\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
450	16			5,093			\$ 114,593	\$ 116,884	\$ 119,222	\$ 121,606	\$ 124,039	\$ 126,519	\$ 129,050	\$ 131,631	\$ 134,263	\$ 136,949
500	20			5,268			\$ 131,700	\$ 134,334	\$ 137,021	\$ 139,761	\$ 142,556	\$ 145,407	\$ 148,316	\$ 151,282	\$ 154,308	\$ 157,394
250	4				1,532		\$ 19,150	\$ 19,533	\$ 19,924	\$ 20,322	\$ 20,729	\$ 21,143	\$ 21,566	\$ 21,997	\$ 22,437	\$ 22,886
275	6				3,198		\$ 43,973	\$ 44,852	\$ 45,749	\$ 46,664	\$ 47,597	\$ 48,549	\$ 49,520	\$ 50,511	\$ 51,521	\$ 52,551
300	8				1,364		\$ 20,460	\$ 20,869	\$ 21,287	\$ 21,712	\$ 22,147	\$ 22,589	\$ 23,041	\$ 23,502	\$ 23,972	\$ 24,452
325	10						\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
350	12						\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
400	14						\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
450	16						\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
500	20				5,067		\$ 126,675	\$ 129,209	\$ 131,793	\$ 134,429	\$ 137,117	\$ 139,859	\$ 142,657	\$ 145,510	\$ 148,420	\$ 151,388
250	6					1,538										
275	8															
300	10															
325	12				990											
Annual totals							\$ 5,843,174	\$ 5,960,038	\$ 6,079,238	\$ 6,200,823	\$ 6,324,840	\$ 6,451,336	\$ 6,580,363	\$ 6,711,970	\$ 6,846,210	\$ 6,983,134

2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
1.22	1.24	1.27	1.29	1.32	1.35	1.37	1.40	1.43	1.46	1.49	1.52	1.55	1.58	1.61
\$ 487,148	\$ 496,891	\$ 506,829	\$ 516,966	\$ 527,305	\$ 537,851	\$ 548,608	\$ 559,580	\$ 570,772	\$ 582,187	\$ 593,831	\$ 605,708	\$ 617,822	\$ 630,178	\$ 642,782
\$ 2,865,842	\$ 2,923,159	\$ 2,981,622	\$ 3,041,255	\$ 3,102,080	\$ 3,164,121	\$ 3,227,404	\$ 3,291,952	\$ 3,357,791	\$ 3,424,947	\$ 3,493,446	\$ 3,563,315	\$ 3,634,581	\$ 3,707,272	\$ 3,781,418
\$ 1,881,335	\$ 1,918,962	\$ 1,957,341	\$ 1,996,488	\$ 2,036,418	\$ 2,077,146	\$ 2,118,689	\$ 2,161,063	\$ 2,204,284	\$ 2,248,370	\$ 2,293,337	\$ 2,339,204	\$ 2,385,988	\$ 2,433,707	\$ 2,482,382
\$ 35,606	\$ 36,318	\$ 37,045	\$ 37,785	\$ 38,541	\$ 39,312	\$ 40,098	\$ 40,900	\$ 41,718	\$ 42,553	\$ 43,404	\$ 44,272	\$ 45,157	\$ 46,060	\$ 46,981
\$ 822,193	\$ 838,637	\$ 855,410	\$ 872,518	\$ 889,969	\$ 907,768	\$ 925,923	\$ 944,442	\$ 963,331	\$ 982,597	\$ 1,002,249	\$ 1,022,294	\$ 1,042,740	\$ 1,063,595	\$ 1,084,867
\$ 55,233	\$ 56,337	\$ 57,464	\$ 58,613	\$ 59,786	\$ 60,981	\$ 62,201	\$ 63,445	\$ 64,714	\$ 66,008	\$ 67,328	\$ 68,675	\$ 70,048	\$ 71,449	\$ 72,878
\$ 14,756	\$ 15,051	\$ 15,352	\$ 15,659	\$ 15,972	\$ 16,292	\$ 16,618	\$ 16,950	\$ 17,289	\$ 17,635	\$ 17,987	\$ 18,347	\$ 18,714	\$ 19,088	\$ 19,470
\$ 19,854	\$ 20,251	\$ 20,656	\$ 21,070	\$ 21,491	\$ 21,921	\$ 22,359	\$ 22,806	\$ 23,263	\$ 23,728	\$ 24,202	\$ 24,686	\$ 25,180	\$ 25,684	\$ 26,197
\$ 49,429	\$ 50,417	\$ 51,426	\$ 52,454	\$ 53,503	\$ 54,573	\$ 55,665	\$ 56,778	\$ 57,914	\$ 59,072	\$ 60,253	\$ 61,458	\$ 62,688	\$ 63,941	\$ 65,220

\$ 57,491	\$ 58,641	\$ 59,813	\$ 61,010	\$ 62,230	\$ 63,475	\$ 64,744	\$ 66,039	\$ 67,360	\$ 68,707
\$ 151,253	\$ 154,278	\$ 157,363	\$ 160,511	\$ 163,721	\$ 166,995	\$ 170,335	\$ 173,742	\$ 177,217	\$ 180,761
\$ 103,383	\$ 105,451	\$ 107,560	\$ 109,711	\$ 111,905	\$ 114,143	\$ 116,426	\$ 118,754	\$ 121,130	\$ 123,552
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
\$ 22,740	\$ 23,195	\$ 23,659	\$ 24,132	\$ 24,615	\$ 25,107	\$ 25,609	\$ 26,122	\$ 26,644	\$ 27,177
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
\$ 139,688	\$ 142,481	\$ 145,331	\$ 148,238	\$ 151,202	\$ 154,226	\$ 157,311	\$ 160,457	\$ 163,666	\$ 166,940
\$ 160,542	\$ 163,752	\$ 167,027	\$ 170,368	\$ 173,775	\$ 177,251	\$ 180,796	\$ 184,412	\$ 188,100	\$ 191,862
\$ 23,344	\$ 23,811	\$ 24,287	\$ 24,773	\$ 25,268	\$ 25,773	\$ 26,289	\$ 26,815	\$ 27,351	\$ 27,898
\$ 53,602	\$ 54,674	\$ 55,768	\$ 56,883	\$ 58,021	\$ 59,181	\$ 60,365	\$ 61,572	\$ 62,804	\$ 64,060
\$ 24,941	\$ 25,439	\$ 25,948	\$ 26,467	\$ 26,997	\$ 27,536	\$ 28,087	\$ 28,649	\$ 29,222	\$ 29,806
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
\$ 154,416	\$ 157,504	\$ 160,655	\$ 163,868	\$ 167,145	\$ 170,488	\$ 173,898	\$ 177,376	\$ 180,923	\$ 184,542

\$ 7,122,797	\$ 7,265,253	\$ 7,410,558	\$ 7,558,769	\$ 7,709,944	\$ 7,864,143	\$ 8,021,426	\$ 8,181,854	\$ 8,345,492	\$ 8,512,401	\$ 7,596,039	\$ 7,747,960	\$ 7,902,919	\$ 8,060,978	\$ 8,222,197
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2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060
1.64	1.67	1.71	1.74	1.78	1.81	1.85	1.88	1.92	1.96	2.00	2.04	2.08	2.12	2.16
\$ 655,637	\$ 668,750	\$ 682,125	\$ 695,768	\$ 709,683	\$ 723,877	\$ 738,354	\$ 753,121	\$ 768,184	\$ 783,547	\$ 799,218	\$ 815,203	\$ 831,507	\$ 848,137	\$ 865,100
\$ 3,857,046	\$ 3,934,187	\$ 4,012,871	\$ 4,093,128	\$ 4,174,991	\$ 4,258,491	\$ 4,343,661	\$ 4,430,534	\$ 4,519,144	\$ 4,609,527	\$ 4,701,718	\$ 4,795,752	\$ 4,891,667	\$ 4,989,501	\$ 5,089,291
\$ 2,532,029	\$ 2,582,670	\$ 2,634,323	\$ 2,687,010	\$ 2,740,750	\$ 2,795,565	\$ 2,851,476	\$ 2,908,506	\$ 2,966,676	\$ 3,026,009	\$ 3,086,530	\$ 3,148,260	\$ 3,211,225	\$ 3,275,450	\$ 3,340,959
\$ 47,921	\$ 48,879	\$ 49,857	\$ 50,854	\$ 51,871	\$ 52,909	\$ 53,967	\$ 55,046	\$ 56,147	\$ 57,270	\$ 58,416	\$ 59,584	\$ 60,776	\$ 61,991	\$ 63,231
\$ 1,106,564	\$ 1,128,695	\$ 1,151,269	\$ 1,174,295	\$ 1,197,781	\$ 1,221,736	\$ 1,246,171	\$ 1,271,094	\$ 1,296,516	\$ 1,322,447	\$ 1,348,896	\$ 1,375,873	\$ 1,403,391	\$ 1,431,459	\$ 1,460,088
\$ 74,336	\$ 75,823	\$ 77,339	\$ 78,886	\$ 80,464	\$ 82,073	\$ 83,714	\$ 85,389	\$ 87,096	\$ 88,838	\$ 90,615	\$ 92,427	\$ 94,276	\$ 96,161	\$ 98,085
\$ 19,860	\$ 20,257	\$ 20,662	\$ 21,075	\$ 21,497	\$ 21,927	\$ 22,365	\$ 22,812	\$ 23,269	\$ 23,734	\$ 24,209	\$ 24,693	\$ 25,187	\$ 25,690	\$ 26,204
\$ 26,721	\$ 27,256	\$ 27,801	\$ 28,357	\$ 28,924	\$ 29,503	\$ 30,093	\$ 30,694	\$ 31,308	\$ 31,935	\$ 32,573	\$ 33,225	\$ 33,889	\$ 34,567	\$ 35,258
\$ 66,525	\$ 67,855	\$ 69,212	\$ 70,596	\$ 72,008	\$ 73,448	\$ 74,917	\$ 76,416	\$ 77,944	\$ 79,503	\$ 81,093	\$ 82,715	\$ 84,369	\$ 86,057	\$ 87,778

\$ 8,386,641	\$ 8,554,374	\$ 8,725,461	\$ 8,899,971	\$ 9,077,970	\$ 9,259,529	\$ 9,444,720	\$ 9,633,614	\$ 9,826,287	\$ 10,022,812	\$ 10,223,269	\$ 10,427,734	\$ 10,636,289	\$ 10,849,014	\$ 11,065,995
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2076	2077	2078	2079	2080	2081	2082	2083	2084		2085	2086	2087	2088	2089
2.97	3.03	3.09	3.15	3.22	3.28	3.35	3.41	3.48		3.55	3.62	3.69	3.77	3.84

\$ 186,086	\$ 189,808	\$ 193,604	\$ 197,476	\$ 201,426	\$ 205,454	\$ 209,563	\$ 213,754	\$ 218,029		\$ 222,390	\$ 226,838	\$ 231,375	\$ 236,002	\$ 240,722
\$ 1,886,525	\$ 1,924,256	\$ 1,962,741	\$ 2,001,996	\$ 2,042,036	\$ 2,082,876	\$ 2,124,534	\$ 2,167,024	\$ 2,210,365		\$ 2,254,572	\$ 2,299,664	\$ 2,345,657	\$ 2,392,570	\$ 2,440,422
\$ 2,937,065	\$ 2,995,807	\$ 3,055,723	\$ 3,116,837	\$ 3,179,174	\$ 3,242,758	\$ 3,307,613	\$ 3,373,765	\$ 3,441,240		\$ 3,510,065	\$ 3,580,266	\$ 3,651,872	\$ 3,724,909	\$ 3,799,407
\$ 169,621	\$ 173,013	\$ 176,473	\$ 180,003	\$ 183,603	\$ 187,275	\$ 191,021	\$ 194,841	\$ 198,738		\$ 202,713	\$ 206,767	\$ 210,902	\$ 215,120	\$ 219,423
\$ 1,720,231	\$ 1,754,635	\$ 1,789,728	\$ 1,825,523	\$ 1,862,033	\$ 1,899,274	\$ 1,937,259	\$ 1,976,005	\$ 2,015,525		\$ 2,055,835	\$ 2,096,952	\$ 2,138,891	\$ 2,181,669	\$ 2,225,302
\$ 164,129	\$ 167,411	\$ 170,759	\$ 174,175	\$ 177,658	\$ 181,211	\$ 184,836	\$ 188,532	\$ 192,303		\$ 196,149	\$ 200,072	\$ 204,073	\$ 208,155	\$ 212,318
\$ 429,233	\$ 437,818	\$ 446,574	\$ 455,506	\$ 464,616	\$ 473,908	\$ 483,386	\$ 493,054	\$ 502,915		\$ 512,973	\$ 523,233	\$ 533,697	\$ 544,371	\$ 555,259
\$ 807,048	\$ 823,189	\$ 839,652	\$ 856,446	\$ 873,574	\$ 891,046	\$ 908,867	\$ 927,044	\$ 945,585		\$ 964,497	\$ 983,787	\$ 1,003,462	\$ 1,023,532	\$ 1,044,002
\$ 11,850	\$ 12,087	\$ 12,329	\$ 12,575	\$ 12,827	\$ 13,083	\$ 13,345	\$ 13,612	\$ 13,884		\$ 14,162	\$ 14,445	\$ 14,734	\$ 15,028	\$ 15,329
\$ 302,403	\$ 308,451	\$ 314,620	\$ 320,913	\$ 327,331	\$ 333,878	\$ 340,555	\$ 347,366	\$ 354,314		\$ 361,400	\$ 368,628	\$ 376,001	\$ 383,521	\$ 391,191
\$ 14,101	\$ 14,383	\$ 14,671	\$ 14,964	\$ 15,263	\$ 15,568	\$ 15,880	\$ 16,197	\$ 16,521		\$ 16,852	\$ 17,189	\$ 17,533	\$ 17,883	\$ 18,241

\$ 8,628,295	\$ 8,800,861	\$ 8,976,878	\$ 9,156,415	\$ 9,339,544	\$ 9,526,335	\$ 9,716,861	\$ 9,911,199	\$ 10,109,423		\$ 10,311,611	\$ 10,517,843	\$ 10,728,200	\$ 10,942,764	\$ 11,161,619
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2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
3.92	4.00	4.08	4.16	4.24	4.33	4.42	4.50	4.59	4.69	4.78

\$ 245,537	\$ 250,447	\$ 255,456	\$ 260,565	\$ 265,777	\$ 271,092	\$ 276,514	\$ 282,044	\$ 287,685	\$ 293,439	\$ 299,308
\$ 2,489,230	\$ 2,539,015	\$ 2,589,795	\$ 2,641,591	\$ 2,694,423	\$ 2,748,311	\$ 2,803,277	\$ 2,859,343	\$ 2,916,530	\$ 2,974,860	\$ 3,034,357
\$ 3,875,395	\$ 3,952,903	\$ 4,031,961	\$ 4,112,601	\$ 4,194,853	\$ 4,278,750	\$ 4,364,325	\$ 4,451,611	\$ 4,540,643	\$ 4,631,456	\$ 4,724,085
\$ 223,811	\$ 228,287	\$ 232,853	\$ 237,510	\$ 242,260	\$ 247,105	\$ 252,048	\$ 257,089	\$ 262,230	\$ 267,475	\$ 272,824
\$ 2,269,808	\$ 2,315,204	\$ 2,361,508	\$ 2,408,739	\$ 2,456,913	\$ 2,506,052	\$ 2,556,173	\$ 2,607,296	\$ 2,659,442	\$ 2,712,631	\$ 2,766,883
\$ 216,564	\$ 220,896	\$ 225,314	\$ 229,820	\$ 234,416	\$ 239,105	\$ 243,887	\$ 248,764	\$ 253,740	\$ 258,814	\$ 263,991
\$ 566,364	\$ 577,691	\$ 589,245	\$ 601,030	\$ 613,051	\$ 625,312	\$ 637,818	\$ 650,574	\$ 663,586	\$ 676,857	\$ 690,394
\$ 1,064,882	\$ 1,086,180	\$ 1,107,904	\$ 1,130,062	\$ 1,152,663	\$ 1,175,716	\$ 1,199,231	\$ 1,223,215	\$ 1,247,679	\$ 1,272,633	\$ 1,298,086
\$ 15,636	\$ 15,948	\$ 16,267	\$ 16,593	\$ 16,924	\$ 17,263	\$ 17,608	\$ 17,960	\$ 18,320	\$ 18,686	\$ 19,060
\$ 399,015	\$ 406,995	\$ 415,135	\$ 423,438	\$ 431,906	\$ 440,545	\$ 449,355	\$ 458,343	\$ 467,509	\$ 476,860	\$ 486,397
\$ 18,606	\$ 18,978	\$ 19,357	\$ 19,745	\$ 20,140	\$ 20,542	\$ 20,953	\$ 21,372	\$ 21,800	\$ 22,236	\$ 22,680

\$ 11,384,852	\$ 11,612,549	\$ 11,844,800	\$ 12,081,696	\$ 12,323,330	\$ 12,569,796	\$ 12,821,192	\$ 13,077,616	\$ 13,339,168	\$ 13,605,952	\$ 13,878,071
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Asset	Years				Replacement \$	Annual budget		
	RCAC	COL staff goal	Budget allow.	Oldest		RCAC	COL	Current
pumps	10	25		60	\$ 500,000	\$ 50,000	\$ 20,000	
reservoirs	30	50		60	\$ 20,000,000	\$ 666,667	\$ 400,000	
pipe	35	100	732	100	\$ 385,000,000	\$ 11,000,000	\$ 3,850,000	
valves	35	50	200	100	\$ 6,000,000	\$ 171,429	\$ 120,000	
mechanical valves	15	50		50	\$ 300,000	\$ 20,000	\$ 6,000	
motor controls/VFDs	10	20		60	\$ 760,000	\$ 76,000	\$ 38,000	
buildings	30	50		60	\$ 30,000,000	\$ 1,000,000	\$ 600,000	
service lines	30	50	100	100	\$ 9,000,000	\$ 300,000	\$ 180,000	
hydrants	40	50	500	100	\$ 20,000,000	\$ 500,000	\$ 400,000	
meters	10	15	25	100	\$ 2,250,000	\$ 225,000	\$ 150,000	
					\$ 473,810,000	\$ 14,009,095	\$ 5,764,000	\$ 1,500,000

FTE CALCULATION TO MEET RECOMMENDED PREVENTATIVE MAINTENANCE SCHEDULE									
Water Operations						Actual	Required		
asset	total quantity	hours	x per year	Employees	task	FTEs	FTEs hrs/yr	FTEs	FTE shortfall
reservoir	10	8	26	2	O&M	0.5	4160	2.5	2.0
hydrant	1202	4	0.5	2	O&M	0.25	4808	2.9	2.7
hydrant	1202	4	0.5	2	flush	0.75	4808	2.9	2.2
hydrant	1202	10	0.01	4	replace	0.25	481	0.3	0.0
pump station	6	2	52	2	O&M	0.5	1248	0.8	0.3
valve	3976	0.25	2	2	exercise	1	3976	2.4	1.4
valve	3976	4	0.025	4	replace	0.25	1590	1.0	0.7
water main	1,100,000	220	3	2	flush	0.5	1320	0.8	0.3
water meter	14537	1	0.1	2	replace	0.5	2907	1.8	1.3
backflow	80	4	1	2	O&M	0.25	640	0.4	0.1
PRV stations	50	20	0.2	3	rebuild	0.25	600	0.4	0.1
PRV	50	1	1	3	O&M	0	150	0.1	0.1
service	14537	10	0.01	4	replace	0.75	5815	3.5	2.8
air release valves	100	4	1	2	O&M	0.25	800	0.5	0.2
emergencies	1	1638	1	4	as needed	4	6552	4.0	0.0
locator	1	1638	1	0.5	1/2 FTE	0.5	819	0.5	0.0
electrician	1	1638	1	0.5	1/2 FTE	0.5	819	0.5	0.0
filter plant	1	1638	1	4	4 FTE	4	6552	4.0	0.0
Total						15	48045	29.3	14.3

	Portland	Longview	Kelso	P/L
People served	970,000	47,000	12,000	20.6
Connections	388,000	14,578	5,082	26.6
Miles of Pipe	2250	208	75	10.8
Employees	600	15	8	40.0
Water produced	35	1.5	0.8	23.3
Average Monthly bill @ 6CCF	\$ 58.04	\$ 34.44	\$ 60.20	1.7
Square Miles	143	28.5	8.8	5.0

				L/P	w/ 29 FTEs	L/P
Connections/employee	647	972	635	1.5	503	0.8
Miles of pipe/employee	3.75	14	9.4	3.7	7	1.9
Water produced/employee	58,333,333	100,000,000	100,000,000	1.7	51,724,138	0.9
Sq. Miles/employee	0.24	1.90	1.10	8.0	1	4.1
Customers/employee	1617	3133	1500	1.9	1,621	1.0

Summary

Note: No evaluation for additional equipment (2 times), administration (1 FTE) and overhead (1 FTE), and engineering support (1FTE)

Efficient asset management can minimize costs – we do not use our asset management plan for work order direction or improving work efficiency, CIP eval, budget, transition plan (longevity is going away),

The ultimate goal of the Asset Management System is to replace infrastructure before failure. We are reacting after failure.

Water/Sewer asset value ~ \$1,000,000,000 – asset health of the system is trending downward

Where to go from here:

1. Identify the full asset obligation
2. Determine level of service and desired asset life
3. Implement plan as efficiently as possible
 - Small projects yield higher \$/unit 3:1 – Large projects can reduce prices
 - buying materials can save \$10/ft +
 - coupling projects with other utilities and street upgrades so restoration costs can be shared across utilities (could save 30% on unit price)
 - identify best use of resources through work order evaluation
 - identify efficient means/methods for implementation based on logistical project parameters,
4. Increase rates to meet goal. – current projection does not raise rates as high as comp cities