

## **SECTION 5**

### **RECOMMENDATIONS AND CAPITAL IMPROVEMENT PROGRAM (CIP)**

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This section presents recommended improvements and capital maintenance for the City of Grants Pass's (City's) water distribution system based on the analysis and findings presented in **Section 4**. These improvements include storage reservoir, pump station, pressure reducing valve (PRV) and water main projects. The capital improvement program (CIP) presented in **Table 5-5** later in this section summarizes recommended improvements and provides an approximate timeframe for project completion. Proposed distribution system improvements are illustrated on Plate 2 Proposed Water System Map in **Appendix A**.

#### **Cost Estimating Data**

An estimated project cost has been developed for each improvement project recommended 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 International (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 use 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 are based upon recent experience with construction costs for similar work in Oregon and southwest Washington and assume improvements will be accomplished by private contractors. Estimated project costs include approximate construction costs and an aggregate 45 percent allowance for administrative, engineering and other project related costs. Estimates do not include the cost of property acquisition. 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 current ENR CCI for Seattle, Washington is 10398 (July 2015).

#### **Water System Capital Improvement Program**

A summary of all recommended improvement projects and estimated project costs is presented in **Table 5-5**. This CIP table provides for project sequencing by showing prioritized projects for the 5-year, 10-year and 20-year timeframes defined as follows:

- 5-year timeframe - recommended completion between 2016 and 2021
- 10-year timeframe - recommended completion between 2022 and 2026
- 20-year timeframe - recommended completion between 2027 and 2036.

## ***CIP Cost Allocation to Growth***

Water system improvement projects are recommended to mitigate existing system deficiencies and to provide capacity to accommodate growth and service area expansion. Projects that benefit future water system customers by providing capacity for growth may be funded through system development charges (SDCs). SDCs are sources of funding generated through development and water system growth and are typically used by utilities to support capital funding needs. SDCs are determined as part of a financial evaluation and are based in part on a utility's current CIP. To facilitate this financial evaluation a preliminary percentage of the cost of each project which benefits future water system growth is allocated in the CIP table. The basis for percentages allocated to growth are described later in this section for each recommended facility and summarized in the CIP **Table 5-5**.

All capital maintenance projects identified through the water facility condition assessment are considered water system performance improvements which benefit all customers. The estimated costs of these improvements are allocated 52 percent to future growth based on the ratio of current to projected future system-wide maximum day demands at saturation development.

## ***CIP Funding***

Subsequent to this Water Distribution System Master Plan (WDSMP), the City will be conducting a financial analysis in support of the water system CIP. The financial analysis, composed of a Water Rate Study and SDC Methodology, will be completed following the WDSMP.

## **Storage Reservoirs**

Based on existing and projected future storage capacity deficiencies presented in **Section 4, Tables 4-2 and 4-3**, several new finished-water storage reservoirs are recommended. Communication infrastructure associated with proposed storage reservoirs must comply with the City's *2015 Water and Wastewater SCADA Systems Master Plan (Carollo)*.

### ***Zone 4 Reservoir No. 13 Replacement (R-13)***

A new 0.7 million gallon (MG) Ausland Reservoir (CIP No. R-13) is recommended to replace the existing undersized Zone 4 Reservoir No. 13. The proposed reservoir would supply existing customers in the Hillcrest neighborhood as well as potential future growth near Ausland and Scenic Drives and Spring Mountain Road. Due to access and site constraints at the existing Reservoir No. 13, it is recommended that the replacement reservoir be constructed on a City-owned site along Ausland Drive as illustrated on Plate 2 in **Appendix A**. Construction on this site would require significant transmission piping as well as a new Zone 4 Ausland Pump Station (CIP No. P-3) discussed later in this section.

Due to the existing storage deficit in Zone 4, the proposed reservoir is recommended for construction within the 5-year timeframe. Estimated project costs for proposed reservoir R-13 are allocated 40 percent to growth based on the ratio of existing to projected future storage capacity deficits in Zone 4.

### ***Conversion from Constant Pressure to Gravity Service Zones (R-14, R-16, R-17)***

New storage reservoirs are proposed in the established Laurel Ridge (4LR), Meadow Wood (2MW) and New Hope (2NH) areas to mitigate projected future capacity deficiencies and provide for anticipated zone expansion to serve new development. Each of these zones is currently served by a constant pressure pump station which does not have adequate redundant fire flow capacity. In lieu of upgrading the existing pump stations, it is recommended that storage reservoirs be constructed to serve these areas by gravity as growth exceeds the recommended 200 equivalent residential unit (ERU) maximum for constant pressure pumped zones. Each of these proposed reservoirs will serve both existing customers and future system expansion. Estimated project costs are allocated to growth as follows:

- R-14 Laurel Ridge Reservoir – 40 percent to growth
- R-16 Meadow Wood Reservoir – 69 percent to growth
- R-17 New Hope Reservoir – 42 percent to growth

These percentages are based on the ratio of storage capacity needed to serve existing customers and projected future storage needs at saturation development, which is also the recommended reservoir capacity.

### ***Zone 2 Reservoir to serve Spalding Industrial Park (R-19)***

The 1.2 MG Pearce Park Reservoir (CIP No. R-19) is proposed to serve the expansion of existing Zone 2 to potential future development in the Spalding Industrial area near the intersection of Redwood Highway (Hwy 199) and Interstate 5 (I-5). Estimated project costs for proposed reservoir R-19 are allocated 100 percent to growth as the reservoir is intended to serve potential future development.

### ***Reservoir Capital Maintenance***

Recent inspection of the structural condition of Reservoir Nos. 4, 6 and 11 identified concerns regarding the condition of these facilities. It is recommended that the City complete a full structural evaluation of all three reservoirs to determine the extent of repairs required to maintain these reservoirs in reliable service. The evaluation should include an analysis of each reservoir's expected performance in a seismic event. The estimated reservoir analysis capital maintenance cost is approximately \$75,000.

## **Pump Stations**

Based on the pumping capacity analysis presented in **Section 4, Table 4-4**, projects are recommended to increase capacity at existing pump stations and construct new stations to serve the City's growing service area. Communication infrastructure associated with proposed pump stations must comply with the City's *2015 Water and Wastewater SCADA Systems Master Plan (Carollo)*.

### ***Fire Flow Capacity Upgrades (P-1 and P-2)***

Upgrades are recommended at the existing Meadow Wood high (3MW) and Panoramic (3P) Pump Stations (CIP Nos. P-1 and P-2 respectively) to provide adequate, redundant fire flow capacity. Due to the existing pump capacity deficit in each zone, the proposed upgrades are recommended for construction within the 5-year timeframe. Projects P-1 and P-2 are considered water system performance improvements which benefit all customers through improved firefighting capacity. Their estimated costs are allocated 52 percent to future growth based on the ratio of current to projected future system-wide maximum day demands at saturation development.

### ***Ausland Pump Station (P-3)***

A new Ausland Pump Station (CIP No. P-3) is recommended to supply the proposed Ausland Reservoir (CIP No. R-13) from existing and proposed Zone 3 water mains on Scoville Road. These facilities will serve existing customers in the Hillcrest neighborhood and potential future development near Ausland and Scenic Drives and Spring Mountain Road. Pump station P-3 construction must coordinate with the Ausland Reservoir which is recommended within the 5-year timeframe to mitigate an existing storage deficiency in Zone 4. The estimated cost of project P-3 is allocated 52 percent to future growth based on the ratio of current to projected future system-wide maximum day demands at saturation development. The Ausland Reservoir, Pump Station and associated transmission improvements will allow the City to abandon Reservoir No. 13, Hefley Pump Station, and the Beacon Drive PRV, when completed.

### ***Zone 4N Pump Station (P-4)***

A new constant pressure pump station (CIP No. P-4) adjacent to the North Valley Reservoir No. 15 is recommended to serve potential future development along Highland Avenue between Morewood Lane and Pony Lane. This area is too high in elevation to be adequately served from existing adjacent North Valley transmission mains. Estimated project costs for proposed pump station P-4 are allocated 100 percent to growth as the station is intended to serve potential future development.

### ***North Valley Pump Station Replacement (P-5)***

Additional capacity is recommended at the existing North Valley Pump Station within the 10-year timeframe. Based on observations during the pump station condition assessment, it appears that capacity cannot be expanded within the existing pump station structure and control system. Thus it is recommended that the existing pump station be replaced with a larger facility to meet projected demands.

The recommended station firm capacity at saturation development is approximately 1,310 gpm, 740 gpm larger than the existing 570 gpm firm capacity at the North Valley Pump Station. The cost of the 740 gpm increase in capacity to serve future development is allocated 100 percent to growth. The cost of the 570 gpm replacement capacity at the proposed pump station is considered a water system performance improvement; the cost of which is allocated 52 percent to future growth based on the ratio of current to projected future system-wide maximum day demands at saturation development.

As discussed in **Section 2**, projected water demands in the North Valley service area are heavily influenced by future development in the proposed Paradise Ranch Resort, thus timing and capacity needs for this pump station replacement should be re-evaluated as development occurs.

### ***Pump Station Capital Maintenance***

Based on the condition assessment previously described in **Section 4**, **Table 5-1** summarizes the major issues noted at each pump station, based on a poor Condition rating and a high Criticality rating. This table also provides an estimate of the cost to complete the recommended repairs or actions. A summary of the Condition, Criticality and Serviceability rating for each component, as well as notes regarding the station assessment and identified issues, is presented in **Appendix D**.

**Table 5-1  
Pump Station Condition Issues Summary**

<b>Pump Station</b>	<b>Component</b>	<b>Issue</b>	<b>Estimated Capital Cost</b>
Madrone	Structure	Structural review recommended to assess building settlement	\$20,000
Champion	Miscellaneous	Isolation valves and pump control valves need replacement – Pumps 1 and 2	\$25,000
Lawnridge	Structure	Structural review recommended for building	\$20,000
	Miscellaneous	Replace failing rubber bellows and install discharge isolation valving	\$12,000
New Hope	Miscellaneous	Repair/replace inoperable exhaust fans	\$3,000
Multiple	Flow meters	Existing flow meter is inoperable at 6 stations. Repair or replace.	\$45,000
<b>Total Estimated Pump Station Capital Maintenance Cost</b>			<b>\$125,000</b>

## **Pressure Reducing Valves (PRVs)**

### ***Future Distribution Looping between Pressure Zones (V-1, V-2, V-3, V-4, V-6)***

PRVs are recommended to provide looping between pressure zones in areas of potential future development including the Spalding Industrial area, Highland Avenue north of Vine Street, Blue Gulch and Fruitdale. Estimated project costs for proposed PRVs V-1, V-2, V-3, V-4 and V-6 are allocated 100 percent to growth as these valve stations are intended to serve potential future development.

### ***10th Street Zone 2 Fire Flow Improvement (V-5)***

A new PRV is recommended to provide improved fire flow to multi-family housing along NE 10th Street south of NE Hillcrest Drive. The proposed 10th Street PRV (CIP No. V-5) would supply water from proposed higher pressure zone mains to Zone 2 fire hydrants in the event of an emergency. There are no existing water mains on this portion of NE 10th Street or NE Hillcrest Drive. Construction of this project must be coordinated with Zone 4 mains on NE Hillcrest Drive (CIP No. M-40) proposed for construction within the 5-year timeframe and future Zone 3 mains (CIP No. M-33). Project V-5 is considered a water system performance improvement which benefit all customers through improved firefighting capacity. The estimated cost of this improvement is allocated 52 percent to future growth based on the ratio of current to projected future system-wide maximum day demands at saturation development.

### ***PRV Capital Maintenance – replace Zone 2A PRVs (V-7)***

The existing Zone 2A PRVs, 9th & Savage and Manzanita, are recommended for replacement as part of the City's capital maintenance program. These valves are the only supply source for customers in Zone 2A thus they are recommended for replacement within the 5-year timeframe.

## **Distribution Mains**

**Table 5-5** presents recommended water main projects for fire flow capacity and system expansion, grouped by service area. This CIP summary table includes estimated project costs and preliminary percent cost allocations to future growth. Detail tables by timeframe for all water main improvements are presented in **Appendix E**. All recommended water main projects are illustrated on **Plate 2** in **Appendix A**.

### ***Distribution Main Cost Estimates***

Water main project costs are estimated based on unit costs by diameter shown in **Table 5-2**.

**Table 5-2  
Unit Cost for Water Main Projects**

<b>Pipe Diameter</b>	<b>Cost per Linear Foot (\$/LF)</b>
8-inch	\$240
12-inch	\$280
16-inch	\$350

*Assumptions:*

1. Includes approximately 45 percent allowance for administrative, engineering and other project related costs
2. Ductile iron pipe with an allowance for fittings, valves and services
3. Surface restoration is assumed to be asphalt paving
4. No rock excavation
5. No dewatering
6. No property or easement acquisitions
7. No specialty construction included, cost estimates for proposed water main projects using trenchless construction methods are described later in this section

*Trenchless Construction Costs*

The recommended CIP presented in **Table 5-5** includes water main projects which involve crossing the I-5 freeway. These projects must be completed using trenchless construction methods, such as, auger boring. Cost estimates for these projects are developed based on MSA’s recent experience with 12-inch diameter and larger trenchless water main construction in Oregon and southwest Washington. Estimates are calculated based on the following:

- Assume bore pits at each end of trenchless alignment, approximate planning-level project cost at \$1,500 per foot of excavated depth, allow 2 feet of depth under casing for equipment
- Steel casing with ductile iron carrier pipe, approximate planning-level project cost at \$40 per inch diameter per LF based on casing diameter
  - 12-inch main (carrier pipe) with 24-inch casing = \$960/LF
  - 16-inch main (carrier pipe) with 36-inch casing = \$1,440/LF

***Water Mains to Improve Fire Flow and System Looping  
(M-1 to M-10, M-34 to M-41, M-45, M-46, M-52, M-78 to M-80, M-84 to M-87)***

As presented in **Section 4**, analysis using the City’s water system hydraulic model revealed few piping improvements are needed to provide sufficient fire flow capacity and adequate service pressure within the existing water service area under existing and projected future demand conditions. These water main projects are considered water system performance

improvements which benefit all customers. Their estimated costs are allocated 52 percent to future growth based on the ratio of current to projected future system-wide maximum day demands at saturation development.

Water main projects M-1 to M-10 are recommended to address fire flow deficiencies under existing conditions. Available fire flow at these locations, anticipated fire flow capacity after improvement and notes regarding project prioritization are summarized in **Table 5-3**.

*10th Street Zone 2 Fire Flow Improvement (M-9 and M-10)*

New 8-inch water mains (CIP No. M-9, M-10) and a PRV (CIP No. V-5) are recommended to provide improved fire flow to multi-family housing along NE 10th Street south of NE Hillcrest Drive. The proposed 10th Street mains would supply water from proposed higher pressure zone mains on Hillcrest to Zone 2 fire hydrants in the event of an emergency. There are no existing water mains on this portion of NE 10th Street or NE Hillcrest Drive. Construction of this project must be coordinated with Zone 4 mains on NE Hillcrest Drive (CIP No. M-40) proposed for construction within the 5-year timeframe and future Zone 3 mains (CIP No. M-33) also on Hillcrest.

**Table 5-3  
Water Main CIP to Address Existing Fire Flow Deficiency**

CIP No.	Location	Approximate Fire Flow (gpm) at 20 psi			Notes
		Required	Modeled Existing	Modeled with Project	
M-1	Redwood Hwy 199 near Henderson Ln	3,000	1,120	3,070	
M-2	Acacia Lane north of E Park Street	1,500	1,330	2,550	Homes on dead end street are isolated on the river's edge with only one accessible hydrant
M-3	NE Olson Drive - Beacon to Piedmont	1,500	1,280 to 1,460	2,000 to 3,950	Main supplies Zone 2 along Piedmont, Oregon and Heritage from Madrone Pump Station. Improves fire flow throughout this area.
M-4 to M-8	Zone 2A Hwy 99, Savage, Manzanita Loop	3,000	2,260 to 2,900	4,620 to 5,100	
M-9 & M-10	10th Street - Zone 2	2,000	870 to 1,190	1,930 to 3,010	Provides fire flow to multifamily housing on existing dead end main and single family on Primrose and Dewey

### *Ausland Pump Station and Reservoir Mains (M-34 to M-41, M-52)*

New 12-inch water mains are needed to connect the proposed Ausland Pump Station (CIP No. P-3) and Ausland Reservoir (CIP No. R-13) to existing Zone 4 customers in the Hillcrest neighborhood. Reservoir R-13 is proposed within the 5-year timeframe to replace the undersized Zone 4 Reservoir No. 13. These water mains (CIP No. M-34 to M-41, M-52) are considered water system performance improvements which benefit all customers. Their estimated costs are allocated 52 percent to future growth based on the ratio of current to projected future system-wide maximum day demands at saturation development.

As the City plans for construction of the Zone 4 I-5 crossing at Cedar Loop (CIP No. M-52) it is recommended that City staff evaluate potential cost savings from installing the parallel Zone 3 pipe casing (CIP No. M-32) at the same time. Both mains are assumed to be installed using trenchless techniques, some economy may be gained by constructing a single bore pit at each end of the alignment to accommodate both casings.

### *Projects for Future System Expansion (M-13 to 33, M-42 to 51, M-53 to 77, M-81 to 83)*

Large diameter distribution main loops are needed to serve partially developed or undeveloped areas within the City's Urban Growth Boundary (UGB) including the Meadow Wood high (3MW), New Hope (2NH) and Blue Gulch (3BG) areas. Future water facilities to serve proposed Zone 2H combining the Harbeck and Hilltop zones are discussed in more detail in **Appendix C** along with proposed facilities for Zone 4N, Spalding Industrial area and Zone 3 and 4 north of I-5. Although many of these piping improvements will be constructed only as development warrants it is prudent for the City to have a long-term plan which sizes proposed facilities for the ultimate anticipated capacity need. Costs for water main projects recommended to facilitate water system expansion are allocated 100 percent to growth.

### *2-inch Main Replacement for Fire Flow (M-88 to M-102)*

Some areas of the Grants Pass existing distribution system are served through 2-inch diameter mains. These undersized mains are not capable of supplying required fire flows and generally do not have adequately-spaced fire hydrants to meet Oregon Fire Code requirements. Water main replacement and additional hydrants are recommended to serve these areas. Areas with 2-inch diameter mains which meet current fire code requirements through nearby hydrants on larger mains are considered to be included in the City's routine pipe replacement program discussed later in this section. Individual 2-inch main replacements projects for fire flow are listed in **Appendix E** and illustrated on **Plate 2 in Appendix A**.

These 2-inch main replacements are considered water system performance improvements which benefit all customers through improved firefighting capacity. Their estimated costs are allocated 52 percent to future growth based on the ratio of current to projected future system-wide maximum day demands at saturation development.

***Distribution Capital Maintenance - Routine Main Replacement Program***

In addition to distribution main projects to address capacity deficiencies, the City should plan for replacement of pipes based on a 100-year life cycle in order to maintain reliable operation, without significant unexpected main breaks and leaks. **Table 5-4** summarizes the total length of pipe for each diameter (size), the replacement diameter and estimated cost to replace all of the mains of that size. While costs will vary for each individual main depending on the piping location, surface conditions, and other constructability issues, this analysis provides a preliminary estimate of the required capital budget to execute an effective and proactive water main replacement program.

The capital maintenance cost for routine main replacement included in this plan is based on the average annual cost for the first 20 years of a 100-year program, approximately \$1.56 million annually. While it is understood that funding at this level for pipeline replacement may not be feasible, it should be recognized that an adequately funded main replacement program is necessary to minimize the risk of failure for critical water system components that will result in significantly greater costs to repair and replace in the future.

**Table 5-4  
Distribution Main Replacement Cost Summary**

<b>Diameter (in)</b>	<b>Approx. Length (miles)</b>	<b>Replacement Diameter (in.)</b>	<b>Estimated Replacement Cost</b>
2	1.3 <sup>1</sup>	8	\$84,000,000
4	1.5		
6	44.3		
8	77.1		
10	8.1	12	\$45,000,000
12	36.1		
14	0.4	16	\$16,000,000
16	11.7		
20	3.6	20	\$6,000,000
24	1.0	24	\$2,000,000
30	1.0	30	\$3,000,000
36	0.01	N/A	N/A
<b>Total Length</b>	<b>186.1</b>	<b>Total Cost</b>	<b>\$156,000,000</b>

*Note:*

1. Total length of 2-inch pipe does not include pipe replacements for fire flow from CIP projects M-88 to M-102.

**Total 20-year Main Replacement Capital Maintenance Cost: \$31,200,000**

## Planning

A water system seismic resilience study for the City is recommended in the next one to five years. The study is intended to identify system vulnerabilities and work towards developing a plan to meet seismic response and recovery goals for water utilities presented in the Oregon Resilience Plan.

It is recommended that the City update this Water Distribution System Master Plan within the next 10 to 20 years. An update may be needed sooner if there are significant changes to the City's water service area, supply or distribution system which are not currently anticipated.

To comply with Oregon Water Resources Department (OWRD) requirements for surface water permit holders Grants Pass is required to complete an update of their Water Management and Conservation Plan (WMCP) every 10 years. The next update of the City's WMCP is expected to begin in 2022.

A water distribution piping corrosion study is recommended within the next 5 years to identify potential pipe materials and installation methods required to minimize corrosion risks in areas where corrosive soils may exist. This study will also provide recommendations for mitigating water main corrosion to extend the life of existing water mains. The timely completion of this study will help the City maximize the life of the distribution system and may reduce the annual capital needs of the Routine Main Replacement Program in the future.

As discussed in Section 4, the City should plan for the implementation of a unidirectional flushing (UDF) program. As part of this WDSMP, a pilot UDF program was developed and tested for Zone 2B. Based on this pilot testing, a recommended budget of \$80,000 is included in the 5-year timeframe of the CIP.

Future water system planning projects are considered water system performance improvements which benefit all customers. Their estimated costs are allocated 52 percent to future growth based on the ratio of current to projected future system-wide maximum day demands at saturation development.

## Summary

This section presented recommendations for improvement, expansion and capital maintenance projects in the City's water distribution system. As presented in **Table 5-5**, the total estimated cost of these projects is approximately \$79.1 million through 2036. Approximately \$39.4 million of the total estimated cost is for projects needed within the 10-year timeframe and \$17 million of these improvements are required in the next 5 years.

**Table 5-5  
Capital Improvement Program (CIP) Summary**

Improvement Category	CIP No.	Project Description	CIP Schedule and Project Cost Summary				Preliminary Cost % to Growth
			5-year	10-year	20-year	Estimated Project Cost	
			thru 2021	2022-2026	2027-2036		
Storage Reservoirs	R-13	0.7 MG Ausland Reservoir - Zone 4 Reservoir No. 13 replacement	\$ 2,100,000			\$ 2,100,000	40%
	R-14	0.5 MG Laurel Ridge Reservoir			\$ 1,500,000	\$ 1,500,000	40%
	R-16	1.3 MG Meadow Wood Reservoir		\$ 3,900,000		\$ 3,900,000	69%
	R-17	1.2 MG New Hope (Cathedral Hills) Reservoir		\$ 3,600,000		\$ 3,600,000	42%
	R-19	1.2 MG Pearce Park Reservoir - Zone 2 Spalding Industrial Park			\$ 3,600,000	\$ 3,600,000	100%
		Capital Maintenance	\$ 75,000			\$ 75,000	52%
		<i>Subtotal</i>	\$ 2,175,000	\$ 7,500,000	\$ 5,100,000	\$ 14,775,000	\$ 9,282,000
Pump Stations	P-1	Meadow Wood P.S. high (Zone 3MW) - fire flow capacity upgrade	\$ 250,000			\$ 250,000	52%
	P-2	Panoramic P.S. - fire flow capacity upgrade	\$ 400,000			\$ 400,000	52%
	P-3	Ausland P.S. supplying proposed Ausland Reservoir (R-13)	\$ 500,000			\$ 500,000	52%
	P-4	Zone 4N P.S. - constant pressure			\$ 1,200,000	\$ 1,200,000	100%
	P-5	North Valley P.S. replacement		\$ 1,000,000		\$ 1,000,000	79%
		Capital Maintenance	\$ 125,000			\$ 125,000	52%
		<i>Subtotal</i>	\$ 1,275,000	\$ 1,000,000	\$ 1,200,000	\$ 3,475,000	\$ 2,654,145
PRVs	V-1	Spalding Industrial Area - Ament Rd PRV			\$ 150,000	\$ 150,000	100%
	V-2	Zone 4N Highland Ave PRV			\$ 150,000	\$ 150,000	100%
	V-3	Blue Gulch PRV			\$ 150,000	\$ 150,000	100%
	V-4	Overland PRV			\$ 150,000	\$ 150,000	100%
	V-5	10th Street PRV	\$ 150,000			\$ 150,000	52%
	V-6	NW B Street PRV			\$ 150,000	\$ 150,000	100%
	V-7	Zone 2A PRV replacements (Capital Maintenance)	\$ 250,000			\$ 250,000	52%
		<i>Subtotal</i>	\$ 400,000	\$ -	\$ 750,000	\$ 1,150,000	\$ 958,000
Distribution Mains	M-1, 2, 3, 9, 10	Piping improvements for fire flow	\$ 683,000			\$ 683,000	52%
	M-4 to 8	Zone 2A - Hwy 99, Savage, Manzanita Loop	\$ 758,000			\$ 758,000	52%
	M-11, 12	Proposed Zone 2H - connect Harbeck and Hilltop			\$ 532,000	\$ 532,000	100%
	M-13 to 22	Spalding Industrial Area - Zone 2 expansion			\$ 3,181,000	\$ 3,181,000	100%
	M-24, 25, 26	Zone 3 Granite Hill to Scoville Loop			\$ 1,415,000	\$ 1,415,000	100%
	M-27 to 30	Zone 3 Scoville to Spring Mountain Loop			\$ 1,107,000	\$ 1,107,000	100%
	M-31 to 33, 42	Zone 3 I-5 crossing at Cedar Loop, Spring Mountain to Hillcrest Loop			\$ 1,396,000	\$ 1,396,000	100%
	M-34 to 41, 52	Proposed Ausland P.S. (P-3) and Reservoir (R-13) mains	\$ 2,897,000			\$ 2,897,000	52%
	M-43, 44	Zone 3 I-5 crossing at Humane Society			\$ 570,000	\$ 570,000	100%
	M-45, 46	Zone 3 Vine Street Loop - Highland to Hawthorne			\$ 996,000	\$ 996,000	52%
	M-47 to 51	Zone 4N mains			\$ 1,996,000	\$ 1,996,000	100%
	M-53 to M-57	Zone 1 Spalding Industrial Area loop			\$ 1,362,000	\$ 1,362,000	100%
	M-58 to 62	Meadow Wood future mains		\$ 1,173,000		\$ 1,173,000	100%
	M-63 to 68	New Hope future mains		\$ 2,532,000		\$ 2,532,000	100%
	M-69 to 75	Laurel Ridge and Blue Gulch future mains			\$ 1,870,000	\$ 1,870,000	100%
	M-76, 77, 81, 82, 83	Zone 1 Fruitdale future mains			\$ 2,087,000	\$ 2,087,000	100%
	M-78, 79, 80	Zone 1 Looping- Cloverlawn & Grandview		\$ 639,000		\$ 639,000	52%
	M-84 to 87	Existing system looping		\$ 955,000		\$ 955,000	52%
	M-88 to M-102	2-inch main replacement for fire flow	\$ 696,000	\$ 770,000	\$ 420,000	\$ 1,886,000	52%
		Routine Main Replacement Program (Capital Maint.)	\$ 7,800,000	\$ 7,800,000	\$ 15,600,000	\$ 31,200,000	52%
		<i>Subtotal</i>	\$12,834,000	\$13,869,000	\$ 32,532,000	\$ 59,235,000	\$ 40,028,280
Planning		Seismic Resilience Study	\$ 100,000			\$ 100,000	52%
		Water Management & Conservation Plan update		\$ 50,000		\$ 50,000	52%
		Water Distribution System Master Plan update			\$ 150,000	\$ 150,000	52%
		Unidirectional Flushing (UDF) Program Development	\$ 80,000			\$ 80,000	52%
		Distribution Piping Corrosion Study	\$ 100,000			\$ 100,000	52%
		<i>Subtotal</i>	\$ 280,000	\$ 50,000	\$ 150,000	\$ 480,000	\$ 249,600
<b>Capital Improvement Program (CIP) Total</b>			<b>\$16,964,000</b>	<b>\$22,419,000</b>	<b>\$ 39,732,000</b>	<b>\$ 79,115,000</b>	<b>\$ 53,172,025</b>
			<b>Annual Average CIP Cost</b>				
			<b>\$3,392,800</b>	<b>\$3,938,300</b>	<b>\$3,955,750</b>		
			<b>5-year</b>	<b>10-year</b>	<b>20-year</b>		