City of Ouray
Water Efficiency Plan

Prepared for:

The City of Ouray
P.O. Box 468
Ouray, CO 81427

Colorado Water Conservation Board
1313 Sherman Street, Room 721
Denver, CO 80203

Wright Water Engineers, Inc.

September 2014

051-036.100

COLORADO
Colorado Water
Conservation Board
Department of Natural Resources

1313 Sherman Street, Room 721
Denver, CO 80203

September 29, 2014

Patrick Rondinelli
City of Ouray
P.O. Box 468
Ouray, CO 81427

Dear Mr. Rondinelli:

On September 17, 2014, the Colorado Water Conservation Board (CWCB) received a locally adopted Water Efficiency Plan from the City of Ouray for review and approval. The CWCB has determined the Plan to be in accordance with §37-60-126 and the CWCB's Guidelines for the Office to Review Water Conservation Plans Submitted by Covered Entities. The Plan is hereby ***approved*** and Ouray may proceed with its implementation.

The Plan will be kept on file at the CWCB and shall be accessible to the public through our website and the Water Resource Information Center. The Plan will also be made available to the Colorado Water Resources & Power Development Authority and the Finance section within the CWCB should you apply for a loan from either agency.

As Ouray begins implementing the efficiency measures outlined in the Plan, please know that the CWCB staff will be available to provide technical and financial assistance.

Thank you again for all your efforts in developing a Water Conservation Plan. Should you have any questions or need additional assistance, please feel free to contact Kevin Reidy at 303-866-3441 ext 3252.

Sincerely,

Rebecca Mitchell

Rebecca Mitchell
Section Chief, CWCB Water Supply Planning

cc: Ann Morgenthaler, City of Ouray
Peter Foster, Wright Water Engineers
Ryan Huggins, Wright Water Engineers
Mike Brod, Colorado Water Resources & Power Development Authority
Kirk Russell, Colorado Water Conservation Board

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1.0 EXECUTIVE SUMMARY

The City of Ouray (City) has completed and adopted this Water Efficiency Plan (Plan) in order to evaluate, prioritize and implement water efficiency activities. The goals of these activities are to provide data to the City on system operations, to reduce system losses, to develop estimates of the avoided costs as a result of increased efficiencies, and to increase public awareness and support for the efficiency activities. The Plan focuses on foundational activities that are proposed to be implemented by the City for the main water supply infrastructure. The City will also consider implementation of education and outreach measures. The City plans to lead by example and implement water savings measures such as fixture retrofits and irrigation efficiencies, as feasible. The implementation of the Plan will help the City to improve water demand forecasts, plan for infrastructure needs, and manage its water demands within its physically and legally available water supply. The goals, screening, evaluation of measures, and implementation plan are shown in Appendices A through F. All of the measures are voluntary and are subject to City Council approval and budget constraints over the planning period. Through this Plan, the City is demonstrating leadership to other small communities in Colorado.

2.0 PROFILE OF EXISTING WATER SYSTEM

2.1 Overview of Existing Water Supply System

2.1.1 Service Area

The City provides treated water to a service area of approximately 615 acres, encompassing the City as well as three subdivisions outside of the city limits: 1) Pinecrest, 2) Whispering Pines, and 3) Panoramic Heights (which includes smaller subdivisions within). The City also provides raw water to the Mineral Farms Subdivision, which has its own water treatment and distribution system (see Map 1).

2.1.2 Water Supply Sources

The City's primary water source, Weehawken Spring, located in the Canyon Creek drainage (see Map 1). Weehawken Spring and Pipeline are decreed for 7.632 cubic feet per second (cfs) for domestic and fire uses and is associated with a storage water right. Weehawken Spring is also an alternate point of diversion for up to 5.2 cfs of more senior water decreed to Oak Creek Supply Line (see Table 1). Weehawken Spring provides water for both non-potable and potable uses.

Treated Weehawken Spring water is used as the main drinking source throughout the service area. The City has additional surface and storage water rights that can be used to provide water supply as needed and as physically available (see Table 1).

Geothermal water for the Ouray Hot Springs Pool is derived from numerous water rights for springs and wells located in the city. This Plan focuses on the non-geothermal water supply at this time.

2.1.3 Key Existing Facilities

Water from Weehawken Spring is collected by three pipelines that flow into a concrete vault. The concrete vault contains an overflow pipe that discharges excess water to Canyon Creek. From the vault, water is conveyed through approximately 2.5 miles of 10-inch transmission line to two 500,000 gallon storage tanks. Prior to reaching the storage tanks, a portion of the flow from Weehawken Spring is diverted at the Mineral Farms Subdivision, which has its own water treatment and distribution system. There is no measurement device at the water source or at the transmission line to the Mineral Farms Subdivision. A second pipeline runs from Mineral Farms to the storage tanks in order to provide system redundancy.

The two storage tanks function as one unit. Excess raw water in the tanks exits the older tank through a pipe directly into the Uncompahgre River. At this time, the tanks are adequate to capture all water needed by the City for use. In the future, additional storage may be added which would reduce overflow to the river. At the outlet of the storage tank, prior to treatment, a tee provides water to the Ice Park in the winter. There is also a dedicated line to a micro-hydro plant that generates power when temperatures are above freezing and there is water supply available after the City's potable demands have been met. The potable water is treated using chlorine gas prior to distribution. There are four meters in the chorine shed that monitor: 1) inflow to the tanks, 2) outflow to the City (two meters), and 3) outflow to the Ice Park/micro-hydro station.

There are two pipelines for outflow to the distribution system in order to provide redundancy in the event of a pipe failure. The system now uses both pipelines during normal operations.

The water distribution system in the City consists of approximately 11 miles of pipeline. The main water distribution lines, including the lines from the water supply to the treatment and distribution system are shown on Map 1. The system currently serves approximately 1,400 taps, and has 90 fire hydrants and 12 pressure reducing valves (PRVs). The system has three main pressure zones: 1) the Jim Brown Zone, 2) the Center of Town Zone, and 3) the North Zone. PRVs are used to adjust pressure between the three zones. The PRV locations are shown on Map 1. The Jim Brown Zone serves an elevation range from 7,735 to 7,970, the Center of Town Zone serves an elevation range from 7,680 feet to 7,830 feet, and the North Zone serves an elevation range from 7,590 feet to 7,760 feet (Boyle Engineering Corp., 2003).

After use, water is discharged through the sewer lines to the Wastewater Treatment Plant (WWTP), which has a capacity to treat approximately 363,000 gallons per day (gpd). The WWTP consists of two aerated lagoons with a total surface area of approximately 1.2 acres (see Map 1). The City's WWTP provides service within the city limits, Pinecrest, and Panoramic Heights. The Whispering Pines and Mineral Farms subdivisions utilize on-site waste water treatment systems.

2.2 Water Supply Reliability

The Colorado Water Conservation Board (CWCB) prepared the Statewide Water Supply Initiative (SWSI) in 2004 to identify current and future water needs to the year 2030 and to examine water supply projects that will help to meet future demands. In 2010, the CWCB updated the SWSI to consider future water demands to the year 2050, to identify non-consumptive needs in each major basin, to assess available water supply in Colorado, and to discuss identified projects to further meet future demands.

The 2004 SWSI identifies a water supply gap of 150 acre-feet per year by the year 2030 for the City of Ouray. The report states, "Approximately 25 percent of increased demand may require augmentation based on potential downstream calls" (Colorado Water Conservation Board, 2004). While the 2010 SWSI report does not specifically address the City, the report does identify a 300 acre-foot per year water supply gap for Ouray County by the year 2050 (Colorado Water Conservation Board, 2010).

Historically, the City has not experienced issues with physical water supply yield, even during periods of drought. However, the City's water supply has recently been subject to administration by more senior water rights in very dry years (see Section 2.3). As new measurement devices (i.e. meters and flumes) and data collection systems (i.e., SCADA) are available to the City, future water use records may provide more accurate yield estimates and provide data to promote water efficiency measures.

2.3 Supply-Side Limitations and Future Needs

Non-revenue water can be grouped into two categories; water that is put to use but not billed and water that is lost due to system infrastructure. Lack of meters in the City makes it difficult to estimate the amount of non-revenue water going to dust suppression on City streets, hot springs pool cooling, leaks and system losses, or other uses. Future water demands and potential supply-side limitations should be revisited when additional data is available. This Plan aims to help the City manage water demands within its legal and physical water supply.

As stated above, the City has not historically experienced issues with water supply yield. However, during extremely dry years (e.g., 2002 and 2012), the City's water supply has been susceptible to administration by the Colorado Division of Water Resources (CDWR). In 2012, the City diverted water under an Emergency Substitute Water Supply Plan. To secure its water supply, the City is working to obtain a water augmentation plan for use when the City's potable and non-potable water rights are curtailed during dry years.

3.0 PROFILE OF WATER DEMANDS AND HISTORICAL DEMAND MANAGEMENT

The City does not meter individual taps and instead relies on Equivalent Residential Units (EQRs) surveys to account for water use. One EQR represents a single family home with an assumed water demand of 350 gallons per day. The City charges a flat rate for water use per EQR. Due to lack of individual metering data, this Plan bases the City's demands on EQRs and does not include estimates of non-revenue water.

3.1 Demographics and Key Characteristics of the Service Area

3.1.1 Customer Categories

Based on an EQR survey of taps performed by the City in 2005, the City provides treated water to the following customer categories: single family homes, multi-family homes, irrigation, lodging, city offices, churches, restaurants, and retail and office space (see Table 2). Single family homes are considered one EQR; the remaining categories are assigned an EQR value based on estimated water use (see Appendix G). The City also provides treated water for dust suppression and cleaning City streets, which are not included as EQR categories and thus are considered non-revenue water. The "City Offices" category includes 50 EQRs assigned to the hot springs pool and results in a large demand for City offices in this analysis. The City provides treated water for filling and cooling, as needed, and for the bathroom and shower facilities at the pool.

The non-potable water for the micro-hydro plant and Ice Park are measured at the storage tank meters and can be separated from the treated water that enters the distribution system.

3.1.2 Population Statistics

Based on population data from the Colorado Department of Local Affairs (DOLA), the City's 2010 population was approximately 1,000 people. A summary of the City's population from 1990 through 2010 is provided in Table 3. The average annual population increase over the 21 year period is 2.3 percent. In addition to City residents, the City provides treated water to three subdivisions outside city limits, which are not included in the population values. The City is a tourist destination and serves many non-residents, which are reflected in the lodging and restaurant EQRs.

3.2 Historical Water Demands

The City's 2005 EQR survey is the basis for historical demand analysis, as discussed below.

3.2.1 Annual Water Demands

The City charges for water delivery on an EQR basis, as discussed above. Based on a 2011 survey, there are 1,338 EQRs in the City. At a rate of 350 gallons per day per EQR, the total

system demands are approximately 171 million gallons per year or 525 acre-feet per year based on 1,338 EQRs.

3.2.2 Approximate Water Use by Customer Category

Table 2 and Figure 1 provide an approximate breakdown of EQRs by sector based on a survey performed by the City in 2005. Single family and multi-family homes represent the highest water demand for the City, at a combined 71 percent of the EQRs. Further refinement of the EQR sectors and an updated survey are discussed in Section 5.2.1.

3.3 Past and Current Demand Management Activities and Impact to Demands

During the 2012 drought period, the City issued a resolution requesting citizens to curtail using water for irrigation uses (see Appendix H). Other existing demand management activities include increases to water rates, a Capital Improvement Plan (Boyle Engineering Corp., 2003) and bill stuffers (See Appendices A through D). Due to the lack of data, it is not feasible to quantify the effects on water demands that these activities have had to date.

3.4 Demand Forecasts

The City is working on an augmentation plan that addresses long term development based on current EQRs and the 2.3 percent growth rate for 50 years. Outdoor irrigation demands were also estimated for the long-term forecast. Based on these assumptions, the City's total water demand in 2063 is estimated to be 1,825 acre-feet per year (see Table 4). The City may have additional demands due to hot-springs cooling, dust suppression or other uses that are not currently accounted for.

The demand forecast is based on year-round, 100 percent occupancy in order to conservatively plan for water supply needs. The peak demands based on current tourism patterns may be addressed in the Capital Improvement Plan in order to refine analysis of infrastructure needs, such as peak demand storage.

4.0 INTEGRATED PLANNING AND WATER EFFICIENCY BENEFITS AND GOALS

4.1 Water Efficiency and Water Supply Planning

In order to remain compliant with debt covenants, the number of major capital improvements that can be financed in the City budget are limited. This restriction is currently applicable due to significant capital improvements completed in recent years. Current water projects managed by the City include firming the legal water supply through water rights work, installation of a micro-hydro system on the water mains, and installation of a meter and backflow prevention for the Panoramic Heights subdivision. By completing the proposed foundational water activities, such as a Capital Improvement Plan update, future operations, maintenance, repairs and improvements can occur on budget and within a reasonable time frame.

Incorporation of water efficiency into water supply planning can have beneficial financial outcomes for the City as a water supplier, including elimination, downsizing, or postponement of water supply system projects. Currently, the costs for implementing the Plan and the cost savings associated with the efficiencies cannot be accurately estimated due to lack of metering data.

4.2 Water Efficiency Benefits

In addition to water supply benefits, a Water Efficiency Plan may also have positive economic, societal, and environmental impacts for the City. For example, the City's hot springs pools' electrical demands are powered by a micro-hydro plant using non-treated water from Weehawken Spring. By increasing efficiency and lowering demands for municipal system uses, more water will be available to deliver to the micro-hydro system, creating income and renewable energy. Better documentation of water use, decreased water demands, and improved forecasted water demands will result in the following benefits for the City:

- Decreased volume of treated water and associated treatment chemicals.
- Decreased operational costs related to reducing the volume of treated and delivered water. This may include replacement costs, requirements to increase or expand treatment or delivery capacity, or power costs.

- Efficiency measures will help to keep water demands within the City's current water rights and physical water supply availability.
- Potentially increased volume of non-treated water available for hydro-power use.
- Potentially increased instream flow in the Uncompahgre River.

This Plan and the associated measures demonstrate the City's effort to manage its water resources responsibly.

4.3 Water Efficiency Goals

The City's Water Efficiency Plan will be an iterative process beginning with building data and management tools and meeting foundational goals before setting more ambitious and specific water efficiency goals (see Section 7.3 Review and Update). Lack of accurate water use data makes it difficult to set quantitative goals based on water savings. The qualitative goals for the City of Ouray Water Efficiency Plan are as follows:

1. *Better Water Use Data Collection and Monitoring.* Develop a plan to improve monitoring of the main components of system infrastructure in order to document water uses and non-revenue water (including both non-revenue water that is used and non-revenue water due to system losses). This plan will focus on adding measurement devices to the system infrastructure in locations that will allow for tracking overall water delivery and identify data discrepancies that may be due to leaks or non-revenue uses. This does not include individual meters for end-users. This goal will be measured by the City's improved ability to track the water use through the main infrastructure points of the system and the use of this data towards reaching the remaining goals.
2. *Assess Costs for System Operations.* The City will be able to estimate the incremental cost for treating and delivering water based on the system measurement devices (see Goal 1), system operational costs, capacity data and water rights considerations. This will primarily be accomplished through an update to the Capital Improvement Plan. This will allow the City to quantify the cost-savings of efficiency measures on a broad scale, which is an important factor in planning for City infrastructure growth and maintenance. The success of this measure will be determined by installing system meters and installing measuring devices

on water supply and wastewater infrastructure, data collection and analysis, and an update to the Capital Improvement Plan.

3. *Decrease System Losses.* Implement measures to help to detect and track system losses enabling the City to ultimately decrease losses. This goal may be achieved through multiple activities including identifying non-metered sources, leak detection, winterization and/or other efficiency measures. This goal should be completed subsequent to adding measurement devices to the main system and analyzing data in order to identify the most likely loss locations within the system. The lack of current data on amount of system losses prohibits quantifying this goal at this time.

4. *Public Awareness and Acceptance.* Through education, outreach, and leading by example, the City will create awareness amongst the public of the importance of water conservation and support for water efficiency activities. Studies indicate that educational measures can reduce individual water use by up to 5 percent (Barta, 2004). Indications for the success of this goal include public support for funding and implementation of the proposed efficiency activities through the Public Works Budget, as well as implementation and voluntary conservation measures.

The first water efficiency goal for the City focuses on accurate data collection of system operations and losses. The information from the first goal will contribute to achieving goals number 2, 3 and 4. All four water efficiency goals are used to screen and evaluate the potential water efficiency measures, as discussed below.

5.0 SELECTION OF WATER EFFICIENCY ACTIVITIES

An extensive list of water efficiency activities is required to be evaluated for implementation as part of the Plan per C.R.S. 37-60-126 (1-4 and 5) and the Guidebook of Best Practices for Municipal Water Conservation in Colorado (Aquacraft Inc., 2010). The City is smaller than the minimum municipality size required to comply with this State statute. Nonetheless, the City has considered all of the measures that are practical and appropriate. The lists and evaluation results are included in Appendices A through E2.

5.1 Summary of Selection Process

Water efficiency activities were screened using the following initial qualitative criteria:

- Contributes to the City's qualitative goals, as described in Section 4.3 of this Plan.
- Additional pros and cons:
  - Appropriateness of measure given the City's infrastructure and lack of individual meters.
  - Feasibility based on financial and staff resources.
- Prioritization of foundational activities.

City staff provided review and input on the candidate measures as well as a sense of the political and public views in the City that are relevant to water conservation. Overall, the City desires to lead by example and to encourage voluntary conservation over enforcement measures or creating efficiency programs required to be administered by the City.

After screening all of the potential activities, 11 measures were moved forward for detailed evaluation. The detailed evaluation includes a qualitative and quantitative analysis, to the extent feasible, of each measure (see Appendices E1 and E2). A ten year planning period was assumed as a practical means of evaluation. Cost estimates were based on materials, contracts, and/or staff time requirements. The total estimated cost for all measures is $2.6 million. Of this total, $2.4 million is solely for water line replacement. Water savings were estimated on the basis of a percentage of savings over current water deliveries. The total estimated water savings for all proposed measures, over the ten year period, is 208.3 million gallons.

The cost-benefit of each proposed measure was estimated as a dollar per thousand gallons saved basis. Cost ranged from $0.0006 to $18.15 per thousand gallons saved. Education measures had the lowest cost while infrastructure upgrades had the highest costs (see Appendix E2). In addition to the cost-benefit information in Appendix E2, factors in the priorities for implementation of measures include benefits to overall system operations and management and providing information for understanding current water uses and future demands.

City staff reviewed the 11 measures for feasibility, for overall consistency, and for appropriateness for the City of Ouray. The measures are complimentary and should be undertaken in the order recommended in Section 6 to help the City meet its water efficiency goals. The implementation of measures is voluntary and will continue to be subject to Council approval and budget constraints.

5.2 Demand Management Activities

The recommended Demand Management activities, which are based on screening and evaluation, primarily focus on proposed foundational activities to better estimate the City's water use and delivery. The City also evaluated educational opportunities that may be feasible at this time. The City discussed ordinances and technical incentives as a whole, but these measures were not considered appropriate for the City to implement at this time.

5.2.1 Foundational Activities

The total estimated water savings for the proposed foundational activities over the ten-year planning period is approximately 185 million gallons. The foundational activities were screened and the following were selected for further evaluation (see Appendix A). The evaluation of measures provides information on the potential cost and savings associated with the proposed activity. City Council approval and meeting budgetary constraints are necessary to implement measures (see Section 6).

Water Rate Adjustments

The City's existing budget process incorporates a two percent increase to water rates on an annual basis, pending annual review by the Public Works Department and final approval by City Council. The intention of this rate increase is to allow the Public Works Department to keep up with system costs while maintaining a balanced utilities budget and avoid larger annual increases to customer rates. The rate increase also allows the Public Works Department to build a fund balance that can be used to finance capital improvement projects. This rate adjustment will be incorporated into the analysis in the Capital Improvement Plan when estimating the revenue available to the Public Works Department. A change in rate structure based on use by individual taps is not supported by the public at this time and is not recommended as individual taps are not metered.

The City maintains a list of EQRs for billing purposes. It is recommended that the City analyze the EQR list by customer use sector to better understand the water demands for the system. This analysis should create a separate category for the Hot Springs Pool and include both the filling and cooling water as well as use for bathrooms, showers and facilities at the pool. A new survey

can identify sectors that are not metered, such as park watering or dust suppression, in order to promote measurement of these uses for future management of the system.

Control of Apparent Losses (Development and Implementation of a Water Measurement Plan)

This measure proposes that the City will develop and implement a Water Measurement Plan to track water supply and usage at water sources and locations within the water delivery system, hot springs system and wastewater system. The Water Measurement Plan will support implementation of subsequent water conservation measures as well. The Water Measurement Plan will benefit the City's water rights and meet legal obligations for maintaining measurements in addition to improving system efficiency.

The measure proposes to complete in the first year the Water Measurement Plan which will build on the initial inventory of measurement locations and existing or proposed measurement devices and data logging devices. The City will engage in further work for each location to prioritize measurements, specify the type of equipment needed as for measurement, recording, and to develop costs for implementation. The measurement plan will also specify how the measuring devices will record data and be integrated into the City's SCADA system and water usage analysis. The City will seek funding to implement the Measurement Plan over the period of this Water Efficiency Plan. The water savings from this proposed measure will be realized in the System Water Audit. The estimated cost for development of the Measurement Plan is $45,000 and the implementation of the plan is an estimated $1,000,000. These costs are preliminary and subject to revision during the ongoing process of planning and implementation.

System Water Audit (for Primary System Infrastructure)

The City's improved capacity to observe changes in instantaneous flow as well as track volumes of water over time will help to track total system demands and use, determine use patterns within areas of the system, and identify potential leaks or losses. Areas of the system with a discrepancy between calculated demands and actual water usage will be targeted for further investigation into leaks, losses, or unmetered use. System audits are recommended in order to see the gains in system efficiency estimated through installation of system measurement devices (see above).

Leak Detection Study

This measure proposes that the City hire a contractor to perform a leak detection survey on the eleven miles of ductile iron pipe in its main distribution system. If funds allow, the older portion of the transmission line from the water source to the system may be inspected as well. The results of this investigation will be integrated into the Capital Improvement Plan and addressed as soon as feasible. The estimated cost of the leak detection study is $18,500 (see Appendix I for details).

Water Line Replacement Program

To provide for more of the ongoing maintenance and replacement needs, an annual budget item to contract for the replacement of water lines is proposed to be included in the Public Works budget. This measure proposes that 2,500 feet of pipe is replaced each year. This program will also be integrated into the Capital Improvement Plan. This measure is the most expensive, at a total of $2.4 million over ten years. However, given the age of existing lines, replacement is necessary to maintain the system over time. Adjustments to the extent of replacement and frequency of replacement may be made, as needed, to meet City budgets and approvals.

Capital Improvement Plan (existing – to be updated)

The City completed a Water Infrastructure Master Plan in 2003 (Boyle Engineering Corp., 2003). This measures proposes that the City will update the document to incorporate work completed since 2003, newly identified infrastructure needs, current and forecasted Public Works Department budgets, and the annual water line replacement program. Once updated, City staff will oversee the budgeting and implementation of the Plan throughout the planning period. The estimated cost for updates to the Capital Improvement Plan is $18,750. By expending funds for this measure first, the Capital Improvement Plan can inform the budget process in future years to address all other proposed measures.

5.2.2 Targeted Technical Assistance and Incentives

City staff reviewed information on several of the incentive and technical assistance measures (see Appendix B). No measures were selected for detailed evaluation or implementation at this

time. The activities considered under incentive measures may be implemented by the City on its own properties to provide a leading example and offer demonstration sites (see Section 5.2.4). Reasons for elimination of technical assistance measures include:

- There is very limited irrigated area in the city and automation of irrigation is not common and may not be cost-effective.
- Establishing, advertising, and managing a rebate program for installation of water efficient fixtures would require significant City staff resources. Given the small population size of the City, these types of program are not practical and would not likely have a sufficient water savings benefit for the cost.
- Some measures or associated cost savings to individuals are not feasible without individual tap meters. At this time, the City is not proposing to install individual tap meters.

5.2.3 Ordinances and Regulations

The City is focused on water conservation through foundational activities and through encouragement and education of water users. It is noted that the City Code, §9-11 states that "it shall be unlawful to waste water." This section of code also includes irrigation restriction measures the City vote to implement in case of drought. This section appears to support the City's authority to promote efficiency and eliminate water waste. No new ordinances or regulations were considered at this time (see Appendix C).

5.2.4 Education Activities

The total estimated water savings for the proposed educational measures over the ten-year planning period is approximately 23 million gallons. The screening of educational activities is shown on Appendix D and selected voluntary measures are summarized below.

Bill Stuffers

The City sends billing to customers once per year, and proposes to continue to provide water conservation information with the mailings. City staff will prepare information sheets for inclusion in the mailings. The estimated cost for Bill Stuffers on an annual basis over 10 years is $6,500.

Newspaper Articles

The City has an established relationship with the local newspaper. City staff may work with the paper to provide educational information on water conservation and City water issues to the public. This measure proposes that the newspaper will print one article per quarter on water conservation subjects. The estimated cost over the planning period is $5,600.

Web Pages and Social Media

This measure proposes that City staff provide quarterly updates to the City's website on conservation and voluntary measures. Additionally, City staff will address water conservation education and City water issues on its existing social media accounts. The estimated cost for all social media management for water education is $9,800 over ten years.

City Demonstration Activities and Public Presentations

The City may implement various measures in order to conserve water and provide educational opportunities. These voluntary measures may include rain-sensor controlled irrigation in City parks, low-flow fixtures that meet EPA WasterSense specifications, or low water demand landscaping, such as xeriscaping. These efforts will be integrated with ongoing City maintenance, repairs and development of new projects. The successful water efficiency measures implemented by the City may provide a basis for developing guidelines or policies in the future,

City staff proposes to make a presentation during two City Council meetings per year on water efficiency progress and City water issues. It is anticipated that at least one of these meetings will update the Council on water use data from new measurement devices and analyses on the non-revenue water in the system. These meetings are open to the public and are attended by decision-makers for the implementation of water efficiency measures. Based on a materials and staff time, the cost for this measure is approximately $7,100 over ten years.

Customer Water Use and Landscape Design and Maintenance Workshops

This measure proposes that the City will host water-use and landscape design workshops approximately once every three years. The workshops will combine indoor water efficiency with

water efficient landscape design and maintenance information in order to reach a broader audience. These events may be in combination with other city-wide outreach activities, such as Spring Cleanup. Regional watershed groups, private business and volunteers may be able to provide assistance in the workshops. The estimated cost for this measure is $3,700 over ten years.

6.0 IMPLEMENTATION AND MONITORING PLAN

6.1 Implementation Plan

The plan for implementation of the proposed water efficiency activities identifies key steps for implementation (i.e., milestones) and the parties responsible for implementation (see Appendix F). The implementation plan proposes that all measures be implemented for the water efficiency benefits, as well as the overall benefits to system operations and management of the City's water resources. The preliminary estimated costs for each activity are shown in Appendix F and total $2.7 million dollars over ten years (of which, $2.4 million is for water line replacement). These cost estimates are preliminary and will be refined as the measures are implemented. Implementation and monitoring of data is proposed to be primarily the responsibility of the Public Works staff. The Community Development Coordinator may lead education and outreach measures. The City Administrator is responsible for developing the annual budget, which is ultimately approved by City Council. It is noted that implementation of proposed measures will continue to be subject to budget constraints and Council approval. Depending on budget and feasibility, it may be appropriate for the City to hire additional staff to implement the measures in this plan and improve capacity for system management and maintenance.

The proposed Capital Improvement Plan is recommended for completion early in the planning period in order to refine cost information and integrate the costs of the proposed measures into the City's budget. Installation of measurement devices and a leak detection survey should also be completed as soon as feasible. The implementation plan may be modified based on updates to the Capital Improvement Plan. It is assumed that all funding will come from the City budget (which includes the Public Works budget and water system revenues). The City may pursue grant funding or financing to help to implement these activities.

This Plan also recommends early development of the Water Measurement Plan which will provide guidance on priorities and costs for implementation of new meters and measuring devices. The Measurement Plan may also include necessary hardware and software upgrades to the City's systems to facilitate regular data reporting and analysis. Measurement and water use data can contribute to all of the City's goals for this Plan.

The System Water Audit and the Capital Improvement Plan will also help to identify the savings from avoided costs associated with efficiency activities. Compiling this information is important to build public support as well as for future budgeting (see Goal No. 2). At this time, the City does not charge by volume and, therefore, no losses to revenues are expected due to water efficiency activities.

Within the planning period, the City may make significant reductions in non-revenue waters that occur due to system losses and leaks. If system measurement data also indicate that there are significant non-revenue losses or higher than anticipated demands due to excessive use by consumers, this may be indicative of wasting water or, more likely, losses on the consumer's end. If these losses are indicated by system data, the City will consider measures in Plan updates that address individual water use efficiencies.

6.2 Monitoring Plan

The monitoring plan is integrated with the implementation plan in Appendix F. The data monitoring program focuses on the existing data recording devices in the system and those proposed for installation in the near future. As baseline measurement data becomes available from these sources, the City can assess the high priority locations to which to add additional monitoring devices. The monitoring plan calls for collecting data at least bi-annually from measuring locations and the SCADA system and inputting the information into a database that tracks system water use. The goal of this is to identify discrepancies that indicate leaks, losses or other issues. One of the education measures includes bi-annual presentations to City Council, which will assist decision makers with staying up-to-date on the implementation of this Plan and new water management issues. One of these presentations per year should include a discussion and analysis based on the system-wide measurement data.

7.0 PUBLIC REVIEW AND FORMAL APPROVAL

The process of review and approval of this Plan is summarized in this section. No new policies were proposed for implementation, and therefore, no policy adoption process was required.

7.1 Public Review Process

City staff aimed to develop a Plan that is appropriate for the City of Ouray and its citizens. The City Council conducted a preliminary review of the Plan at its April 21, 2014 meeting. The City made the draft Plan available for public review on June 2, 2014, which opened the public comment period. The draft Plan was announced at a City Council meeting and copies of it were available on the City's website and at the City's front desk. The request for Public Comments was advertised on the City's website, in the City's e-newsletter and published in the local paper. Additionally, the local paper wrote an article on the Plan describing its goals, quoting city staff and providing information on commenting. Copies of the public notices are included in Appendix J. The Community Development Coordinator accepted public comments in writing and via email.

One member of the public provided comments on the plan. These comments were addressed by clarifying certain language in this document, adding a measure to update the City's EQR survey, and emphasizing the need to assess City staff availability when implementing measures.

7.2 Local Adoption and State Approval Processes

The final version of the Plan integrated preliminary comments from City Council as well as public comments. The City Council adopted the Plan at their September 15, 2014 meeting in Resolution No. 10 Series 2014 (see Appendix K).

7.3 Periodic Review and Update

An annual update to the City Council on the monitoring data and water conservation issues is identified as an education measure for implementation. This measure will help to keep the Plan relevant and raise awareness of water efficiency issues. A review and update of the Plan is proposed for five to seven years from adoption. The update will address levels of implementation and changes to the City's water demands as well as other new issues.

The Plan review should include an evaluation of the baseline data collected from the system-wide measurement locations and the system-wide audit. This information may help to refine previous estimates for activities and identify new water efficiency activities.

The adoption and implementation of the Plan is an important step in raising public awareness and establishing water resource management as part of City policy. This foundation will help to implement updates to the Plan, potentially including additional measures and monitoring as the City grows and water efficiency technologies advance.

8.0 CONCLUSION

The City of Ouray has completed and adopted this voluntary Water Efficiency Plan in order to meet its goals of improved data and understanding of system operations, reduction of losses, improved ability to estimate costs savings associated with water efficiencies, and promotion of public awareness of water conservation. The Plan focuses on proposed measures that are appropriate for the size of the City and within its budget and staff resources. The Plan will be updated periodically in order to revise measures based on funding, new data and the City's future needs.

9.0 REFERENCES

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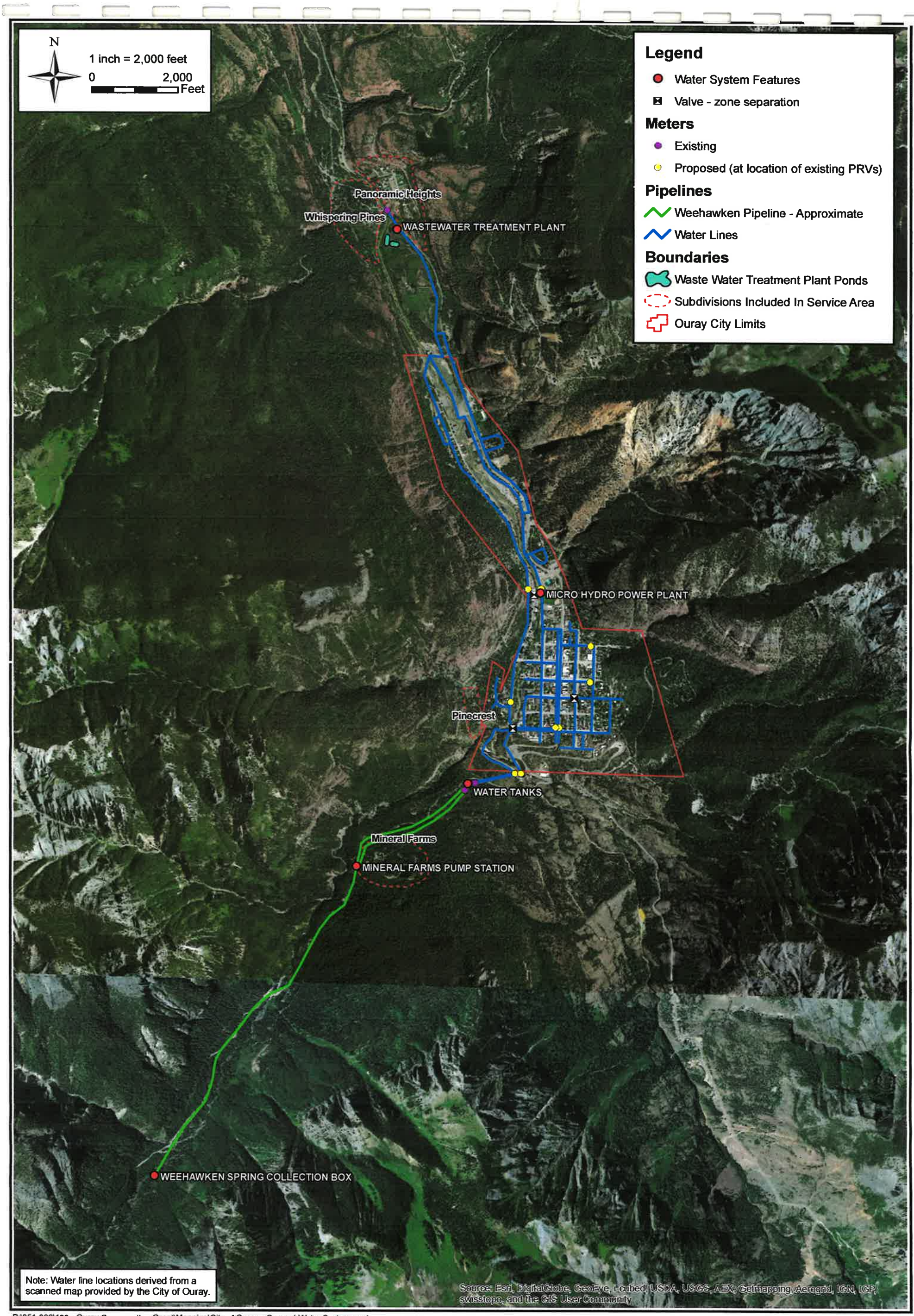
Map

Tables



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WRIGHT WATER ENGINEERS, INC.
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City of Ouray

Water System Overview

Project No.
051-036.100

MAP 1

Table 1
Water Rights Inventory - Potable Water
City of Ouray Water Efficiency Plan

Water Right Name	Adjudication Date	Appropriation Date	Administration Number*	Case Number	Use	Decreed Diversion Rate (CFS)	Decreed Storage Volume (AF)	Comments
Oak Creek Supply Line	12/6/1904	10/1/1881	11597.00000	CA1254	Fire, Domestic, Storage	5.2	–	
Oak Creek Reservoir	12/6/1904	10/1/1881	11597.00000	CA1254	Fire, Domestic, Storage	–	0.79	
Oak Creek Alt Point Weehawken Spring and Creek	12/6/1904	10/1/1881	11597.00000	W-1208	Fire, Domestic, Storage	–	–	Alternate Point of Diversion for 5.2 cfs; limited to the flow available at the Oak Creek point of diversion
Weehawken Creek	12/6/1904	4/15/1895	14427.00000	CA1254	Fire, Domestic, Storage	3.816	–	
New Reservoir	12/6/1904	7/1/1889	14427.00000	CA1254	Fire, Domestic, Storage	–	2.25	
Weehawken Spring	12/6/1904	7/1/1889	16541.00000	CA1254	Fire, Domestic, Storage	3.816	–	
Total	–	–	–	–	–	**12.832**	**3.04**	–

Notes:
*The administration numbers are estimated based on the appropriation dates of the water rights and the State Engineer's Order No. 2014-1. These will be confirmed by the Division Engineer.
The City of Ouray owns 100% of these water rights.
All water rights are Absolute.

Table 2
Total EQRs by Customer Category
City of Ouray Water Efficiency Plan

Category	Percentage of Total Water Demand Based on 2005 Survey
Single Family Homes	40%
Multi-Family Homes	31%
Irrigation	14%
Lodging	5%
City Offices	4%
Churches	3%
Restaurants	2%
Retail and Office Space	2%

Notes:

Based on 2005 EQR Survey.

Table 3
City of Ouray Historical Population
City of Ouray Water Efficiency Plan

Year	(1) Population	(2) Annual Percent Increase or Decrease
1990	644	–
1991	659	2.3%
1992	684	3.8%
1993	694	1.5%
1994	742	6.9%
1995	779	5.0%
1996	806	3.5%
1997	780	-3.2%
1998	782	0.3%
1999	799	2.2%
2000	820	2.6%
2001	832	1.5%
2002	849	2.0%
2003	860	1.3%
2004	883	2.7%
2005	890	0.8%
2006	898	0.9%
2007	939	4.6%
2008	972	3.5%
2009	978	0.6%
2010	1,001	2.4%
Average		**2.3%**

Notes:
1) Based on data from the Colorado Department of Local Affairs. DOLA website www.dola.colorado.gov accessed on November 6, 2013.

2) (Current year's population / previous year's population) - 1, as a percentage.

Table 4
Long-Term Water Demand Estimate
City of Ouray Water Efficiency Plan

Month	Demands	
	Acre-Feet	cfs
January	145	2.4
February	132	2.4
March	145	2.4
April	142	2.4
May	163	2.9
June	167	3.4
July	172	3.4
August	166	3.2
September	155	3.0
October	151	2.5
November	141	2.4
December	145	2.4
Annual	**1,825**	
Max cfs		**3.4**

Notes:

Demands are based on estimated full build-out of 4,365 EQRs using 350 gpd/EQR, calculated by applying historical growth rate of 2.3% to 2011 EQR count for a 50 year projection. Additional estimated demands for irrigation were also included in the demands.

Table 4
Long-Term Water Demand Estimate
City of Ouray Water Efficiency Plan

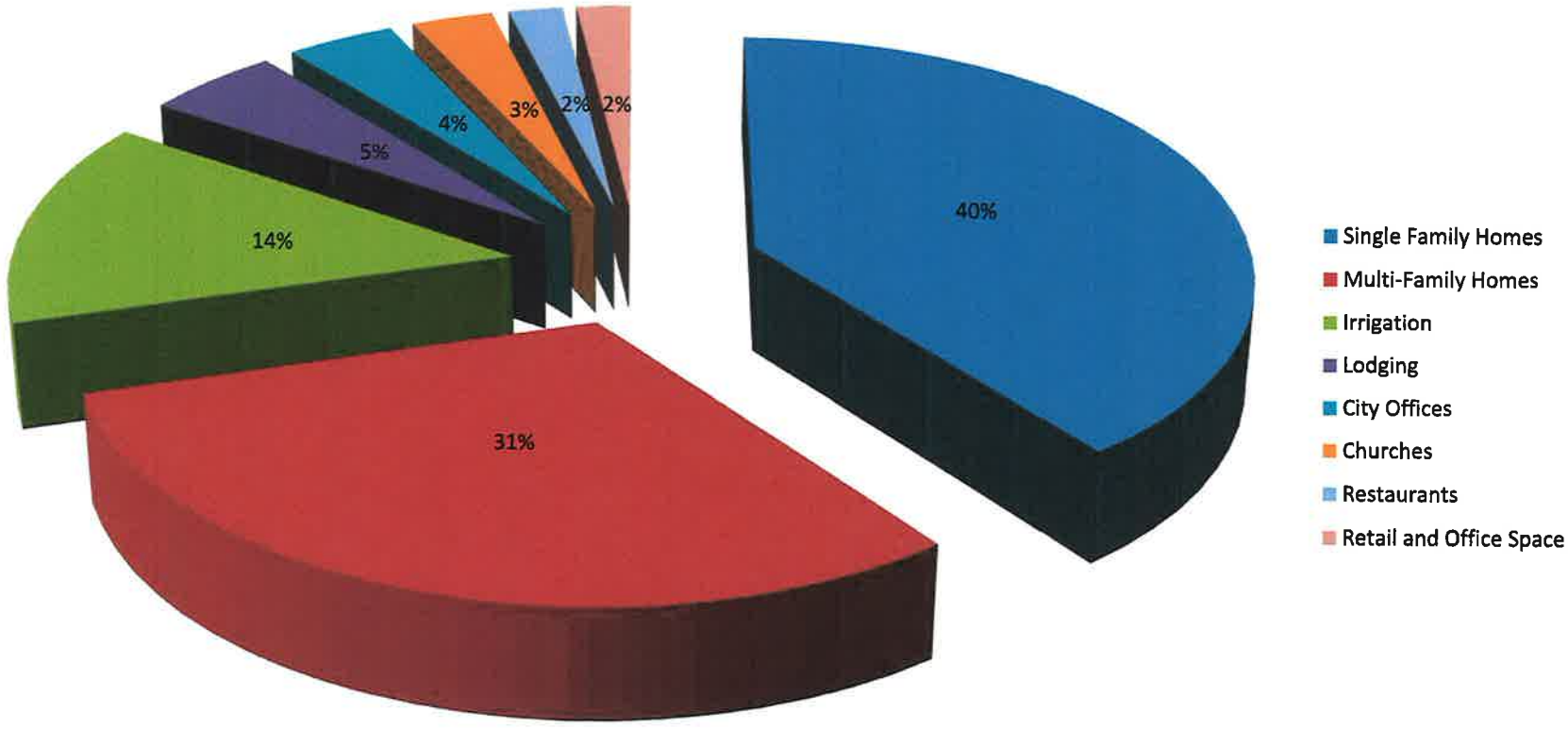
Month	Demands	
	Acre-Feet	cfs
January	145	2.4
February	132	2.4
March	145	2.4
April	142	2.4
May	163	2.9
June	167	3.4
July	172	3.4
August	166	3.2
September	155	3.0
October	151	2.5
November	141	2.4
December	145	2.4
Annual	**1,825**	
Max cfs		**3.4**

Notes:

Demands are based on estimated full build-out of 4,365 EQRs using 350 gpd/EQR, calculated by applying historical growth rate of 2.3% to 2011 EQR count for a 50 year projection. Additional estimated demands for irrigation were also included in the demands.

Figure

Figure 1
City of Ouray Water Efficiency Plan
Total EQRs by Customer Category



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All Tables for Report

Wright Water Engineers, Inc.
8/6/2014

Des By: BMN
Ckd By:

Appendices

Appendix A

Identification and Screening of Foundational Activities

Appendix A
City of Ouray Water Efficiency Plan
Identification and Screening of Foundational Activities

Water Efficiency Activities for Screening	State Statute Requirement	Identification		Qualitative Screening					Carry to Evaluation	Reason for Elimination
		Existing/ Potential Activity	Targeted Customer Category	Provides or Improves Water Use Data Collection and Monitoring	Provides Operational Cost Information	Helps to Decrease System Losses	Public Acceptance or Public Education	Additional Pro/Cons (i.e. financial feasible, measurable, appropriate for City's current system)		
Water Use Efficiency Oriented Rates and Tap Fees										
Volumetric Billing	VII, VII	Potential	System-Wide	X	X				Not at This Time	Not feasible until all accounts are metered
Water Rate Adjustments		Existing	System-Wide		X				Yes	Is currently done on an annual basis during the City's budget process
Frequency of Billing		Potential	System-Wide	X	X				Not at This Time	Is currently done on an annual basis during the City's budget process
Inclining/Tiered Rates		Potential	System-Wide		X				Not at This Time	Is currently done on an annual basis during the City's budget process
Water Budgets		Potential	System-Wide		X				Not at This Time	Is currently done on an annual basis during the City's budget process
Tap Fees with Water Use Efficiency Incentives		Potential	System-Wide		X				Not at This Time	Not feasible until all accounts are metered
System Water Loss Management and Control										
System Water Audit	N/A	Potential	System-Wide	X	X	X		In coordination with installing new meters, will improve overall data. May reduce amount of leak detection required or increase amount of billing for water	Yes	
Control of Apparent Losses (with Measuring on system infrastructure)		Potential	System-Wide	X	X	X	X	To include a comprehensive plan for water system and water supply measurements and integration into SCADA to facilitate reporting and observations	Yes	
Leak Detection and Repair		Potential	System-Wide	X	X	X		Reducing leaks will more accurately determine how much water is being used and appropriate billing; cost and ongoing requirement for detection may limit feasibility; updating City's GIS resources for water supply system is integral to managing data and analysis and tracking work completed.	Yes	
Water Line Replacement Program		Existing	System-Wide			X		A review of the budget process for line replacement may result in changes to the annual allocation to better match system needs.	Yes	
Planning										
Integrated Water Resources Plans	N/A	Potential	System-Wide		X			City is already working on water resources planning in other areas	Not at This Time	The City's water rights and water supply work are ongoing and an additional resource plan is not needed at this time.
Master Plans/Water Supply Plans		Potential	System-Wide	X			X	Master Plan components are included in the CIP and the City's water rights activities	Not at This Time	Master Plan concepts to be included in updated CIP
Capital Improvement Plans		Existing	System-Wide	X	X	X		Existing Master Plan/CIP should be updated to reflect work completed since plan was issued in 2003 and to include major projects	Yes	
Feasibility Studies		Potential	System-Wide	X	X			Cost not effective at this time due to lack of overall data	Not at This Time	More valuable once more meter data is available
Staff										
Water Conservation Coordinator	N/A	Potential	System-Wide	X			X	Not enough infrastructure or data to implement level of conservation requiring coordinator at this time	Not at This Time	More valuable once additional measures are in place

Note: measures for further evaluation highlighted in blue.

Appendix B

Identification and Screening of Targeted Technical Assistance Activities

Appendix B
City of Ouray Water Efficiency Plan
Identification and Screening of Targeted Technical Assistance Incentives

Water Efficiency Activities for Screening	State Statute Requirement	Identification					Qualitative Screening					Carry to Evaluation	Reason for Elimination
		Existing or Potential Activity	SWSI Framework Levels: Level 1 Municipal Uses	Level 2 Customers with the Largest Water Use	Level 3 Customer Type(s) in Service Area	Targeted Customer Category	Provides or Improves Water Use Data Collection and Monitoring	Provides Operational Cost Information	Helps to Decrease System Losses	Public Acceptance or Public Education	Additional Pro/Cons (i.e. financial feasible, measurable, appropriate for City's current system)		
Installation of Water Efficient Fixtures and Appliances													
Indoor Audits	I	Potential	X	X	X		X	X	X	X		Not at This Time	Lack of incentives at this time due to lack of metering
Toilet Retrofits		Potential	X	X	X					X		Not at This Time	Lack of incentives at this time due to lack of metering
Urinal Retrofits		Potential	X	X	X					X		Not at This Time	Lack of incentives at this time due to lack of metering
Showerhead Retrofits		Potential		X	X					X		Not at This Time	Lack of incentives at this time due to lack of metering
Faucet Retrofits (e.g. aerator installation)		Potential	X	X	X					X		Not at This Time	Lack of incentives at this time due to lack of metering
Water Efficient Washing Machines		Potential		X	X					X		Not at This Time	Lack of incentives at this time due to lack of metering
Water Efficient Dishwashers		Potential		X	X					X		Not at This Time	Lack of incentives at this time due to lack of metering
Efficient Swamp Cooler and Air Conditioning Use		Potential	X	X	X					X		Not at This Time	Lack of incentives at this time due to lack of metering
Low Water Use Landscapes													
Drought Resistant Vegetation	II	Potential	X	X	X					X		Not at This Time	Lack of incentives at this time due to lack of metering
Removal of Phreatophytes		Potential										No	Phreatophytes are not extensive and existing wetlands are beneficially environmentally
Irrigation Efficiency Evaluations/Outdoor Water Audits		Potential	X	X			X	X	X	X		Not at This Time	Lack of incentives at this time due to lack of metering
Outdoor Irrigation Controllers		Potential	X	X			X					Not at This Time	Lack of incentives at this time due to lack of metering
Irrigation Scheduling/Timing		Potential	X	X								Not at This Time	Lack of incentives at this time due to lack of metering
Rain Sensors		Potential	X	X			X					Not at This Time	Lack of incentives at this time due to lack of metering
Residential Outdoor Meter Installations		Potential			X							Not at This Time	Meter program not advanced at this time
Xeriscaping		Potential	X	X	X					X		Not at This Time	Lack of incentives at this time due to lack of metering
Other Low Water Use Landscapes		Potential	X	X	X					X		Not at This Time	Lack of incentives at this time due to lack of metering
Irrigation Equipment Retrofits		Potential	X	X			X		X			Not at This Time	Lack of incentives at this time due to lack of metering
Water Efficient Industrial and Commercial Water-Using Processes													
Specialized Nonresidential Surveys, Audits, and Equipment Efficiency Improvements	III	Potential	X	X			X	X	X			Not at This Time	Lack of incentives at this time due to lack of metering. Additional education and outreach before targeting individual users.
Commercial Indoor Fixture and Appliance Rebates/Retrofits		Potential		X						X		Not at This Time	Lack of incentives at this time due to lack of metering
Cooling Equipment Efficiency		Potential		X								No	Unlikely to be significant water savings given cold climate
Restaurant Equipment		Potential		X								Not at This Time	Lack of incentives at this time due to lack of metering
Incentives													
Toilet Rebates	X	Potential		X	X				X		Minor decrease in system losses compared to larger infrastructure loss detection; better addressed through education/awareness and state or federal rebates	Not at This Time	Cost of rebates not City's priority for water conservation funds
Urinal Rebates		Potential		X	X				X			Not at This Time	Cost of rebates not City's priority for water conservation funds
Showerhead Rebates		Potential		X	X				X			Not at This Time	Cost of rebates not City's priority for water conservation funds
Water Efficient Faucet or Aerator Rebates		Potential		X	X				X			Not at This Time	Cost of rebates not City's priority for water conservation funds
Water Efficient Washing Machine Rebates		Potential		X	X				X			Not at This Time	Cost of rebates not City's priority for water conservation funds
Water Efficient Dishwasher Rebates		Potential		X	X				X			Not at This Time	Cost of rebates not City's priority for water conservation funds
Efficient Irrigation Equipment Rebates		Potential		X	X				X			Not at This Time	Cost of rebates not City's priority for water conservation funds
Landscape Water Budgets Information and Customer Feedback		Potential		X	X				X	X	Relatively low cost if audits focused on largest irrigated areas; improvements can be educational opportunity, help compare calculated water demands with usage data	Not at This Time	Engage water users in workshop activities (see Appendix D)
Turf Replacement Programs/Xeriscaping Incentives		Potential		X	X					X	Limited amount of grass in City. Building code for new development has some landscape requirements	Not at This Time	Cost greater than benefits
Give-Aways		Potential		X	X				X		Requires sourcing and City to fund	Not at This Time	Cost of give-aways not City's priority for water conservation funds

Appendix C

Identification and Screening of Ordinances and Regulations Activities

Appendix C
City of Ouray Water Efficiency Plan
Identification and Screening of Ordinances and Regulations

Water Efficiency Activities for Screening	State Statute Requirement	Identification					Qualitative Screening					Carry to Evaluation	Reason for Elimination
		Existing or Potential Activity	SWSI Framework Levels: Level 1 Customer Type(s) within the Existing Service Area	SWSI Framework Levels: Level 2 New Development	SWSI Framework Levels: Level 3 Point of Sales on Existing Building Stock	Targeted Customer Category	Provides or Improves Water Use Data Collection and Monitoring	Provides Operational Cost Information	Helps to Decrease System Losses	Public Acceptance or Public Education	Additional Pro/Cons (i.e. financial feasible, measurable, appropriate for City's current system)		
General Water Use Regulations													
Waste Water Ordinance	IX	Existing	X	X	X			X		X		Not at This Time	Existing code adequate at this time (see Section 9-11)
Time of Day Watering Restriction		Existing	X							X		Not at This Time	Existing code adequate at this time (see Section 9-11)
Day of Week Watering Restriction		Existing	X							X		Not at This Time	Existing code adequate at this time (see Section 9-11)
Water Overspray Limitations		Potential									Partially covered under existing code	Not at This Time	Existing code adequate at this time (see Section 9-11)
Landscape Design/Installation Rules and Regulations													
Rules and Regulations for Landscape Design/Installation	IX	Potential	X	X						X	May reduce demands without requiring meters to be installed	Not at This Time	Current building code encourages xeriscaping and drip irrigation (see Section 7.4.D.h).
Landscaper Training and Certification		Potential		X								Not at This Time	Limited amount of outdoor irrigated area exists in City; not high priority
Soil Amendment Requirements		Potential		X								Not at This Time	Limited amount of outdoor irrigated area exists in City; not high priority
Turf Restrictions		Potential	X	X								Not at This Time	Limited amount of outdoor irrigated area exists in City; not high priority
Irrigation Equipment Requirements		Potential	X	X								Not at This Time	Limited amount of outdoor irrigated area exists in City; not high priority
Outdoor Water Audits/Irrigation Efficiency Regulations		Potential	X	X	X		X	X	X	X	Limited availability of city to work with audits therefore not appropriate to mandate at this time	Not at This Time	Limited amount of outdoor irrigated area exists in City; not high priority
Outdoor Green Building Construction		Potential	X	X								Not at This Time	Limited amount of outdoor irrigated area exists in City; not high priority
Indoor and Commercial Regulations													
High Efficiency Fixture and Appliance Replacement	IX	Potential	X	X							High cost to local businesses	Not at This Time	Cost to businesses not supported by data on benefits due to lack of audits/meters
Commercial Cooling and Process Water Requirements		Potential	X	X							High cost to local businesses, not enough data on benefits	Not at This Time	Limited amount of cooling due to climate, lack of data at this time
Green Building Construction		Potential	X	X								Not at This Time	Inadequate data to analyze costs/benefits and support a requirement
Indoor Plumbing Requirements		Potential	X	X					X			Not at This Time	Inadequate data to analyze costs/benefits and support a requirement
City Facility Requirements		Potential	X						X	X	City may incorporate on a voluntary basis when undertaking new projects	Not at This Time	Inadequate data to analyze costs/benefits and support a requirement. May be done voluntarily
Required Indoor Residential Audits		Potential	X	X				X	X		See Appendix B	Not at This Time	Inadequate data to analyze costs/benefits and support a requirement. May be done voluntarily
Required Indoor Commercial Audits		Potential	X	X				X	X		See Appendix B	Not at This Time	Inadequate data to analyze costs/benefits and support a requirement. May be done voluntarily
Commercial Water Wise Use Regulations (Car Washes, Restaurants, etc.)		Potential	X	X						X		Not at This Time	Cost to businesses not supported by data on benefits due to lack of audits/meters

Appendix D

Identification and Screening of Education Activities

Appendix D
City of Ouray Water Efficiency Plan
Identification and Screening of Education Activities

Water Efficiency Activities for Screening	Identification					Qualitative Screening					Carry to Evaluation	Reason for Elimination
	Existing/Potential Activity	SWSI Framework Levels: Level 1 One-Way	Level 2 One-Way with Feedback	Level 3 Two-Way Communication	Targeted Customer Category	Provides or Improves Water Use Data Collection and Monitoring	Provides Operational Cost Information	Helps to Decrease System Losses	Public Acceptance or Public Education	Additional Pro/Cons (i.e. financial feasible, measurable, appropriate for City's current system)		
Customer Education												
Bill Stuffers	Existing	X							X	Cost of developing, printing, inserting in bills	Yes	
Newsletter	Potential	X							X	Cost of developing, printing	Not at This Time	Can be accomplished through other less costly measures
Newspaper Articles	Potential	X							X	Low cost; misinformation or misunderstandings possible	Yes	
Mass Mailings	Potential	X							X	Cost of developing, printing	Not at This Time	Can be accomplished through other less costly measures
Web Pages	Existing	X							X	Combine with Existing City website	Yes	
Water Fairs	Potential		X						X		Not at This Time	Given the limited population and limited resources of City staff, water fairs are not practical for the City at this time
K-12 Teacher and Classroom Education Programs	Potential		X						X		Not at This Time	Given the limited resources of City staff and schools, classroom activities are not practical for the City at this time
Message Development/Campaign	Potential		X						X		Not at This Time	To be considered when more user-based conservation measures are appropriate
Interactive Websites	Potential		X						X		Not at This Time	Existing website and contact information sufficient at this time
Social Networking	Potential			X					X		Not at This Time	Existing efforts in small community sufficient at this time
Customer Surveys	Potential		X						X		Not at This Time	To be considered after initial phases of system meters and leak detection have refined customer-sided issues.
Focus Groups	Potential			X					X		Not at This Time	To be considered when more user-sided implementation measures are proposed
Citizen Advisory Boards	Potential			X			X		X		Not at This Time	Existing volunteer boards may overlap some of these functions and already place a large demand on volunteers
Technical Assistance												
Customer Water Use and Landscape Design and Maintenance Workshops	Potential			X					X	Grant or assistance may be available from regional water entities; coordinate outreach with other city-wide services. Landscape workshops may include partnering with other organizations or businesses.	Yes	Customer water use and landscape workshops were combined to improve attendance and reduce staff time requirements.
Xeriscaping Demonstration Garden	Potential	X							X	City does not have adequate resources or locations at this time	Not at This Time	
Water Conservation Expert Available	Potential			X				X	X	Cost prohibitive for City to solely provide expert	Not at This Time	Refer people to experts associated with other regional water entities

Note: measures for further evaluation highlighted in blue.

Appendix E1

Evaluation and Selection of Proposed Water Efficiency Activities

Appendix E1
City of Ouray Water Efficiency Plan
Evaluation and Selection of Proposed Efficiency Activities

Water Efficiency Activities for Evaluation	Existing/ Potential Activity	Targeted Customer Category	Review of Qualitative Screening: Qualitative Goals: Provides or Improves Water Use Data Collection and Monitoring	Qualitative Goals: Provides Operational Cost Information	Qualitative Goals: Helps to Decrease System Losses	Qualitative Goals: Promotes Public Acceptance or Public Education	Projected Water Savings: Total Water Savings (gallons)	Projected Water Savings: Average Annual Water Savings (gallons)	Projected Implementation Costs	Evaluation: Quantitative Goals: Improved ability to track water use through main system infrastructure	Quantitative Goals: Provides data on quantity of water processed by system	Quantitative Goals: Reduction in system losses as meter data becomes available	Quantitative Goals: Public approval of funding allocations to activity	Notes on Additional Pros/Cons to Consider	Final Selection: Selected for Implementation	Final Selection: If Eliminated, Reason Why Eliminated
Foundational Activities																
Water Rate Adjustments	Existing	System-Wide		X			0	0	$ 5,250					Is currently done on an annual basis during the City's budget process Recommend implemnting an annual update to the EQR use type categories and analysis	Yes	
System Wide Water Audits	Potential	System-Wide	X	X	X		29,587,271	2,958,727	$ 31,500	X	X	X	X	In coordination with installing new meters and data tracking, will improve overall data. May reduce amount of leak detection required or increase amount of billing for water	Yes	
Control of Apparent Losses (Develop Water Measurement Plan)	Potential	System-Wide	X	X	X				$ 45,000	X	X	X	X	Measuring plan will assist in compliance with Water Rights decrees and other agreements the City has entered into with other entities Cost estimates will change over time as planning progresses	Yes	
Control of Apparent Losses (Implementation of Water Measurement Plan)	Potential	System-Wide	X	X	X				$ 150,000	X	X	X	X	Implementation of measuring plan will be based on priority and funds available for each location and will take place over the planning period. Cost estimate subject to change based on development of Water Measurement Plan.	Yes	
Leak Detection Study	Potential	System-Wide	X	X	X		7,396,818	-	$ 18,500		X	X	X	Reducing leaks will more accurately determine how much water is being used and appropriate billing; cost and ongoing requirement for detection may limit feasibility; updating City's GIS resources for water supply system is integral to managing data and analysis and tracking work completed.	Yes	
Water Line Replacement Program	Existing	System-Wide			X		133,142,719	2,958,727	$ 2,416,000			X	X	A review of the budget process for line replacement may result in changes to the allocation. This will be done in combination with the CIP (see below)	Yes	
Capital Improvement Plans	Existing	System-Wide	X	X	X		14,793,635	1,479,364	$ 18,750	X	X	X	X	Existing Master Plan/CIP should be updated to reflect work completed since plan was issued in 2003 and to include major projects	Yes	
Targeted Technical Assistance																
None at this time	Potential	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ordinances and Regulations																
None at this time	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Public Education and Outreach																
Bill Stuffers	Existing	Residential & Commercial				X	5,748,750	127,750	$ 6,500				X	Cost of developing, printing, inserting in bills	Yes	
Newspaper Articles	Potential	Residential & Commercial				X	5,748,750	127,750	$ 5,600				X	Low cost; misinformation or misunderstandings possible	Yes	
Web Pages and Social Media	Existing	Residential & Commercial				X	5,748,750	127,750	$ 9,800				X	Combine with Existing City website	Yes	
City Demonstration Activities and Public Presentations	Potential	All			X	X	29,587	2,959	$ 7,100				X	Instead of offering incentive programs or rebates, the City will implement various measures such as rain-sensor controlled irrigation, low-flow fixtures, and climate appropriate landscaping to conserve water and provide educational examples. City staff will also make presentations during public council meetings bi-annually on water conservation issues relevant to the City.	Yes	
Customer Water Use Workshops and Landscape Design and Maintenance Workshops	Potential	Residential				X	6,093,675	112,846	$ 3,667				X	Grant or assistance may be available from regional water entities; coordinate outreach with other city-wide services. Landscape workshops may include partnering with other organizations or businesses.	Yes	

Notes:
Only measures selected for further evaluation are included here (see appendices A-D)
See Appendix E2 for detailed cost and water savings assumptions. Costs subject to change during refinement of measure and implementation.

Appendix E2

Cost and Water Savings Calculations for Proposed Water Efficiency Activities

Appendix E2
City of Ouray Water Efficiency Plan
Cost and Water Savings Calculations for Proposed Efficiency Activities
DRAFT

Water Efficiency Activities for Evaluation	Total Cost						Total Water Savings*			Cost per Thousand Gallons Saved ($)	Notes on Measure
	Planning Period (No. of Years)	Quantity (#)	One Time Labor/ Material ($)	Average Annual Staff Labor ($ = # hrs x $35/hr)	Annual Materials ($)	Total Cost In Planning Period ($)	Gallons saved per unit	Annual Gallons Saved	Total Gallons Saved		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Foundational Activities											
Water Rate Adjustments	10	10	$ -	$ 525	$ -	$ 5,250	0	0	0	N/A	Assumes 10 hours of staff time to prepare and discuss the budget item for a rate increase and obtain Council approval. Because water is charged at a flat rate, increased cost do not correlate to water conservation by individuals. Increased revenue for the utilities department helps enable necessary operations, maintenance and repairs and thus indirectly assist in conservation. Assumes 5 hours to update the EQR survey use categories and add non-revenue categories for future tracking.
Control of Apparent Losses (Develop Water Measurement Plan)	1	1	$ 40,000	$ 5,000	$ -	$ 45,000	2,958,727	2,958,727	29,587,271	$ 7.66	Measuring plan will address water not billed in current water supply system (i.e. augmentation source, hot springs water supply) so all savings are not shown in estimate. Labor and Materials include consulting assistance, contract work for specifying equipment, and purchase of software and hardware necessary for upgrading SCADA capabilities. Staff time estimated for assistance and coordination with development and SCADA implementation.
Control of Apparent Losses (Implementation of Water Measurement Plan)	10	1	$ 150,000			$ 150,000					Costs should include staff time for OM&R of measuring devices (audit is the monitoring and analysis, may need to revise audit cost/frequency). Rough esitmate of $150,000 for implementation of measuring devices, data loggers, and SCADA connections throughout the water supply system and City's water sources. Costs will be refined during the development of the plan (see measure above).
System Water Audit	10	10	$ -	$ 3,150	$ -	$ 31,500					Assumes 90 hrs/yr of staff time to collect data, compile and analyze water use system wide. Assumed savings of 1% per year due to identifying leaks/losses and improved management. Assumes is implemented in year 1 of the 10 year planning period. Cost savings to reducing volume of water processed by system are not included in this cost analysis.
Leak Detection Study	10	1	$ 4,500	$ 1,400	$ -	$ 18,500	7,396,818	-	7,396,818	$ 2.50	Assumes cost of $4,500 for 11 miles of ductile iron pipe (see quote from UTS, Inc., Appendix J) for total distribution system, excluding the Wehawken spring transmission line, completed once during the plan period and assumes staff time of 40 hours to assist in survey. Savings are 2.5% per year. Cost savings to improved system operations and reduced emergencies are not included. Assumes study is completed in year 1 of the 10 year planning period.
Water Line Replacement Program	10	10		$ 2,100	$ 239,500	$ 2,416,000	2,958,727	2,958,727	133,142,719	$ 18.15	Assumes replacement of 2,500 ft of line using DIP each year by contractor. Estimate material cost of $28/ft of DIP, plus $65/ft for installation, plus $7,000 to connect to existing lines (labor and material), plus 60 hours/year of staff time to coordinate and inspect the work. Assumes burying pipe to 5 ft depth (not anticipated to have significant rock work). Results in 1% savings, cumulative each year.
Capital Improvement Plan	10	1	$ 10,000	$ 875	$ -	$ 18,750	1,479,364	1,479,364	14,793,635	$ 1.27	Assumes a one-time consultant cost of $10,000 to update the current Master Plan/CIP and 25 hours per year of City staff time to integrate the CIP into the annual utilities budget and have approved by council. Water savings from improved condition of infrastructure is estimated to be 0.5% per year in addition to savings from pipe replacement program (see above). Assumes update to CIP is completed in year 1 of 10 year planning period.
Public Education and Outreach											
Bill Stuffers	10	10	$ -	$ 350	$ 300	$ 6,500	127,750	127,750	5,748,750	$ 0.0011	Assumes 5 hours per year to prepare flyer with information, 5 hours per year to prepare mailing, and annual cost of $300 per year to print for 1,000 accounts. Assumes savings of 0.1% from voluntary conservation resulting from education and conservation is cumulative over the planning period.
Newspaper Articles	10	40	$ -	$ 560	$ -	$ 5,600	127,750	127,750	5,748,750	$ 0.0010	Assumes 4 articles per year, 4 hrs of staff time per article. Assumes savings of 0.1% from voluntary conservation resulting from article education over 1,000 account holders.
Web Pages and/or social media	10	40	$ -	$ 980	$ -	$ 9,800	127,750	127,750	5,748,750	$ 0.0017	Assumes 6 hrs of staff time per quarter to provide updated water conservation content to web manager, and put conservation content on Facebook and/or other social media, plus 1 hr per quarter of web managers time. Assumes savings of 0.1% from voluntary conservation over 1,000 account holders and program begins in year 1 of 10 year planning period.
City Demonstration Activities and Public Presentations	10	-	-	$ 210	$ 500	$ 7,100	2,959	2,959	29,587	$ 4.17	Instead of offering incentive programs or rebates, the City will implement various measures such as rain-sensor controlled irrigation, low-flow fixtures, and climate appropriate landscaping to conserve water and provide educational examples. It is assumed that $500 per year is budgeted in staff time or materials purchase to implement conservation measures. Additionally, City staff will make public presentations on water conservation issues relevant to the City during City Council meetings an estimated 2 times per year, requiring 3 hours of staff time per presentation. The resulting saving to the City and through education is assumed to be 0.01%.
Customer Water Use and Landscape Design and Maintenance Workshops	10	3	-	$ 233	$ 133	$ 3,667	338,538	112,846	6,093,675	$ 0.0006	Assumes 1 workshop every 3 years, requiring $400 in supplies/give-aways, and 20 hrs of staff time per event (plus volunteer from local garden community/business). Costs may be reduced by teaming with local watershed partners group or seeking grant funding. Assumes 10 households per event each with a 15% savings on outdoor irrigation of 0.08 acres (average City lawn size) from implementing outdoor water conservation methods and 2% savings on indoor water demands for each household and program begins in year 1 of 10 year planning period..
					Total Cost	**$ 2,717,667**	**Total Water Saved:**		**208,289,955**		

Notes:
(1) Only measures selected for further evaluation are included here (see appendices A-D).
(2) Planning period for implementation of measure. Because of lack of metering, existing conservation efforts have not been quantified and will only be addressed in the future planning period.
(3) Total number of units to be implemented over the planning period for each measure.
(4) Capital costs to implement the program such as purchase of equipment. Labor required to manage the program, install equipment or otherwise carry out the measure is also included. Costs subject to change upon further study and implementation
(5) Annual City staff labor costs for maintaining the equipment or program. Costs subject to change upon further study and implementation
(6) Annual material costs for maintaining the equipment or program. If installation of equipment is annually completed by contractor, the contractor costs are included in this column. Costs subject to change upon further study and implementation
(7) Equals (Column 2 x (Column 5 + Column 6) + (Column 3 x (Column 4 + Column 5)).
(8) May be based on savings per unit x no. of units or may be a percentage of water savings over the entire system (see notes in Column 12).
(9) Equals water saved on an annual basis by the measure.
(10) Equals Column 8 X Column 9 x Column 2.
(11) Equals Column 7 / Column 10. Costs subject to change upon further study and implementation
(12) Notes on implementation of the measures. Notes on the basis of assumptions for the calculations used in this sheet.
* Total gallons as baseline is 908 AF in 2010 (see Table 3) = 295,872,708 gallons. Savings from Public Education and Outreach are based on a household demand of 350 gallons per day (= 75 gpdpc x 3.5 persons/home + 87 gpd averaged outdoor use). Savings associated with existing conservation measures is not shown due to lack of historical meter data to determine savings. All calculations are based on a current baseline and projected forward.

Appendix F

Proposed Implementation and Monitoring Plan

Appendix F
City of Ouray Water Efficiency Plan
Proposed Implementation and Monitoring Plan

Selected Water Efficiency Activities	Period of Implementation	Implementation Actions	Milestone Deadlines	Total Budget	Entity/Staff Responsible for Implementation	Entity/Staff Responsible for Data Collection	Schedule of Data Collection	Coordination and Public Involvement	Additional Comments
Water Rate Adjustments	10 years	Annual Budget Item	Annual City Budget Approval	2 percent increase on existing rates and $3,500 of staff effort	City Administrator			Public comment during Council adoption of budget	City policy is to propose a 2% rate increase every year. This percent increase may be adjusted annually based on that years budget considerations.
Control of Apparent Losses (Develop Water Measurement Plan)	1 year	Develop water measurement plan; Identify meters to be purchased and have budget approval	1 year	$45,000	City Administrator Public Works Director Consultant/Supplier	Public Works Director Assistance as needed from consultants	Review Measurement Plan as it is being implemented.	Public Comment during budget process	Resources will be put into developing a comprehensive measurement plan that captures all of the locations that require measurement and integrating them into the City's SCADA system to facilitate regular reporting and review of water use. Controlling losses will reduce system operational costs by reducing the amount of water treated and delivered into the system. The amount of losses and costs of operations may be compared to estimate savings once baseline loss data is available.
		Create meter monitoring and database program	1 year		Public Works Director	Public Works Ditector	Biannually	public input during presentations and budget process	
Control of Apparent Losses (Implementation of Water Measurement Plan)	10 years	Installation of measurement devices per Measurement Plan and evolving water management needs	Annually	$150,000	City Administrator Public Works Director Consultant				City will have on ongoing process to seek funding and staff availability to implement measurement device improvements and installations based on the Measurement Plan. The measuring devices will help improve system management and overall water resources management.
System Wide Water Audits	8 years (beginning once meters are in place)	bi-annual data entry and review	bi-annual once meters in place	$31,500	Public Works Director	Public Works Director	January and June		Monitoring will begin once meters are installed. At installation, the City's database for meter records will be revised to incorporate new data and analyze results to help to identify un-metered water and losses which will reduce operational costs without reducing revenues.
		annual reporting of data and analysis as a City Council presentation	annual once meters are in place		Public Works Director	Public Works Director	Meeting before budget process	public input during presentations and budget process	
Leak Detection Study	2 years	Obtain funding and contract approval from City	1 year	$18,500	City Administrator Public Works Director				Results of study will be used to identify losses in the meter data and to direct replacement and repair program. The results of the study can be used to estimate losses to the system and the reduction in the amount of water needed in the system.
		Conduct leak detection study	2 years		Public Works Director Contractor	Public Works Director	Once during leak detection study		
Water Line Replacement Program	10 years	annual budget item and contract approval	Annual City Budget Approval	$2,416,000	City Administrator Public Works Director			Public Comment during budget process	Line replacement will coincide with system metering and savings from reduced losses may be identified in the meter data.
		City staff and contractor complete line replacements	Annually		Public Works Director Contractor				
Capital Improvement Plans	2 years (CIP affects funding plan for all other measures)	Obtain funding and contract approval from City	1 year	$18,750	City Administrator Public Works Director			Public Comment during budget process	CIP update may identify thresholds water volume that would require new infrastructure (such as storage or treatment facilities). The costs from the CIP can be used to estimate savings from reducing system losses and overall demands through conservation.
		City staff and consultant complete CIP updates	2 years		Public Works Director Consultant				
		City staff integrate into annual budget process each year	Annually after 2 years		City Administrator Public Works Director			Public Comment during budget process	
Bill Stuffers	10 years	city staff prepare flyers and include in billing notices	Annually	$6,500	Community Development Coordinator			Public will receive flyers	Flyers to include City staff contact information
Newspaper Articles	10 years	city staff work with local newspaper quarterly	Quarterly	$5,600	Community Development Coordinator			Public audience through local newspaper	Articles to include City staff contact information
Web Pages and Social Media	10 years	city staff incorporate water conservation issues into existing social media and web page presence	Quarterly	$9,800	Community Development Coordinator			Social media provides opportunity for 2-way communications	
City Demonstration Activities and Public Presentations	10 years	City install water conservation features (landscape, fixtures, etc.)	when retrofits or new work is being undertaken	$7,100	Public Works Director Community Development Coordinator			The City's conservation measures will be publicly visible	
		Public presentations at City Council meetings	Bi-annually		Public Works Director Community Development Coordinator			Public audience at Council Meetings	This measure will help to provide information to decision makers on conservation issues and the City's Water Conservation Plan implementation
Customer Water Use Workshops and Landscape Design and Maintenance Workshops	10 years	City sponsored workshop for residents	Every three years	$3,667	Public Works Director Community Development Coordinator			Public participation and feedback	

Total Cost for Implementation of All Proposed Measures: $2,715,917

Notes:
All measures selected for implementation are included (see Appendix E)
Deadlines are based on time from the approval of the Water conservation Plan. For example '1 year' is 1 year from the time the plan is approved
Data collection is only for system-wide meters and the leak detection study. Future updates to the plan may consider more extensive monitoring once system baseline data is available.
For cost estimate basis, see Appendix E2: Cost and Water Savings Calculations for Efficiency Measures

Appendix G

Section 9-10 City Code

Water and Sewer Use Rate

A. No water or sewer main, or facilities of the City may be extended without the approval of the City.

B. The City may, at its own expense, extend its water or sewer mains as deemed feasible or necessary. The City may provide for such extensions in accordance with its Subdivision Regulations, by contract with any person desiring such extensions, or by improvement district. Any such contract shall be on terms approved by the City and may provide for the size of the mains or lines to be extended, the apportionment of the costs of the extensions, reimbursement provisions for subsequent connections onto such extension, or such other provisions as City Council deems in the public interest.

C. All such mains, lines, easements, and facilities connected to the City system shall be conveyed and dedicated to the City, free and clear of all liens and encumbrances.

9-9 Right of Entry

A. Whenever necessary to make an inspection or investigation to perform any duty, or to enforce any of the provisions of this Chapter, any authorized City representative may enter upon any building or premises served by City water or sewer at any reasonable time for such purposes. If the building is occupied, he shall present proper credentials and request entry. If such building is unoccupied, he shall make reasonable efforts to locate the owners or persons in possession of the premises and request entry. If entry is refused, he shall have recourse to all remedies provided by law to secure entry, including issuance of an inspection warrant by the Municipal Court.

B. The right of entry shall apply but not be limited to the following functions: to determine the location and conditions of all hydrants, pipes, fixtures, plumbing, and meters, to read meters, to make repairs, to perform dye and smoke tests, and to investigate violations of this Chapter.

9-10 Water and Sewer Use Rates

A. Water and sewer use rates will be calculated on the basis of a single family dwelling. An equivalency factor (EQR) will be applied to the base rate to scale fees to normal usage for the particular structure or business.

B. Rate Structure

TYPE OF FACILITY	PER UNIT/SPACE	SERVICE FEE	ADDITIONAL EQR
Single Family Dwelling	1.00	$36.00 per property	
Multiple Family Dwelling Townhouse	1.00	$36.00 per unit	.25 per public washing machine

Condominium			
Apartment Building	1.00 per apartment	$36.00 per property	.25 per public washing machine
Permanent Trailers Mobile Home Park	1.00 per space	$36.00 per property	
Overnight Mobile Home Park RV Park Campground	1.00 per Manager's Unit; .22 per space with sewer hookup; .11 per all other spaces	$36.00 per property	.25 per public washing machine; 1.00 per public dump station
Hotels, Motels, Bed and Breakfasts	1.00 per Manager's Unit; .16 per bed; .02 per kitchen facility	$36.00 per property	.05 per 1,000 gallons for swimming pools, hot tubs, etc; .25 per public washing machine .03 per bed
Hospitals Nursing Homes	.20 per bed	$36.00 per property	
Churches	1.00 per parsonage .01 per seat	$36.00 per property	.70 per social area or kitchen facility
Private Clubs	.01 per seat	$36.00 per property	.70 per social area or kitchen facility 1.00 per bar
Schools	.06 per student	$36.00 per property	
Offices Day Workers Medical Center	.30 per 1,000 sq. ft	$36.00 per property	
Small Shops	.30 per space	$36.00 per property	
Factories Plants Livery Barns	.50 per 1,000 sq. ft	$36.00 per property	
Movie Theaters Arenas	.50 per 1,000 sq. ft	$36.00 per property	
Grocery Store Market	.30 per 1,000 sq. ft	$36.00 per property	
Service Station	.50 per pump	$36.00 per property	
Car Wash	1.20 per wash bay	$36.00 per property	
Laundry (Public)	.25 per machine	$36.00 per property	
Laundry Business	1.00 per machine	$36.00 per property	
Taverns/ Bar	2.00 per 1st 20 seats .60 per additional 10 seats	$36.00 per property	
Food Service	2.00 per 1st 20 seats .60 per additional 10 seats	$36.00 per property	
Deli, Ice Cream Parlor	1.00 per 1st 20 seats .30 per additional 10	$36.00 per property	

	seats		
Beauty/Barber Shop	1.00 per property	$36.00 per property	
Private Swimming Pool	.05 per 1,000 gallon if on City Water or Sewer System		
Ouray County Historical Society Museum	1.00 per museum unit	$36.00 per property	
Daycare	.02 per child capacity	$36.00 per property	
Emergency Response Facility	1.00 per facility	$36.00 per property	

C. Water and Sewer Rates

1. Water Base Rate is $16.59 per month per EQR

2. Water Debt Repayment Surcharge is $7.00 per month per EQR, prorated for the first 1.0 EQR, plus $3.50 for additional EQR's. For a master billing account, each lot with a single-family residence or each RV space shall be charged $7.00 per month per unit. Section 9-10-D-2 shall not apply to the Water Debt Repayment Surcharge calculation with respect to doubling the rate for users outside of the City limits.

3. Sewer Base Rate $25.94 per month per EQR.

4. Service Fee is set out in Subsection B.

5. A discount of $36.00 shall be allowed if charges for entire year are paid in advance by February 15th.

D. Special Charges

1. If any user is discharging toxic or other pollutants in concentrations higher than that of a residential user which causes increased treatment or system costs, a surcharge may be imposed based upon the excess concentrations.

2. All water user rates for users outside of the City limits shall be classified according to the above contained and set forth classifications, but the rates therefore shall be twice the rates applicable to users inside the City limits.

3. In all special cases where the water and sewer user does not come within any of the above set forth classifications and does not use a water meter due to unusual circumstances, or to unusual or intermittent requirements of the use of water and sewer, City Council may establish a special rate therefore, but no such special water and sewer rate contract shall be entered into for a period longer than one (1) year at a time and the rate or

rates for such special usage of sewer and sewer under any special contract shall be based as nearly as may be practical upon general water and sewer rate structure herein provided.

4. In cases where there is a transfer of City utility account customers due to the conveyance of property served by the City's water and sewer system, there shall be a $25.00 Utility Account Transfer Charge billed to the new property owner as a new customer of the utility account. This charge shall be incurred and billed at the time of such transfer, with payment due within thirty (30) days of billing.

E. Additional Provisions

All customers shall be required to properly complete and submit to the City, information, declarations, and surveys upon the City's request, as appropriate to facilitate the administration of this Chapter and the EQR system.

9-11 Restriction of Water Use

A. City Council, by a majority vote, may limit the use of City water to specific times, days, and uses as appropriate. Water use contrary to such limits is unlawful.

B. Action to limit the use of water shall comply with the local disaster emergency provisions of Chapter 2 of this Code.

C. No watering hose larger than 3/4" diameter and no watering nozzle larger than 1/4" diameter may be used.

D. All watering and continuous water flows shall be terminated during fire alarms.

E. Unlawful Acts

The following shall be considered unlawful and are declared a nuisance:

1. It shall be unlawful for any person to sell or give water away to be used on premises other than those for which service is authorized. The City may authorize temporary use at construction sites or in emergencies.

2. It shall be unlawful to open or close any fire hydrant, stop, or curb valve, or to turn on, or turn off, the water service to any property without lawful authority to do so.

3. It shall be unlawful to cause or allow any pollutant to be introduced in the City water system or to cross connect it with any irrigation water system or other system.

4. It shall be unlawful to waste water.

9-12 Use of Fire Hydrants

Appendix H

City of Ouray Resolution No. 7 - 2012

A RESOLUTION OF THE CITY COUNCIL
OF THE CITY OF OURAY, COLORADO
(RESOLUTION NO. 7, 2012)

A Resolution of the City of Ouray implementing water conservation standards for 2012.

WHEREAS, the City of Ouray received notice from the Colorado Division of Water Resources ("Division") that the City' s water rights were called on May 3, 2012; and

WHEREAS, the City submitted an Emergency Substitute Water Supply Plan to the Division in response to the water call on June 13, 2012 in order to allow the City to still draw the allocated water right amounts; and

WHEREAS, the Division has notified the City that the Emergency Substitute Water Supply Plan must include that the City demonstrate efforts by the citizens of the community to conserve water; and

WHEREAS, pursuant to Section 9-14 of the City of Ouray Municipal Code, the City Council has authority to limit the use of City water to specific times, days and uses as appropriate;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF OURAY, COLORADO, as follows:

THE CITY COUNCIL ASKS CITIZENS WHOSE PROPERTY IS EAST OF THE CENTERLINE OF MAIN STREET TO LIMIT YARD IRRIGATION TO ONLY TUESDAYS, THURSDAYS, AND SATURDAYS. THE CITY COUNCIL ASKS CITIZENS WHOSE PROPERTY IS WEST OF THE CENTERLINE OF MAIN STREET TO LIMIT YARD IRRIGATION TO WEDNESDAYS, FRIDAYS, AND SUNDAYS. THE CITY COUNCIL ASKS THAT ALL CITIZENS NOT CONDUCT YARD IRRIGATION ON MONDAYS NOR BETWEEN THE HOURS OF 10:00 AM AND 4:00 PM. WATERING BY A HANDHELD HOSE IS EXEMPTED FROM THESE WATER CONSERVATION STANDARDS.

THE CITY OF OURAY WILL ONLY CONDUCT DUST CONTROL OPERATIONS THREE DAYS A WEEK AS NEEDED. LIKEWISE, THE CITY OF OURAY WILL LIMIT IRRIGATION OPERATIONS IN ALL CITY PARKS TO ONE DAY A WEEK.

THIS RESOLUTION SHALL BE EFFECTIVE UPON ADOPTION.

ADOPTED this 6th day of August, 2012, by the Ouray City Council.

CITY OF OURAY, COLORADO

By_____
Robert E. Risch, Mayor

ATTEST:

_____
Kathy Elmont, City Clerk

X:\Clerk\Council\Resolutions\2012\res1207.doc

Appendix I

Leak Survey Proposal- UTS, Inc.

UTILITY Technical Services, Inc.

PO Box 3613, Englewood, CO 80155
Phone: 303-773-2808 Fax: 303-799-3436

WATER SYSTEM LEAK SURVEY PROPOSAL
FOR THE
Town of OURAY, COLORADO
For
Wright Water Engineers

Ryan Huggins
Water Resource Consultant
Wright Water Engineers
Durango, CO

Februray 14, 2014

Per our phone conversation this morning, the cost of a water main leak survey for the Town of Ouray, Colorado water system would be $3500-4500 which cover up to 60,000 lineal feet of pipeline. Expenses are not included. Expenses added would be mileage to and from Ouray @ .55 per mile, lodging and meals. The survey would be completed in 3-4 days. Terms are net 30 days. These prices could change if conditions stated were to change.

If awarded, UTILITY TECHNICAL SERVICES, INC. proposes that the survey take place before summer irrigation systems are turned on. This will allow the survey to proceed without usage interference. This leak survey proposal is valid for ninety (90) days after receipt. A certificate of insurance can be provided upon your request.

Please note that this does require accurate mapping/drawings of the portion of the system being survived and the help of one knowledgeable water employee.

We hope that this proposal meets with your approval. Please feel free to call or email with any questions.

Attached is our proposed leak survey equipment and procedure

Dave Anderson

Thank you for your inquiry to **UTILITY TECHNICAL SERVICES, INC.** As a qualified contractor for your water system leak survey, we would like to offer the following for your consideration.

UTILITY TECHNICAL SERVICES, INC. specializes in helping municipal and private water districts locate unaccountable water losses throughout their systems. Established in 1985, this Colorado owned and operated firm has helped hundreds of communities throughout the western region of the United States in solving their water problems with excellent results.

As an active member of the Colorado Rural Water Association, the Wyoming Rural Water Association, the Wyoming Water Quality & Pollution Control Association, and the Rocky Mountain AWWA for the past twenty years, **UTILITY TECHNICAL SERVICES, INC.** understands the current problems facing the water industry.

The two major factors concerning unaccountable water loss are 1) leakage and 2) inaccurate metering. **UTILITY TECHNICAL SERVICES, INC.** addresses these two problems by providing complete water system leak surveys, leak locates, and comprehensive leak reports. UTILITY TECHNICAL SERVICES, INC. also offers a yearly leak detection survey contract. This yearly contract includes a no charge follow-up call on problem areas when our technician is in the area, less any expense charges incurred while there. Please let us know if you would like more information regarding our yearly contract

Proposed Methodology

The leak survey begins at one end of the system (or portion of the system) to be surveyed, and proceeds section by section until that portion is completed. The sensors are placed at intervals determined in part by the pipe size, material, as well as availability of access and pressure. Larger pipe diameters, non-metallic pipe, and low pressures require closer contact points. Generally, the set-up length desired on a water distribution system is one city block. Commercial set-ups vary depending on external noise loads. On metallic pipelines, magnetic sensors are placed on gate valves, fire hydrants, or service line connections.

The key to our method is that all spans of pipeline are scanned for leak noise through the full frequency range and not just at convenient contact points. This is crucial, since we have seen leaks that are not detectable by any other method. If pipeline access is relatively easy, as in main line valves or fire hydrants at each intersection, the survey can proceed quite rapidly. Minimum survey quantity is two miles per day, but with proper preparation, along with knowledgeable assistance, four to five miles are possible. The equipment will also detect multiple leaks on a single set-up. If necessary, leaks can be detected and pinpointed at much greater distances, over 2,000 lineal feet in some cases.

Weather conditions generally do not affect the survey, however, snow cover and frozen valve boxes will hamper the progress of pinpointing leaks.

Leaks can be pinpointed later, after the entire system is surveyed, or at the time of the survey. If pinpointing is carried out during the survey, the utility department can start excavating and making repairs early. Pinpointing later reduces the chances of chasing down consumption noises.

Equipment

The equipment used is the SubSurface LC-2500 leak noise correlator. This includes the correlator (micro-processor) itself, radio transmitters, which amplify and send the noise (vibration) signals to the correlator, accelerometers, which are used for metallic pipe contact. Accelerometers pick up the noise from the pipe wall. The correlator includes multiple noise frequency filters, with a total of 20 ranges that can be combined in a number of arrangements. This allows the technician to scan many overlapping frequency range location, and size estimation. The correlator computes and gives the results on an LCD screen, whereby the operator can make his determining decision.

The Subsurface LD-18 Professional Water Leak Detector is also used. This instrument includes an amplifier with meter display, filter controls, ground microphone and hand switch. The large meter display of sound loudness, allows the user to pinpoint the exact leak location. This instrument is used to verify the correlator results.

Procedure

The leak survey begins at one end of the system (or portion of the system) to be surveyed and proceeds section by section until completed. The sensors are placed at intervals determined in part by the pipe size and material, as well as the availability of access and pressure. Generally, the set-up length desired on a water distribution system is one city block, or approximately 350 feet. Before we arrive, the city should locate and clean valve boxes as needed, as well as provide a detailed map that includes pipe size, type, and location to avoid delays in the survey. We require that the district furnish one knowledgeable person with a vehicle to assist in the survey. This person will:

1. help the technician in placement of sensors on the pipeline;
2. offer helpful information on pipe size, type, or layout, if different than mapping;
3. act on behalf of the district concerning public relations;
4. open or close PRVs, related valves, fire hydrants, or customer service valves;
5. aid in directing traffic, if required, in order to insure the safety of all.

Results

Records of all Set-Ups, measurements, and leak locations are kept in a Daily Report. The Leak Location Form is provided to the district for each leak found. The district provided map is also clearly marked with leak noise locations, which are in turn keyed to the individual leak record sheets. Leak noises are classified from slight to heavy based on the frequency with which they best respond. This information is utilized by the client to set priorities for repairs as well as to estimate the quantity of water loss. An average survey will produce one leak per mile of pipeline with the average leak size at 5 to 6 gpm. Results will vary depending on pipe age, system pressure, bedding materials, and total percentage of unaccounted for water. Using one truck with equipment, a survey will take in four to five miles a day under normal working conditions. Individual leak locates average about thirty minutes each, if there is no interference.

Technician

In the distribution field since 1973, **David Anderson** has a background that puts him in touch with the needs of the water industry. Firstly, Dave was in sales for two of the leading suppliers of waterworks equipment in the Midwest and Western United States, and secondly, he was a manufacturing representative for MUELLER CO. Dave has also contributed papers to the AWWA, which were published in the national handbook "Introduction to Water Distribution Systems".

He has helped conduct leak detection seminars for the AWWA, Washington State Department of Social and Health Service, Colorado Rural Water, Wyoming Rural Water, South Dakota Rural Water, New Mexico Rural Water and for the National Rural Water Association. Dave has also received factory meter training.

REFERENCES

1.	Town of Castle Rock Mr. John Chrestensen Water Superintendent Phone: 303.814.6408	25 – 50 miles, surveys annually since 1990
2.	Town of Gunnison Mr. Joe Doherty Water Superintendent Phone: 970.641.8330 Email: joe@cityofgunnison.co.gov	surveys annually since 1986
3.	Town of Breckenridge Mr. Gary Roberts Water Superintendent Phone: 970.485.0156 Email: gary@townofbreckenridge.com	approx. 25 miles, surveys annually since 1989
4.	Town of Laramie Mr. Cal VanZee Water Superintendent Phone: 307.721.5206 Fax: 307.742.7174 Email: cvanzee@ci.laramie.wy.us	approx. 25 miles, surveys annually since 1993

Appendix J

Public Notices and Request for Comments

Affidavit of Publication

COUNTY OF OURAY)
) SS.
STATE OF COLORADO)

Alan Todd

being duly sworn, deposes and says:

1. That he is publisher of the **Ouray County Plaindealer**, a weekly newspaper printed and published in the City of Ouray, County of Ouray, and State of Colorado.

2. That the said Ouray County Plaindealer was established and has been printed and published in said County continuously and uninterruptedly during a period of at least 52 consecutive weeks prior to the first issue thereof containing said **LEGAL NOTICE**, a copy of which is hereto attached.

3. That the said Ouray County Plaindealer is printed and published in whole or in part in the said County of Ouray.

4. That the said Ouray County Plaindealer is a weekly newspaper within the meaning of "An Act Concerning Legal Notices, Advertisements and Publications and The Fees of Printers and Publishers Thereof and To Repeal All Acts and Parts of Acts in Conflict with the Provisions of this Act," being Chapter 139 of the Session Laws of Colorado of 1923 as amended by Chapter 113 of the Session Laws of Colorado of 1931. The Act amended and repealed by Chapter 139 of the Session Laws of the State of Colorado of 1923 is Chapter 169 of the Session Laws of the State of Colorado of 1921, the same being Sec. 5392 to 5400, both inclusive, of the Compiled Laws of the State of Colorado of 1921, as well as all subsequent statutes governing legal publications.

5. That the said annexed Legal Notice was published in the regular and entire editions of the Ouray County Plaindealer, a duly qualified newspaper for that purpose, within the terms of the above named Acts.

6. That the said annexed **Legal Notice** is a full, true and correct copy of the original which was regularly published in each of the regular and entire issues of said weekly newspaper, a legally qualified newspaper for that purpose, for 1 successive weeks, and that the publication thereof was in the issue(s) dated:

July 10, 2014

Publisher

Subscribed and sworn to before me this 4 day of August 2014

My Commission expires: 6/14/2015

Beecher Threatt, Notary Public

PUBLICATION FEE:

16.53

BEECHER THREATT NOTARY PUBLIC STATE OF COLORADO

Legal Notice No. 1341165

NOTICE OF PUBLIC COMMENT PERIOD

The City of Ouray has prepared a draft Water Efficiency Plan in order to evaluate, prioritize and implement water efficiency activities. The implementation of the Plan will help the City to improve water demand forecasts, plan for infrastructure needs, and manage its water demands within its physically and legally available water supply. All of the measures are voluntary and are subject to City Council approval and budget constraints. The Ouray City Council will consider adoption of the Plan at the August 4, 2014 Council meeting. Public comments on the Plan must be submitted by 10:00 am on August 1, 2014. The plan is available for review at www.cityofouray.com. A paper copy of the plan is available for review between 8:00 am and 4:00 pm at the City Hall front desk, 320 6th Avenue, Ouray, CO 81427. Comments may be submitted in person at City Hall or via email to morgenthalera@cityofouray.com.

Published: Ouray County Plaindealer: July 10, 2014

the WATCH

OURAY – The City of Ouray is calling for public input on the draft Water Efficiency Plan the city council is considering for adoption at its Aug. 4 regular council meeting.

The plan has been crafted to evaluate, prioritize and implement water efficiency activities in Ouray. Its implementation will help the city to improve water demand forecasts, plan for infrastructure needs and manage water demands within its physically and legally available water supply.

"It will help us to understand what our usage is, also looking at how we are managing and, in appropriate places, conserving water in a smart way, while getting utilization we want," said Ouray Mayor Pam Larson when the draft water plan was first introduced last spring.

The plan was created by Wright Water Engineers, Inc., with funding provided by a grant from the Colorado Water Conservation Board. It follows the CWCB's municipal water efficiency plan guidance document.

According to City Administrator Patrick Rondinelli, having an adopted Water Efficiency Plan is often a requirement in order for municipalities to access grant funds from the CWCB to pay for further water projects.

"Once the plan is adopted, it opens up opportunities to access grants we can't do today," he said.

The proposed plan focuses on collecting data to better understand how water is used in Ouray, and how the city can achieve cost savings and decrease uses that do not bring the city revenue.

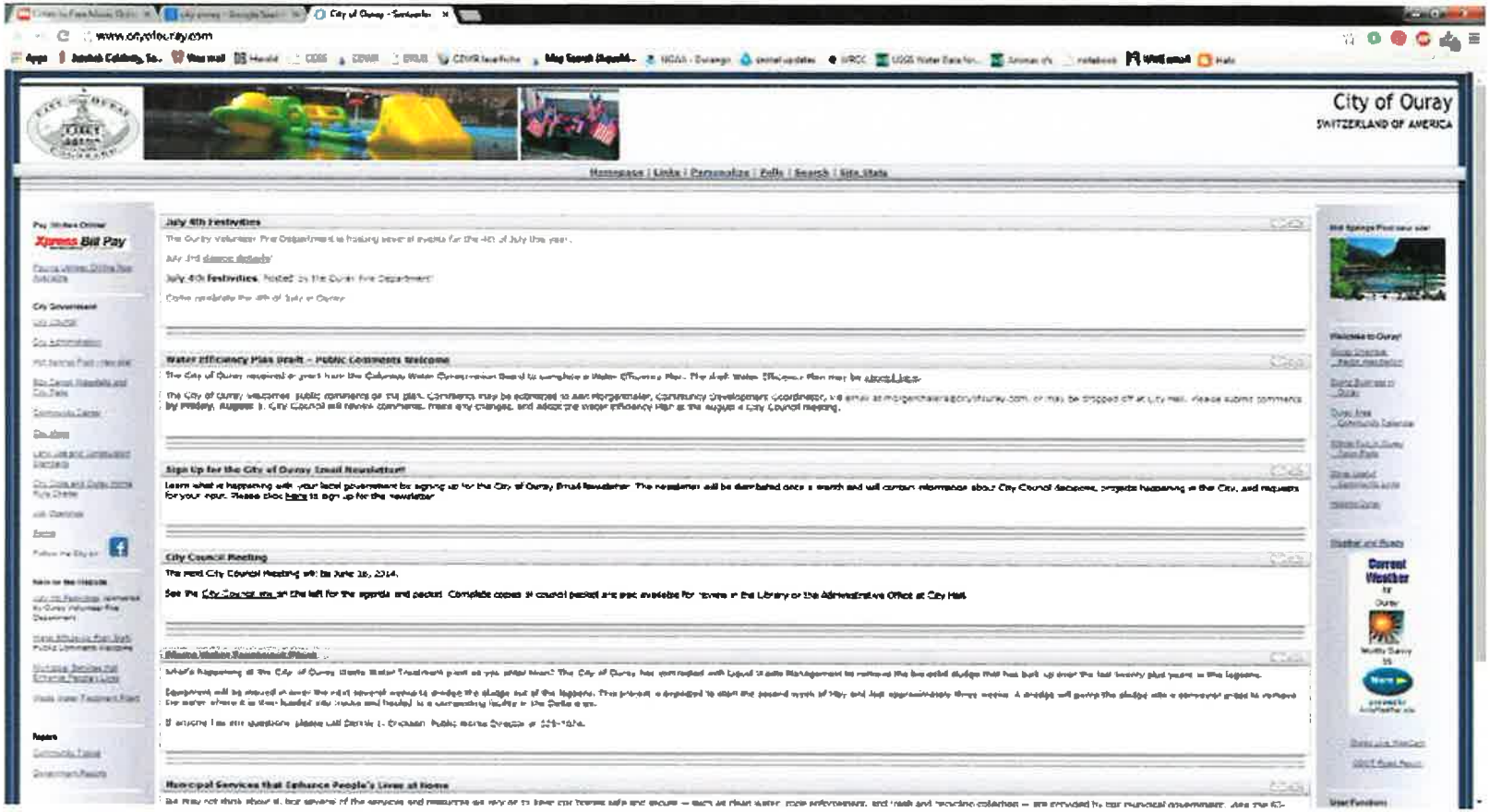
"For example, if the city could decrease inefficient use or leaks in the water system, the city may have additional water available to run through the micro-hydro system, which is revenue generating," Rondinelli explained.

One of the goals outlined in the plan is to add meters on pressure regulating valves in key places throughout the city's water system, to help understand overall water usage in the town.

All of the measures outlined in the plan are voluntary, and are subject to City Council approval and budget constraints.

The plan is available for viewing on the city website (cityofouray.com), as well as at the City Hall front desk. Questions or comments can be submitted via e-mail to Ann Morgenthaler, Community Development Coordinator, atmorgenthalera@cityofouray.com. Written comments can also be submitted at the City Hall. In either case, written comments must be submitted by 10 a.m. on Friday, Aug. 1.

swright@watchnewspapers.com or Tweet @iamsamwright



http://www.cityofouray.com/

http://www.cityofouray.com/docs/CommunityTopics/WaterEfficiencyPlan-DRAFT04-17-14.pdf

City of Ouray Monthly Newsletter

July 11, 2014

Another Amazing 4th

Thank You from City Administrator Patrick Rondinelli

Another 4th of July has come and gone in the City of Ouray. This year was another success with what many people feel was the largest crowd ever to come to the City for the holiday. With this wonderful day, it is important to recognize the many groups, organizations, and volunteers that work very hard to pull together all the events throughout the day. I would like to thank the Ouray Chamber Resort Association, the Mountain Air Music Series, the City's Public Works Crew, the Ouray Police Department, and the Ouray Volunteer Fire Department for everything they do to make the 4th of July spectacular.

Read more information about the 4th of July from Patrick Rondinelli by clicking here.

Share your Feedback:

What did you love about this year's 4th of July celebrations in Ouray? What would you like to see changed or improved? Please email us at newsletter@cityofouray.com to share your feedback.

Ouray Police Department

Updates from Chief Justin Perry

The Ouray Police Department finished up a great month in June, handling 381 incidents and kicking off City of Ouray's community policing programs. We had meetings with our Neighborhood, Business, and Traffic Safety groups, all of which were dedicated to community policing education and program initiation. The programs are completely community-oriented, with an emphasis dedicated to building partnerships within the community to solve problems and prevent crime. Our next Neighborhood meeting will occur on July 23rd at 7pm, and the Business meeting on July 30th at 7pm, both of which will be held at the Community Center. Dates for the Traffic Safety Program and School Program will be forthcoming. The Ouray Police Department invites all citizens to attend and participate in any or all of the programs. Together, we will ensure that the City of Ouray maintains the safe, family-oriented environment we all love and respect. Contact Chief Perry at perryj@cityofouray.com with questions.

City Council Vacancy

Details of Procedure for Filling Vacancy

The Ouray City Council regretfully accepted the resignation of Council member John Ferguson during the Council meeting on Monday, July 7th. While Council member Ferguson's resignation was a surprise, the City Council and staff greatly appreciate his service to our community and we all wish him the best in the future.

Per section 2-5-C of the Home Rule Charter for the City of Ouray:

> Vacancies on the Council shall be filled by the affirmative vote of a majority of the remaining Council members. A person appointed to the vacancy shall serve until the appointed term concludes.

The City Council has chosen to follow the same format as they have for other appointments to fill Council vacancies. They are asking any qualified citizen that is interested in serving on the City Council to submit a letter of interest to the City outlining why you would like to serve as well as what your qualifications are to serve on the City Council. Any citizen that is interested must meet the qualifications for elected officials as stated in section 2-1 of the Home Rule Charter:

> Registered electors of the City of Ouray, Colorado, who have resided within the City boundaries for one (1) year immediately preceding their election or appointment to office are eligible for nomination and service as Council members. Residency within an area annexed by the City during this time frame shall count toward the residency requirement. No Council member may be an employee of the City. A City employee must terminate his or her employment with the City upon commencement of the term of office as a Council member.

City Council is requesting that all letters of interest be submitted to City Hall by 4:00 PM on Monday, August 11th. In addition, City Council will ask all individuals that submit a letter of interest to attend the City Council meeting on Monday, August 18th to provide a

brief statement to Council and answer questions from the Council. It is at that meeting that the City Council will take action to appoint an individual to fill the remaining 3+ years of Council member Ferguson's term (until November of 2017).

If any citizen is interested but would like more information, the City staff is happy to share information about the role of a City Council member and any information about the City organization, policies, or City Code. Please contact Patrick Rondinelli at 325-7060 or at rondinellip@cityofouray.com.

Water Efficiency Plan Draft

Public Comments Welcome

The City of Ouray has prepared a draft Water Efficiency Plan in order to evaluate, prioritize and implement water efficiency activities. The implementation of the Plan will help the City to improve water demand forecasts, plan for infrastructure needs, and manage its water demands within its physically and legally available water supply. All of the measures are voluntary and are subject to City Council approval and budget constraints. The City will consider adoption of the Plan at its August 4, 2014 Council Meeting. Public comments on the Plan are welcome, and must be submitted by 10:00 am on August 1, 2014. The plan is available for viewing on the website by clicking here, and is also available at the City Hall front desk. You may submit questions or comments via email to Ann Morgenthaler, Community Development Coordinator, at morgenthalera@cityofouray.com, or you may submit them at the City Hall front desk.

Wastewater Treatment Plant

Pond Dredging Continues

Crews are continuing to dredge material from the wastewater treatment plant ponds. Thank you for your patience during this lengthy process. The City expects that the dredging will be complete by July 25. Please contact Dennis Erickson, Public Works Director, at ericksond@cityofouray.com or 325-7074 with questions.

Contact: City of Ouray
320 6th Avenue
PO Box 468
Ouray, Colorado, 81427

Like us on Facebook

www.cityofouray.com

Appendix K

City of Ouray Resolution

No. 10 (Series 2014)

RESOLUTION NO. 10 (Series 2014)

A RESOLUTION BY THE CITY COUNCIL OF THE CITY OF OURAY ADOPTING A WATER EFFICIENCY PLAN

WHEREAS, on May 19, 2014, the Ouray City Council was presented with a draft water efficiency plan created by City staff and Wright Water Engineers, Inc.; and

WHEREAS, the City is committed to water resources sustainability and water conservation; and

WHEREAS, the City of Ouray understands the needs and benefits of long term water conservation measures and is committed to implementation of the Water Efficiency Plan; and

WHEREAS, a Water Efficiency Plan is a valuable tool to implement sustainability through responsible water management and conservation measures; and

WHEREAS, the City Council of the City of Ouray desires to approve a Water Efficiency Plan and submit said Plan to the Colorado Water Conservation Board for approval; and

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF OURAY, COLORADO, THAT THE WATER EFFICIENCY PLAN AS PRESENTED FOR USE BY THE CITY BE ADOPTED AND UTILIZED AS THE PRIMARY RESOURCE FOR WATER EFFICIENCY IN THE CITY OF OURAY.

ADOPTED this 15th day of September, 2014, by the Ouray City Council.

CITY OF OURAY, COLORADO

By Pamela J. Larson
Pamela J. Larson, Mayor

ATTEST:

Kathy Elmont
Kathy Elmont, City Clerk