WATER EFFICIENCY GRANT PROGRAM

WATER CONSERVATION IMPLEMENTATION GRANT APPLICATION

April 16, 2014

Submitted to:

Colorado Water Conservation Board

Office of Water Conservation and Drought Planning

Submitted by:

Town of Monument, Colorado

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Summary

This is a water conservation implementation grant application submitted by the Town of Monument to the Colorado Water Conservation Board, Office of Water Conservation and Drought Planning. Although Monument is not a covered entity, it has prepared a Water Conservation Plan. The Town is committed to water conservation, and intends to improve water loss management and control procedures in its service area. The first step in this process is to implement an AWWA M36 water audit which involves an audit of water supply and meter data. Town of Monument intends to contract with the WaterDM team which includes Water Matters! and Water Systems Optimization (WSO) to conduct the audit and provide recommendations for additional actions Monument might take to reduce system water loss. Concurrently, Monument intends to purchase leak detection equipment, one half of the cost will be borne by Monument; one half is included in this grant request. It is Monument's intention that the grant will enable staff to perform M36 audits going forward, and that the purchase of leak detection equipment will enable Monument to offer equipment and trained staff to both TriView Metro District and the Town of Palmer Lake to assist in their efforts to control water loss. (Palmer Lake and TriView Metro District were partners with the Town of Monument in preparing the recently approved Water Conservation Plan for the three entities.

The total budget for conducting the Water Loss Control audit and purchasing leak detection equipment is $32,911. The proposed budget does not include time or money for preparing this grant application. This proposal requests a implementation grant from the CWCB in the amount of $22,573 which is 100% of the total budget for consulting services and one half the cost of the leak detection equipment. The Town of Monument will contribute in excess of $10,000 in in-kind services (31% of total plan development budget) through provision of time and data during the water audit process, and half the cost of the leak detection equipment.

Assuming that grant funding can be provided in a timely manner, the water loss control audit, summary, and recommendations will be completed by the end of September, 2014 and the final report will be submitted to CWCB by November 30, 2014.

CWCB Water Conservation Implementation Grant Application Submittal Requirements

1. Name and contact information of entity seeking grant:

Town of Monument

Applicant: Town of Monument
645 Beacon Light Road
Monument, CO 80132

Contact: Thomas Tharnish, Director of Public Works
645 Beacon Light Road
Monument, CO 80132
719 481 2954
ttharnish@townofmonument.net

2. Selected firm and individuals to assist in development Monument's Water Loss Implementation Plan

The Town of Monument has selected Peter Mayer, P.E. Principal of WaterDM to conduct and manage the project along with subcontractors Linda Firth of Water Matters! and Reinhard Sturm of Water Systems Optimization to conduct the water loss control audit and prepare recommendations. The individuals listed below will assist in the completion of this project. The role of each individual is briefly described.

Individual, Title, and Organization	**Role**
Thomas Tharnish, Director of Public Works, Town of Monument Nick Harris, Superintendent	Project manager and primary point of contact for the City. Provide water production and use data, billing information
Peter Mayer, P.E., Principal, WaterDM	Project manager, water loss control auditor, report preparation
Linda Firth, Water Matters!	Technical liaison, audit review, report preparation, and primary point of contact with Security
Reinhard Sturm, Water Systems Optimization	Technical review of and input on Water Loss Control Audit and recommendations for future action

3. Identification of retail water delivery and sources of water of the entity for past five years

Monument's source of supply is entirely groundwater, drawing on both Denver Basin aquifers and alluvial wells.

	Produced	Total Billed
2008	116400000	100104000
2009	121250000	104275000
2010	125250000	107715000
2011	129096000	111329000
2012	147325000	124099000

4. Reasonable engineering estimate of future annual retail demand for the next five years

Monument's reasonable engineering estimate of future annual retail demand for the next five years is shown in the table below:

Year	Projected Population	Projected AF Demand
2014	2331	401
2015	2366	407
2016	2401	413
2017	2437	419
2018	2473	425

5. Background characterizing the water system, potential growth and any other pertinent issues that relate to the stated evaluation criteria.

The Town of Monument, established in 1879, is located in El Paso County, bordered by National Forest on the west, the United States Air Force Academy to the south, foothills and rock outcroppings to the north and rolling plains to the east. It covers approximately 5 square miles. Monument expects slow to modest growth, in line with that of Colorado Springs (about 1.5% per year). Monument will maintain and expand its current course of efficient use of its water supply, while looking for new supply to meet the demands of its moderate growth projections

Both plants remove iron and manganese and provide for disinfection in accordance with applicable regulations. Monument owns a total of nine wells. It has one storage tank with a capacity of 1 million gallons. Monument has sufficient adjudicated water to meet its present and immediate future needs, but its ability to pump and deliver that water is constrained both by its infrastructure and by the dwindling reliability of Denver Basin groundwater. Monument's water system serves primarily single-family homes, but also serves a few multi-family homes, about 100 businesses, a mobile home park and a bulk fill station. The Town has 20 miles of mains and three pressure zones.

Monument has an annual supply of over 132 million gallons. All is groundwater, pumped from Denver Basin and the alluvium formation. Each of its nine wells is 100% metered. Monument plans to build a new water storage tank within the life of this Plan. They are in the process of changing transponders for their AMR system. This change, when fully implemented, is expected to save the Town significant water. Staff believes data is already showing savings of note.

a) Current and Past Per Capita Demand. Per capita demand is calculated by dividing total water deliveries by service area population.

Town of Monument population, system per capita demands

Year	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Population	1986	2017	2174	2196	2218	2240	2263
System per capita water use (gallons)	114	108	121	108	155	158	178

b) Past and Present Population and Forecast. The population in Monument's service area from 2006– 2012 is presented in the table above. Monument's population is expected to reach 2437 by 2017, which represents an additional 140 people. This is a 6% increase in population over 2012. Population projections are based on Town records for utility connections, and past growth as the basis for growth projections, considering regional growth trends.

Population and Water Use Projections - Town of Monument

		Residential Water Use		**Commercial Water Use**			
Year		Projected Growth Rate	Projected Water Use-af	Projected Growth Rate	Projected Water Use-af	Non-Revenue Water-af	Total Projected Water Use-af
	2012	1.5%	225	2.0%	110	55	390
	2013	1.5%	228	2.0%	112	55	396
	2014	1.5%	232	2.0%	114	55	401
	2015	1.5%	235	2.0%	117	55	407
	2016	1.5%	239	2.0%	119	55	413
	2017	1.5%	242	2.0%	121	55	419

c) Estimated Water Savings to be Achieved by Implementation. This project will not save "wet water" by itself, but rather establishes the foundation for future water savings by improving Monument's understanding of water losses in the supply system and identifying how these losses can be best addressed and managed in the future. Monument currently estimates that its unaccounted for water is an average of 13 to 15 percent per year. Monument hopes to improve understanding of water loss in its service area through this process and to better understand if water losses are largely real or apparent.

d) Adequacy, Stability, and Reliability of Water System. The Town of Monument has water resources to meet water demands through 2018 and beyond. The reliability of its supply in the future is constrained by the existing limitations on ground water in the Denver Basin aquifers, its ability to gain approval for development based on lower than historical AF:family ratios, and recurrence of drought. Its ability to obtain new renewable supply from surface water is constrained by the general shortfall of 18% in the Arkansas River Basin and the very limited availability of surface water rights in the region.

6. How will Grant Program monies be used?

The detailed scope of work below describes how the grant monies will be used to complete the Water Loss Control Audit and recommendations for the Town of Monument.

Scope of Work

In the project, the consulting team of WaterDM, Utility Management Consulting, and WSO will use the IWA/AWWA Water Audit Method published in the AWWA Manual of Practice M36 to conduct a "top down approach" desktop water audit for the Town of Monument. The results of the desktop audit will be reviewed by international water loss expert Reinhard Sturm of WSO. A staff member from WSO will come to Colorado to meet with Monument staff and the consulting team to discuss the findings of the audit and to establish recommendations to Monument for next steps that can be taken to improve water loss control and management.

The **key deliverables** of this project will be:

1. Completed desktop water audit using the free AWWA Water Loss software (which is an Excel-based spreadsheet tool)
2. Brief report outlining the findings of the water audit and presenting recommendations for next steps that Monument can take to improve water loss management and control.
3. 50% and 75% completion report and final report submitted to CWCB in accordance with grant requirements.

Task 1 – Purchase Leak Detection Equipment

The Town of Monument has budgeted for, and plans to purchase leak detection equipment to use in conjunction with a program of continuing M36 audits to control its non-revenue water. The

Town plans to make this equipment and a technical staff member available to its sister communities, Palmer Lake and Tri-View Metropolitan District. The Town has obtained quotation from National Meter and Automation, Inc. in Centennial, CO for a Zcorr 3 Logger System, which includes 3 loggers, software kit, docking station, data cable, and ship kit container for $8920.00 and annual service for 3 to 8 loggers for $576.00, totaling $9496.00 as shown in the budget.

Task 2 - Conduct Desktop Water Audit

The utility water auditing process that will be implemented in this project is an internationally recognized tool for improving understanding and management of water loss, considered a best practice by the American Water Works Association. The water audit provides crucial information to water utility that enables effective water loss control measures to be implemented in the future.

Through the water loss auditing process, the Town of Monument will work with the WaterDM consulting team to quantify consumption and losses that occur in the distribution system and the management process of the utility.

The "top down" or desktop audit approach is the recommended first step for a water utility following the AWWA M36 procedures, and the AWWA Water Loss Control Committee has developed truly useful and free auditing software built as an Excel spreadsheet.

Task 2.1 Preliminary Meeting

Peter Mayer and Linda Firth will meet with Tom Tharnish and his staff from Monument to launch the project. At the meeting the team will review the project goals and scope of work, the project schedule, and will provide a list of the data input requirements for the desktop audit.

The essential component of the M36 water audit approach is the water balance calculation that provides a preliminary assessment of water loss. Through this process, water system input volume is divided into two fundamental categories: authorized consumption and losses. The summary results from the water balance portion of the water audit compares distribution system input volume with the sum of customer consumption and losses (estimated or known).

Task 2.2 Data Gathering

Monument staff will provide the WaterDM team with the reports and data necessary to complete the desktop audit. It is in this task that Monument will contribute in-kind value to the project. During the data gathering process, it is anticipated that the Town staff will become familiar with the M36 process and approach so that in future years it will be able to conduct audits on a regular and recurring basis.

Task 2.3 Desktop Audit

Peter Mayer will prepare the preliminary desktop audit using the data provided by Monument. Next Peter Mayer and Linda Firth will conduct a working session with Monument staff to review the preliminary audit, obtain additional information from Monument staff, and finalize the initial audit. Once Monument and the consulting team have reviewed and approved the desktop audit draft, the technical review can commence.

Task 4 – Technical Review and Meetings with WSO

Reinhard Sturm, an internationally recognized water loss control expert and Vice President of Water System Optimization will review the Monument water loss control audit prepared by WaterDM. Reinhard or a member of his staff will travel to Colorado to meet with Monument and WaterDM. In a half day workshop, this group will develop recommendations for future action that can be taken to mitigate water loss and to improve utility water loss management in Monument.

Task 5 – Report Preparation

WaterDM will prepare a brief report (5 – 10 pages) summarizing the findings of the water loss control audit and explaining the recommendations for future action. Linda Firth will review and provide input to the final report and it will be submitted to Security. Monument's comments and edits will be incorporated into the final report.

WaterDM and Linda Firth will prepare 50% and 75% completion reports, as well as the final report as required by CWCB.

7. How will the Water Loss Control project be monitored to ensure results?

Results of this project can be monitored through the work products themselves – the completed Excel audit and the final recommendations and report.

Monument will evaluate the recommendations of the project and determine how best to proceed with water loss control in their district.

Detailed Budget

A detailed budget for conducting the Water Loss Control Audit and developing recommendations for Monument is shown in Attachment A. This table presents the hourly billing rates for all people expected to spend time on this project; the total cost by task; and an estimate of the hours that will be spent by each person on the project. The total cash budget for the project is $22,573. The total in-kind budget for the project is $10,338 (31%), including half the cost of the leak detection equipment. The combined total budget is $32,911.

8. Signature with authority to commit resources for the Town of Monument

This grant application is approved and submitted by the Town of Monument by

Thomas A. Tharnish Director of Public Works

Name, Title

Water Conservation Implementation Grant Budget Attachments A and B- Town of Monument, CO																			
Work Items	Consultant								Town of Monument In Kind and Cash							CWCB Grant Request	Total Project Cost		
							Total								Total				
	Peter Mayer DM		Linda Firth - WM!		Reinhard Sturm - WSO		Consultant	Leak Detection		Tom Tharnish		Nick Harris							
	Hrs/$150	Subtotal	Hrs/$150	Subtotal	Hrs/$185	Subtotal	Cost	Equipment	Cash	Hrs/$165	Subtotal	Hrs/$100	Subtotal						
Task 1 - Purchase Leak Detection Equipment																			
Zcorr 3 Logger System								$8,920	$4,460					$4,460		$4,460	$8,920		
Annual service for 3 loggers								$576	$288					$288		$288	$576		
Subtotal								**$9,496**	**$4,748**					**$4,748**		**$4,748**	**$9,496**		
Task 2 - Conduct Desktop Water Audit																			
2.1 Preliminary Meeting	6	$ 900	4	$ 600			$ 1,500			2	$ 330	2	$ 200	$ 530		$1,500	$ 2,030		
2.2 Data Gathering	6	$ 900	4	$ 600			$ 1,500			2	$ 330	4	$ 400	$ 730		$1,500	$ 2,230		
2.3 50% completion report to CWCB	2	$ 300	2	$ 300			$ 600			1	$ 165		$ -	$ 165		$600	$ 765		
2.3 Desktop Audit	20	$ 3,000	4	$ 600			$ 3,600			15	$ 2,475	5	$ 500	$ 2,975		$3,600	$ 6,575		
2.4 75% completion report to CWCB	1	$ 150	2	$ 300			$ 450			1	$ 165			$ 165		$450	$ 615		
Subtotal	**35**	**$ 5,250**	**16**	**$ 2,400**			**$ 7,650**			**21**	**$ 3,465**	11	**$ 1,100**	**$ 4,565**		**$7,650**	**$12,215**		
														$ -			$ -		
Task 3 - Technical Review Meetings with WSO	16	$ 2,400	8	$ 1,200	25	$ 4,625	$ 8,225			5	$ 825	2	$ 200	$ 1,025		$8,225	$ 9,250		
Subtotal	**16**	**$ 2,400**	**8**	**$ 1,200**	**25**	**$ 4,625**	**$ 8,225**			**5**	**$ 825**	**2**	**$ 200**	**$ 1,025**		**$8,225**	**$ 9,250**		
																	$ -		
Task 4 - Final Report Preparation	8	$ 1,200	5	$ 750			$ 1,950									**$1,950**	**$ 1,950**		
Subtotal	**8**	**$ 1,200**	**5**	**$ 750**			**$ 1,950**									**$1,950**	**$ 1,950**		
TOTAL	**59**	**$ 8,850**	**29**	**$ 4,350**		**$ 4,625**	**$ 17,825**	**$ 9,496**	**$ 4,748**	**26**	**4290**	**13**	**1300**	**$10,338**		**$22,573**	**$32,911**		
District inkind contribution equals 31%																			
Timeline for Implementation																			
Attachment B																			
Task	**Completion Date**																		
Task 1 Purchase Leak Detection Equipment	August 30 2014																		
Task 2 - Conduct Desktop Water Audit																			
2.1 Preliminary Meeting	May 30 2014																		
2.2 Data Gathering	May 30 2014																		
2.3 Desktop Audit	July 30 2014																		
Task 3 - Technical Review Meetings with WSO	August 30 2014																		
Task 4 - CWCB Report Preparation																			
4.1 50% Report	July 30 2014																		
4.2 75% Report	September 30 2014																		
4.3 Final Report	November 30 2014