STATE OF COLORADO

Colorado Water Conservation Board
Department of Natural Resources
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TO: Colorado Water Conservation Board Members

FROM: Veva Deheza, Office of Water Conservation & Drought Planning

DATE: March 6, 2012

SUBJECT: **Agenda Item #21, March 20-21, 2012 Board Meeting**
Castle Pines Metropolitan District Water Efficiency Grant

Staff Recommendation: Staff recommends that the Board approve a Water Efficiency Grant for Castle Pines Metropolitan District in the amount of $115,752 to purchase and install an Advanced Meter Infrastructure (AMI) Fixed Based System with water consumption analysis software.

Summary of Proposal
Castle Pines Metropolitan District (the District), a non-covered entity located in Douglas County, Colorado is requesting $115,752 in Water Efficiency Grant Funds to purchase and install an Advanced Meter Infrastructure (AMI) Fixed Based System to monitor and track water consumption on an hourly basis. The District's Water Conservation Plan was approved by the CWCB in October 2010. The District's water supply comes solely from groundwater sources but the District is currently locating renewable water sources with a goal of using 75% renewable water in the future. The District recognizes the significant role water conservation needs to play to ensure adequate future water supplies.

The AMI system will support the District's new "Advanced Demand Side Leak Detection and Irrigation Efficiency Program" by detecting water leaks ranging from toilet leaks to irrigation mainlines, eliminating excessive irrigation, effectively managing monthly water consumption and effectively projecting water demand and associated revenues. Additionally, the AMI program will integrate AquaHawk Alerting, a water consumption analysis software program and web based water conservation and customer communication system. Through collection of hourly water consumption data, the AMI system will support water conservation initiatives by providing alarms for high and low usage, continuous and no usage and reverse flow. The decreased latency in reading meters reduces the amount of water loss due to leaks that otherwise might negate the savings garnered from ongoing water conservation measures.

Through implementation of AMI, the savings estimates for the District's leak detection and irrigation efficiency programs total 131 acre feet of water over 8 years. This project will help achieve the overall goal of 16% estimated savings stated in their Water Conservation Plan.

The total cost of the project is $231,467. The District is requesting $115,752 in Water Efficiency Funds and they have committed $115,715 in cash which is a 50% match.

Attachments:
- Castle Pines Metropolitan District Application
- Application evaluation criteria ranking sheet, scored by CWCB staff

CASTLE PINES

METROPOLITAN DISTRICT

CWCB Office of Water Conservation & Drought Planning Section
1313 Sherman St., Room 721
Denver, CO 80203
303.866.3441
303.866.4474 Fax

Wednesday, March 7, 2012

Dear Mr. Wade;

Enclosed is an application for a Water Efficiency Grant, the Water Conservation Program Implementation Grant opportunity for Castle Pines Metropolitan District (CPMD.) CPMD Staff and the Board of Directors developed the application materials. Questions regarding this document can be directed to the Water Conservation Coordinator, Emily Coll at 303.688.8330.

According to CPMD's Water Conservation Plan (WCP) on file with the CWCB, water consumption is projected to be reduced by 16%. However, after evaluating the water conservation measures outlined in the WCP, this savings will not be realized. CPMD has taken action and implemented a new program, Advanced Demand Side Leak Detection and Irrigation Efficiency Program.

CPMD engaged in a six month pilot project which resulted in the development of the Advanced Demand Side Leak Detection and Irrigation Efficiency program. Customers were not contacted until the last two months of the pilot project and from those contacts, the water loss of 7.56 acre-feet was prevented **if the discovered leaks would have continued to leak until the end of the billing cycle or when customers received their bills.** After speaking with each homeowner about the discovered leak, CPMD's Water Conservation Coordinator, Ms. Coll, determined which leak would not have been noticed until the bill was received by that homeowner. Ms. Coll used only the gallons associated with those leaks.

The results from the pilot project are astounding. Since CPMD has actively begun contacting customers in December 2011, CPMD has potentially saved 7.56 acre-feet **if the discovered leaks would have continued to leak until the end of the billing cycle or when customers received their bills.** Other Water Conservation Specialists along the Front Range and elsewhere in the west were asked about leaks and water use behaviors in their utilities' service area and it was determined that

the majority leaks or excessive irrigation water use is not discovered until the customer receives their water bill.

Also, water savings can also be realized through the irrigation efficiency portion of the Advanced Demand Side Leak Detection and Irrigation Efficiency Program. CPMD conservatively estimates that the majority of customers are over-irrigating by 15%. The projected water savings due to the funding of this grant and therefore implementation of this new program is approximately 131 AF in the eight years remaining in the 10-year period stated in the WCP.

The purpose of this grant application is to enhance CPMD's current Water Conservation Program by installing the Advanced Meter Infrastructure (AMI) Fixed Base System which is required in order to monitor and track water consumption on an hourly basis. This decreased latency in reading meters eliminates the sometimes massive leaks that negate the annual savings from the water conservation measures.

Castle Pines Metropolitan District is a committed agency to its Water Conservation Program and will continue to pledge its resources through staff and financial support.

Thank you,

Paul Dannels
District Manager
Castle Pines Metropolitan District

Encl: Castle Pines Metropolitan District Water Efficiency Grant Application, 2012

CWCB Grant Proposal – Advanced Meter Infrastructure Installation for Sustainable Water Conservation Savings

March, 2012

1. Entity Seeking a Grant

Castle Pines Metropolitan District
5880 Country Club Dr.
Castle Rock, CO 80104
(303) 688-8330
www.castlepinesmetro.com

2. Identification of Retail Water Delivery by Customer Category* 2007 – 2011

* Customer categories identified are those that represent the majority of water use and those that are directly targeted by CPMD's Water Conservation Program.

Castle Pines Metropolitan District (CPMD) supplies water to the residents of Castle Pines Village, a small commercial development, and two residents who live outside of the Village. 100% of the water supplied came from groundwater sources. CPMD is in the process of locating renewable water sources with a goal of using 75% renewable water. The following table shows total quantified retail, potable, residential water delivery from 2007 – 2011.

Table 1 – 2007-2011 Water Use by Customer Category, GCPD and Annual Demands

Category	2007	2008	2009	2010	2011
Sub-Association Homes	141	166	120	148	144
Custom Homes	654	723	587	670	668
Village Lake Homes (non-irrigation)	17	20	22	23	23
Total Metro Homes (Total Acre-feet)	812	909	729	840	835
Population*	4196	4343	4392	4409	4417
Residential GCPD	164	184	147	170	169
Annual Demand (AF)	1021	1219	981	1049	1097

*Population District records and Colorado Department of Local Affairs (CDOLA)
GCPD = Gallons per Capita per Day

CPMD's past population was determined by past records and CPMD's predicted future population information was determined from CPMD's Water Conservation Plan.

CASTLE PINES
METROPOLITAN DISTRICT

Table 2 - Estimated Population 2007 to Present and Predicted Future Population

Year	Population
2007	4196
2008	4343
2009	4392
2010	4409
2011	4417
2012	4417
*10-yr projected growth	5570

* As per CPMD's Long-Range Master Plan build-out projections.

Castle Pines Metropolitan District expects the potential growth to be approximately 400 more residential connections for a total of 2,000 connections by 2020. CPMD is committed to guaranteeing that each new meter installed is compatible with the AMI system and will be captured through AMI infrastructure acquired by CPMD with grant funds. A significant amount of capital improvement projects will need to be implemented to ensure a large enough water supply for the demand without conservation efforts detailed in the grant application.

3. Grant Request Overview and Justification

Castle Pines Metropolitan CPMD (CPMD) is seeking a Water Efficiency Grant to fund a water conservation implementation project which is to install Advanced Meter Infrastructure (AMI) Fixed Base System to aid in the implementation of the CPMD's new Advanced Demand Side Leak Detection and Irrigation Efficiency program. This program integrates a water consumption analysis software program and web-based water conservation and customer communications system called AquaHawk Alerting™. The costs associated with AquaHawk Alerting™ are not part of the grant request. However, this new and progressive program would not be as successful without AquaHawk Alerting™. The objectives of this program are to:

- Quickly detect water leaks from toilets to irrigation mainlines,
- Eliminate excessive irrigation,
- More effectively manage monthly water consumption,
- More effectively project water demand and associated revenues.

Conventional water conservation programs rely mostly on educational, fixture-replacement, leak detection and irrigation related rebate programs. Water savings associated with these programs are many times difficult to ascertain and therefore make it virtually impossible to

incorporate water savings associated with conservation programs into water supply planning initiatives.

Due to the over-allocation of water resources across the country, conservation programs will be required by water providers and state and federal agencies to take control of water demand in order to adequately manage water resources for the growing population. The installation of AMI and statistical analysis of consumption data associated with AMI is a new technology. This process has the potential to be invaluable to water resource managers and federal and state stakeholders who deal with state or nationwide water supply issues.

Advanced Meter Infrastructure (AMI) Fixed Base System collects meter data and alarms from the utility meter base and transmits the data wirelessly to one or more Tower Gateway Basestation (TGB) data collection points. AMI provides two-way communication from the host computer to the TGB and to the installed meter transceivers (MXU's). The AMI system will be designed to provide coverage for all meters in CPMD's service area in order to collect all the consumption data. AMI system infrastructure also has associated software programs. AMI systems support conservation initiatives by providing alarms for high/low usage, no usage, continuous usage, and reverse flow. It could also be used to determine which customer if any are irrigating against regulations. However, the existing AMI software programs do not statistically analyze consumption data and correlate to greater than 13 month historical consumption data, nor do they correlate consumption data with irrigable land space and local irrigation requirement values.

CPMD has evaluated its Water Conservation Program which is detailed in the CWCB approved Water Conservation Plan (WCP). The evaluations resulted in CPMD saving an estimated 51.56 AF from 2007 to 2010. According to these results, CPMD will not realize the projected water savings of 16% system wide by 2019 as projected in the WCP. This 16% projected savings was used in CPMD's long-term strategic financial planning to reduce or eliminate capital improvement projects by approximately $8.5 million.

CPMD has utilized these results to modify the existing Water Conservation Program as outlined in the WCP and pilot a **new** water conservation measure in 2011, Advanced Demand Side Leak Detection and Irrigation Efficiency Program. This program was developed in collaboration with American Conservation Billing Solutions, Inc. (AmCoBi) to provide CPMD staff a report flagging properties with higher than average usage or anomalous usage. A report is generated from the AquaHawk Alerting™ software which analyzes consumption data using a variety of statistical analyses. This program also aids in **target marketing** other water conservation efforts, i.e. rebate programs, to those customers who would benefit most from participating in the incentive-based water conservation measures.

Prior to the pilot program, if CPMD detected high usage on a customer's account, the leak could have been running for 30 days or longer. The latency or delay in the standard notification/billing cycle is too long to allow customers to fix problems or change their usage patterns in order to positively affect annual water demand. A decreased latency in acquisition of consumption data aids water providers to discover leaks more quickly and determine the level of irrigation efficiency without conducting an on-site irrigation

assessment or audit. This decreased latency will be achieved regardless of staff availability to read meters due to the installation of the AMI technology.

CPMD's Advanced Demand Side Leak Detection and Irrigation Efficiency pilot program ended January 1, 2012. Throughout the pilot project CPMD staff read meters twice per week when staff was available using Automated Meter Reading (AMR) technology. AMR is a technology that has been on the market for approximately ten years. This meter reading technology allows water, gas and electric providers to read meters using radio frequency which reduces the labor involved with the traditional methods of reading meters as well as the accidents and Worker's Compensation associated with those traditional methods.

AMI takes this technology a step further because of its ability to acquire and store consumption data on an hourly basis. AMI takes the human element out of the data acquisition process which is important with limited staff availability, an issue many providers encounter. AMI systems decrease the consumption data acquisition latency to an hourly basis. This decreased latency would increase the robustness of CPMD's Water Conservation Program by enhancing the leak detection and irrigation efficiency program. These changes to CPMD's Water Conservation Program will be reflected in the seven year WCP update.

CPMD staff received 27 AquaHawk Alerting™ reports since the pilot project began July, 2011. The AquaHawk Alerting™ reports include alerts which are meters that have higher than average use and will show those meters that have irrigation inefficiencies, i.e. broken heads, leaking mainlines, etc. Each report has 200 total leak alerts, of which100 are potential domestic or indoor leaks and 100 are potential irrigation leaks. Each report also has a variable number of zero use reads and the supporting data for each account. CPMD staff has collaborated with AmCoBi throughout the pilot project period to refine the analyses which naturally narrows down the amount of alerts included in each report.

CPMD staff received three quotes for an AMI Fixed Base System. Out of the three systems quoted, the Sensus FlexNet Fixed Network System is the only system that would work for CPMD. Dana Kepner is the distributor for Sensus products in this region and therefore CPMD would purchase materials from Dana Kepner as well as use them to install the equipment. Currently, FlexNet systems are installed in local communities of Fort Collins/Loveland, Golden, and mountain communities. During Golden's pilot program in 2011, many irrigation leaks were found by the Parks and Recreation Department as well as a customer that had a malfunctioning irrigation controller that would run every night on a default program unbeknownst to the customer.

Pagosa Area Water and Sanitation CPMD (PAWSD) installed the Mosaic Mesh AMI system in 2009. Statistics drawn directly from the AMI show **456,000 gallons were** lost in 2009 due to leaky toilets, dripping faucets, etc. **732,000 gallons** was lost in 2009 to outdoor irrigation issues consisting of irrigation lines equaling 385,000 gallons and yard Hydrants lost 347,000 gallons. **1.3 million** gallons were lost due to frozen/broken pipes last winter alone (2009/10). These statistics were provided by Mat deGraaf, the Conservation Coordinator for PAWSD.

Although it is difficult to determine how to define water saved, CPMD uses a method that calculates the amount of gallons that would have would have continued to leak until the end of the billing cycle or when customers received their bills. This method is defensible due to the unique characteristics of the population served by CPMD. Many customers are gone for the whole winter or for long periods of time in the winter and summer. The total gallons lost minus the "normal" use for that account or meter equal the gallons saved.

The results from the pilot project are astounding. Since CPMD has actively begun contacting customers in December 2011, CPMD has potentially saved 7.56 acre-feet **if the discovered leaks would have continued to leak until the end of the billing cycle or when customers received their bills**. Other Water Conservation Specialists along the Front Range and elsewhere in the west were asked about leaks and water use behaviors in their utilities' service area and it was determined that the majority leaks or excessive irrigation water use is not discovered until the customer receives their water bill.

Also, water savings can also be realized through the irrigation efficiency portion of the AquaHawk Alerting™ software. CPMD conservatively estimates that the majority of customers are over-irrigating by 15%. AquaHawk Alerting™ will identify these properties and the projected water savings is approximately 131 AF in the eight years remaining in the 10-year period stated in the WCP.

In monetary terms, CWCB considers one acre-foot of water to be worth $25,000.00 in acquisition of renewable water. This means that in approximately two months of actively contacting customers, CPMD has potentially saved $189,000.00.

There is also a monetary benefit to the customer besides water bill savings and that is property damage savings. Water damage can be incredibly costly and CPMD provides a great customer service benefit by participating in this program and helping customers avoid costly property damage. However, CPMD also cannot be held liable for detecting leaks and therefore the language used to market this program must be chosen carefully.

The gallons prevented from being lost during the pilot project including January of 2012, which is one month more than the pilot period, were 7.56 acre-feet or 0.9% of the total supplied for 2011. CPMD estimates that the projected savings using actual savings demonstrated in the pilot project will move CPMD much closer to its goal of 16% system wide savings over a 10-year period than relying solely on the measures identified in the Water Conservation Plan (WCP) on file with the CWCB.

The long-term objectives of this program are to ensure that a decrease in water consumption occurs due to conservation activities, that water conservation program savings can be used in water supply planning initiatives and to provide evaluations to the CWCB that demonstrate the effectiveness of this conservation system. AMI integrated with AquaHawk Alerting™ could be a foundational element for every water conservation program in Colorado.

AquaHawk Alerting™ software incorporates evapotranspiration (ET) rates, localized irrigation requirements (IR), and landscape irrigable area data and successfully combines

these elements to help their customers irrigate more efficiently. By targeting water leaks and excessive irrigation, this project has the ability to save approximately 7.5 acre-feet of water every year in leaks alone, as demonstrated by the pilot program illustrated above, by providing a system-wide conservation system. It offers an additional value of promoting proactive communications between water providers and their customers to encourage customers to act quickly and become more aware of their water use behavior.

Also, using the prevented loss from the pilot project of 7.56 acre-feet and a conservative estimate of15% savings in improved irrigation efficiency, the estimated savings over the remainder of the ten-year WCP period is 16%. The cost is estimated to be $**231,467.00**. The amount of the grant request is $**115,752.00.** CPMD will allocate $115,715.00 in cash. CPMD will also commit $1,072.50 per month for the hosting service and maintenance contract and the salary of the Water Conservation Coordinator to manage the program.

CPMD staff has determined that this project best be implemented in one phase with project completion as close to the beginning of irrigation season as possible in 2012. Grant funding and CPMD funding may not be allocated for 2013 or beyond and therefore CPMD staff believe it best to retrofit the whole system in one year.

If a small district like CPMD could prevent the loss of millions of gallons in one year like has been shown in the pilot project, then larger water providers could prevent the loss of enough gallons to close the statewide gap between water supply and water demand, projected and actual. This program has the capability to demonstrate to these water providers that there is a favorable ROI for installation of an AMI system. Also, AMI and the accompanying AquaHawk Alerting™ greatly increase customer satisfaction by closing the workflow communication feedback loop which is a very important element for any water provider.

Estimated 4-year Savings – 2007 through 2010

CPMD has had an active demand-side Water Conservation Program since 2007 and had implemented supply-side conservation activities like a system-wide leak detection program and recycled backwash in the treatment process since the District's inception in 1986. The demand-side conservation activities began with rebates for weather-based irrigation controllers and free irrigation audits through the Center for ReSource Conservation. CPMD hired a Water Conservation Coordinator in March 2009 and from there the program evolved into a much larger program supporting five irrigation related rebates, numerous educational events for landscapers and homeowners, and more intensive leak detection measures.

CPMD will not evaluate 2011 programs until after the 2012 season. CPMD used AmCoBi's AquaHawk Analysis™ software program to evaluate conservation programs. In the past four years, CPMD estimates that 51.56 AF were saved due to conservation activities. The table below details each program and the estimated gallons saved. A negative value means participating customer's usage increased that year.

Table 3 – CPMD's 2007 to 2010 Water Conservation Program Estimated Savings per Measure

Program	2008 Savings (AF)	2009 Savings (AF)	2010 Savings (AF)
Slow the Flow 2007	4.26	18.02	-
Slow the Flow 2008	-	1.04	-0.23
Slow the Flow 2009	-	-	-0.51
ET Controller Rebate 2007	3.15	18.02	11.55
ET Controller Rebate 2008	-	1.11	0.53
ET Controller Rebate 2009	-	-	-0.24
ET Controller Rebate 2010	-	-	-3.03
Irrigation Audit 2010	-	-	-2.45
ET Controller Programming Education 2009	-	-	0.17
ET Controller Programming Education 2010	-	-	0.17
Totals	**7.40**	**38.19**	**5.97**
Cumulative Total			**51.56**

In four years, CPMD has saved 51.56 AF due to conservation programs. However, the program that has been piloted has shown 7.56 AF in **two months** of actively contacting customers. Throughout the pilot project reads were taken twice per week when labor was available. The proposed project will take reads on an hourly basis regardless of staff availability. The grant funding will secure the implementation of the project and ensure associated water savings.

Also, leaks and irrigation inefficiencies may negate the water savings associated with conservation activities. This new program will identify leaks and irrigation inefficiencies before the lost water exceeds conservation program savings and essentially becomes the primary conservation effort.

Projected Savings

Water savings will be realized from the two parts of this program, demand-side leak detection and identification of irrigation inefficiencies. The District is small enough that the Water Conservation Coordinator has the capability to inspect each property with a leak or irrigation inefficiency, recommend appropriate changes and follow-up to ensure the changes have been made.

The table below details the projected water savings associated with the grant project and CPMD's new conservation measure, Advanced Demand-side Leak Detection and Irrigation Efficiency Program. The savings are conservatively estimated using the actual savings of 7.56 AF realized in the pilot project which focused on the leak detection piece. CPMD used

the best available data to estimate savings associated with leak detection. The savings associated with the irrigation efficiency piece are estimated using customer irrigation consumption data.

CPMD conservatively estimates that 50% of customers over-irrigate by 15% and that only 25% of these customers will change their water-use behavior. By the third year of the program 25% of customers over-irrigate by 15% and that 10% of these customers will change their water-use behavior. Finally, CPMD estimates that by the 8th year of program implementation 5% of customers over-irrigate by 15% and that 5% of these customers will change their water-use behavior.

Table 4 – Projected Savings from Advanced Demand-Side Leak Detection and Irrigation Efficiency Measure

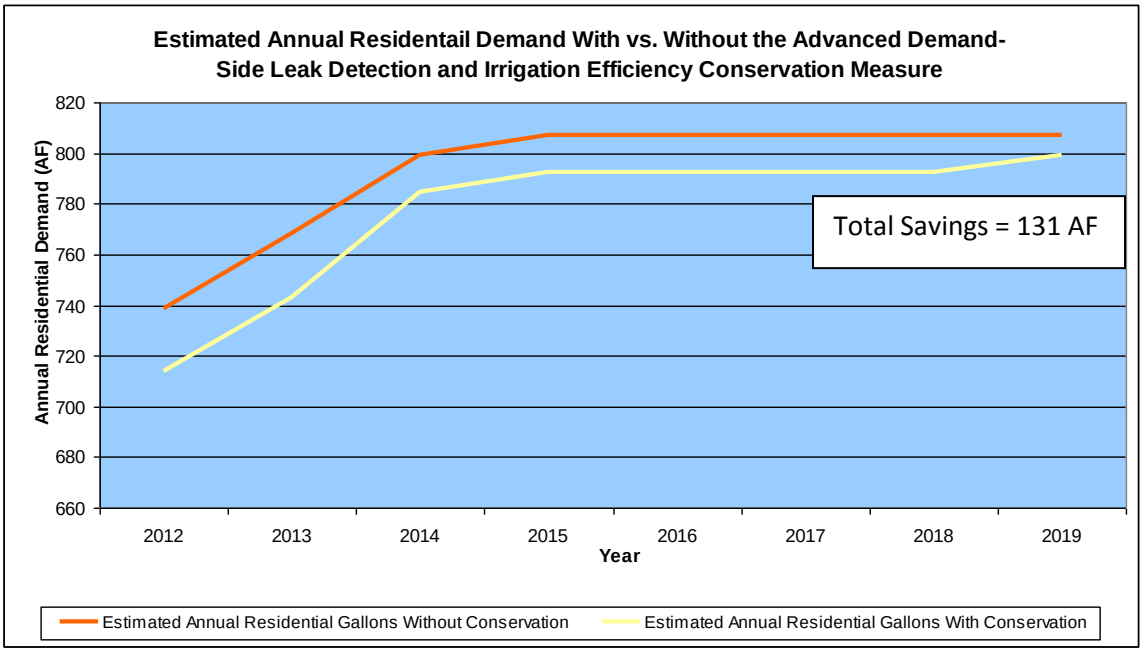
Grant Project	Grant Project Description	CPMD Conservation Measure	Projected Savings (AF) - 1st yr	Projected Savings - 3rd yr	Projected Savings (AF) - 8th yr	Projected Savings (AF) - 8 yrs	Projected Demand in 2019 as per WCP	% Savings by 2019
Advanced Meter Infrastruc-ture	Provides capability to acquire consumption data hourly	Advanced Demand Side Leak Detection and Irrigation Efficiency Program - AquaHawk Alerting™	25	15	8	131	807	16%

The Water Conservation Coordinator conservatively calculated customers average historical irrigation consumption in June, July and August not including raw water delivered for irrigation use which averages only about 14% of the total average historical irrigation water delivered. The raw water is metered and will be captured by AMI system but is not used in the estimated savings calculation because raw water has not historically been used in savings calculations. However, if the meters associated with the raw water delivery exhibit irregular or abnormal usage, then the Water Conservation Coordinator will conduct an audit of the system. The 5-year average CPMD customer irrigation use for June through August is 151,406,200 gallons or 464.65 AF.

Assuming 50% of customers over-irrigate by 15% and that only 25% of these customers will participate in conservation efforts and realize savings, then in year one and two 17.42 AF will be saved. Assuming 25% of customers over-irrigate by 15% and that only 10% of these customers will participate in conservation efforts and realize savings, then in year three through seven 6.97 AF will be saved. In year eight of the 10-year period, 0.35 AF will be saved assuming 5% of customers over-irrigate by 15% and that only 5% of these customers will participate in conservation efforts and realize savings. This equals a total of 70 AF for the irrigation efficiency portion of CPMD's Advanced Demand-side Leak Detection and Irrigation Efficiency Program.

The graph below illustrates the estimated annual residential demand with the implementation of the proposed project versus the annual residential demand without implementing this program.

Graph 1 – Estimated CPMD Annual Demand With and Without the Implementation of the Advanced Demand-Side Leak Detection and Irrigation Efficiency Measure



4. Project Team

The following is a list of professionals who will perform various activities and tasks associated with this project.

Emily Coll - Project Manager
Ms. Coll, Water Conservation Coordinator, is responsible for managing the project's scope of work, ensuring CPMD and its team are meeting appropriate timelines, and delivering progress reports for the CWCB Board. Ms. Coll will write the support documentation and other marketing materials such as direct mail letters, press releases, community newsletters and e-blasts for the implementation of the Advanced Demand Side Leak Detection and Irrigation Efficiency Program. Ms. Coll will be the primary point of contact to the CWCB.

Ms. Coll will also manage this project by working directly with Dana Kepner to ensure proper installation of all the equipment and will work with the Sensus Project Manager to ensure the data collection portion of this project is appropriately integrated with CPMD's existing data collection system.

Jeff Coufal – Operations Superintendent
Mr. Coufal, Operations Superintendent, manages the Operations Crew and is responsible for managing the CPMD's leak mitigation process as well as other factors affecting water use such as irrigation in open space areas of the Village. Ms. Coll will collaborate with Mr. Coufal and his staff to ensure the program is successful.

Sue Mantz – Accounting Supervisor
Ms. Mantz, Accounting Supervisor, is responsible for managing the Accounting and Billing Department which has previously been responsible for consumption data and contacting the homeowners regarding usage. Ms. Coll will collaborate with Ms. Mantz and her staff to ensure the program is successful.

5. Project Summary

The objectives of this program are to put control limits on the water system under the auspices of water conservation in order to use conservation program water savings in water supply initiatives and water resource management. Side effects of this program will be better water demand projections and associated revenue projections.

This project will ensure annual water savings by catching leaks with decreased latency as compared to prior to installation of AMI and also to utilize the web-based software system, AquaHawk Alerting™ that water providers will use to manage their customers' water consumption and proactively contact them via e-mail or telephone when leaks, over-irrigation, or other problems are detected.

CPMD will be empowered with capabilities to:

- Discover any size leak from leaky toilets to irrigation mainline breaks
- Measure if customers are irrigating properly
- Set a usage or price budget each month and be notified if their consumption is trending to exceed that limit
- Track how much water they are using and how much they are spending during the month
- See how they compare to similar residences.

Specific goals of the Advanced Demand Side Leak Detection and Irrigation Efficiency Program include:

1. Substantially reduce water unnecessarily lost to leaks and excessive irrigation
2. Make it easier for customers to manage their water consumption and monthly expenses
3. Provide a tool that aids Water Conservationists in performing their daily duties
4. Provide information to water providers so they can better target conservation activities and get the most out of their conservation investments
5. Measure the amount of water this conservation system saves
6. Determine if this system can be a model for water utilities throughout Colorado
7. Provide summary data about the project's water conservation results to the CWCB.

This program will transform the way water conservation incentives, education and outreach activities are developed, implemented and evaluated. Instead of implementing traditional conservation programs such as irrigation audits, rebates, and educational events that are one-time initiatives, affecting a small percentage of a water utility's customer base, AMI and the AquaHawk Alerting™ program will address all customers' water use behavior.

Conservation programs need to reach all water users in a community in order to positively affect annual demand. If annual demand can be more accurately projected, water resources can be better managed and allocated appropriately. AquaHawk Alerting™ software also aids in **target marketing** other water conservation efforts, i.e. rebate programs, to those customers who would benefit most from participating in the incentive-based water conservation measures.

An AMI Fixed Base System promotes water conservation by enabling water providers to:

- Quickly detect water leaks and excessive irrigation,
- Uncover theft and tampering,
- Discover inoperable water meters.

This program addresses the mission and objectives of the CWCB in numerous ways. For example, by working to eliminate water waste, providers can "avoid or reduce the need to develop or acquire new water supplies." They can also "postpone, downsize or avoid altogether the need for new water treatment or wastewater treatment infrastructure."

This program is intended to improve conservation results for water providers. Successful conservation will "reduce operating costs related to water and wastewater treatment and source water production."

The way this program focuses on communicating valuable information directly to water users will have tremendous public relations value for water providers and "improve public credibility by demonstrating stewardship of natural and financial resources."

Overall, this project "promotes the sustainable use of finite water supplies" in a way that may prove more effective than all other water conservation programs combined. The long-term objectives of this program are to ensure that a decrease in water consumption occurs due to conservation activities, that water conservation program savings can be used in water supply planning initiatives and to provide evaluations to the CWCB that demonstrate the effectiveness of this conservation system. AMI paired with AquaHawk Alerting™ could be a foundational element for every water conservation program in Colorado.

The specific tasks to be funded with the Water Efficiency Grant include AMI Fixed Base System cost and installation.

6. Project Scope of Work

- State the purpose and primary features of the project
- End products to be delivered
- Clear timelines
- Detailed narrative of all tasks to be performed before completion
- Include 50%, 75%, final report submissions
- Identify CPMD staff responsible for each task
- Identify funding sources

The purpose of this project is to purchase and install an AMI Fixed Base System which will be used as the primary water conservation program for CPMD. AMI Fixed Base System collects meter data and alarms from the utility meter base and transmits the data wirelessly to one or more Tower Gateway Basestation (TGB) data collection points. AMI provides two-way communication from the host computer to the TGB and to the installed meter transceivers (MXU's). The AMI will be designed to provide coverage for all meters in CPMD's service area in order to collect all the consumption data.

AMI will be used in conjunction with the AquaHawk Alerting™ program to provide a web-based water conservation and customer communications system that would enable CPMD to share information with customers so they can reduce unnecessary consumption and water waste.

Primary Features of the Project

1. AMI

Purpose and primary features of the project: The purpose of purchasing and installing an AMI Fixed Base System is to take CPMD's Water Conservation Program to a new level whereby the water system as a whole is being affected by conservation and to ensure 16% savings is achieved over the remainder of the10-year planning period.

End Product to be Delivered to CWCB: Two progress reports and a final report will be delivered to the CWCB.

Timeline: First progress report provided to CWCB at the time of completion of purchase and installation will be May 15, 2012; Second progress report provided to CWCB after the irrigation season October 31, 2012; Final report will be provided to CWCB December 15, 2013.

Tasks to be Performed:

- Research AMI Fixed Base Systems - CPMD
- Purchase AMI Fixed Base System - CPMD
- Supply and install AMI Fixed Base System – Dana Kepner
- Connect the AMI software to the AquaHawk Alerting™ database – CPMD/AmCoBi

- Monitor production and customer accounts daily - CPMD

Task Responsibility: CPMD will provide all the labor resources to manage and evaluate the project as in-kind contributions are **not** reflected in the overall cost of the project and grant. Dana Kepner will be installing the MXU's at each endpoint and their services will be paid for by CPMD.

Funding Source: $**231,467.00** is the overall cost of the project, $**115,752.00** will come from CWCB grant funds and will be used to purchase the AMI Fixed Base System. CPMD is committed to funding $115,715.00 for some infrastructure costs and all installation labor costs.

7. Detailed Project Budget

- Broken down by task
- Identifying all costs associated with the project -- labor hours, costs (in-kind and cash) other direct costs such as AMI materials and installation.

The total project expense to purchase and install the Advanced Meter Infrastructure is **$231,467.00.** CPMD is **requesting a grant in the amount of $115,752.00.** The grant would fund the purchase of 1 TGB, 1 Remote Repeater, and 932 MXU's purchased from Dana Kepner. CPMD will contribute $131,442.50, $115,715.00 of which will be in direct cash investment to purchase 1 TGB, 747 MXU's from Dana Kepner and the installation of the total MXU's by Dana Kepner which equals 1679. The other portion of the total CPMD will contribute includes CPMD's committed labor resources. Also, CPMD has already committed to spending $6,000 in 2012 to integrate the AquaHawk Alerting™ software program. The table below delineates the expenses associated with this project.

Table 5 – Detailed AMI Project Budget

CPMD AMI Grant				
Task	CPM Staff or Contractor + Hours	CPMD Cash Contribution	CWCB Grant Request	Project Total Expenses
Task 1 - Purchase AMI	Emily Coll - 30 @ $33.75/hr			
2 TGB's		$ 26,250	$ 26,250	$ 52,500
1 Remote Repeater		$ -	$ 9,350	$ 9,350
932 MXU's		$ -	$ 80,152	$ 80,152
747 MXU's		$ 64,280		$ 64,280
Task 2 - Install AMI	Dana Kepner - 160	$ 25,185		$ 25,185
Task 3 - Project Management	Sensus - 40, Emily Coll - 80 @ $33.75, CPMD Operations Crew - 40 @ $23.83, CPMD Accounting Staff - 30 @ $25.45	$ -	$ -	$ -
Task 4 - Annual maintenance & costs/year	Sensus - $1,072.50 per month = $9,652.50 (yearly total)	$ -	$ -	$ -
Total:	$ 15,081.70	$ 115,715	$ 115,752	$ 231,467

There are two building projects currently happening and both are expected to be completed in 2012. When these and other future homes are built, CPMD is committed to ensuring the meters installed are those compatible with the AMI system. Also, the current building project and future projects are in areas that will be captured by the AMI system which will be funded through this grant and no more infrastructure, other than the MXU's, will need to be purchased or installed.

The grant monies will be used to address CPMD's stated water savings goal of 16% over the remainder of the WCP 10-year period by providing the tool, AMI Fixed Base System, necessary to implement CPMD's new Advanced Demand Side Leak Detection and Irrigation Efficiency Program. CPMD's Water Conservation Coordinator will monitor the project daily to ensure that the project is implemented correctly and in a timely manner. The Water Conservation Coordinator will track findings and input them into a report entitled, "AquaHawk Alerting Outcomes."

The total savings associated with this project is 131 AF. Traditional water conservation measures and incentive programs such as rebates are becoming less favorable to water providers because the ROI for the water provider is not long-lasting and does not provide long-term savings that are necessary for long-term strategic supply planning and demand management. Results from CPMD's conservation program evaluations showed that conservation activities have approximately a two-year life span. Two years is not long enough to accurately aid in statewide planning initiatives.

The long-term objectives of this program are to ensure that a decrease in water consumption occurs due to conservation activities, that water conservation program savings can be used in water supply planning initiatives and to provide evaluations to the CWCB that demonstrate the effectiveness of this conservation system. AMI integrated with AquaHawk Alerting™ could be a foundational element for every water conservation program in Colorado.

This program addresses the mission and objectives of the CWCB in numerous ways.

- By eliminating water waste, water providers:
  1. "avoid or reduce the need to develop or acquire new water supplies."
  2. "postpone, downsize or avoid altogether the need for new water treatment or wastewater treatment infrastructure."

- By improving conservation results, water providers:
  1. "reduce operating costs related to water and wastewater treatment and source water production."

- By communicating valuable information directly to water users, water providers:
  1. improve public relations.
  2. "improve public credibility by demonstrating stewardship of natural and financial resources."

8. Signing Authority

Paul Dannels, District Manager, will commit the CPMD's resources to fulfill the tasks presented in this grant request. Mr. Dannels is authorized to submit this grant on behalf of CPMD.

Paul Dannels — Signature

3/7/12 — Date

District Manager — Title

To: **EMILY COLL**
CASTLE PINES METRO W & S DIST
5880 COUNTRY CLUB DR
CASTLE ROCK CO 80108

KEPNER

From: MOREY BALINS

Date: 1/18/2012
Quote: MB011812A

FLEXNET

CASTLE PINES METRO

Comments: **HOSTING INCLUDES RNI[REGIONAL NETWORK INTERFACE], MAINTENANCE ON ALL EQUIPMENT & CUSTOMER SERVICE CALLS.**

Terms & Conditions

The following terms and conditions apply to this quotation:

Due to the extreme volatility of raw material, energy, and transportation costs, the prices shown in this quotation are only valid for 30 days, with the exception of PVC Pipe prices. PVC prices will be subject to the Manufacturers price in effect at the time of shipment. Order releases and shipments delivered 60 days beyond the order date, or as stipulated, will be subject to the price in effect at the time of shipment.

Dana Kepner Company, Inc. is not responsible for manufacturers ability to ship material or hold prices.

Terms are net 30, and Quote is based on award of complete project.

Due to volatility in the copper commodity market, copper tubing pricing will be determined at time of shipment.

Connecting hardware for Non-DK supplied material is not included in bid, unless otherwise noted.

PVC Sewer Pipe may come in 13', 14', 20', & 22' lengths, based on availability. Regardless of product description in this proposal.

Quoted totals do not include taxes.

Thank you for the opportunity to quote this project.

Colorado Springs
P: 719.578.8733
F: 719.578.8428

Denver
P: 303.623.6161
F: 303.623.1667

Ft. Collins
P: 970.482.3311
F: 970.482.3389

FLEX NET

Qty	UM	Product Description	Unit Price	Total Price
2.0	EA	METRO MODEL 50 TGB	$26,250.00	$52,500.00
1.0	EA	REMOTE REPEATER MODEL 2 [2-WAY MINI METRO]	$9,350.00	$9,350.00
1,679.0	EA	510M1 MXU [510R1 TRADE IN]	$86.00	$144,394.00
1,679.0	EA	INSTALLATION COST[BASED ON CPM SET UP]	$15.00	$25,185.00
1.0	EA	MONTHLY HOSTING SERVICE COST [UP TO 2000 UNITS]	$1,072.50	$1,072.50
			FLEX NET Total:	$232,501.50

Name of Applicant: CASTLE PINES METRO DISTRICT
Date Received: 1/20/2012

HB 05-1254: Evaluation Checklist for Entities

For Covered Entity Applicant:	**Yes**	**No**	**Comments:**
Is the applicant a covered entity?		✓	
Does the covered entity have a state approved water conservation plan in accordance with statutory revision 37-60-126? (HB 04-1365)?	✓		APPROVED BY CWCB IN OCT. 2010
(If answered **no** to the above question) then, Does the covered entity have a locally adopted water conservation plan with defined water saving goals?			
Did the applicant provide a written statement from the entity's governing board, stating the entity's commitment to the project and the entity's commitment to implementing long-term water saving measures and programs (w/authorized signature)?	✓		Pg. 15
Did the applicant provide a cover letter with the entity's: name, contact information, and a signature of an individual with the authority to commit the resources of the entity?	✓		
Did the applicant provide a list of people and/or organizations that will be involved in assisting with the grant project (list of who will be utilizing the grant money)?	✓		Pg. 9
Characterizing Water System:	-----	-----	----------
Did the entity provide their annual retail water demand for the past five years (in acre ft. or million gallons)?	✓		Pg. 1 (TABLE 1)
Did the entity identify their retail water delivery for *each* of the past five years (in acre feet or million gallons)?	✓		Pg. 1 (TABLE 1)
(Not required, but preferred), Did the applicant provide information characterizing past water use by sector, (e.g. residential, commercial, and industrial) and the source (e.g. surface water, groundwater, etc).	✓		LISTS RESIDENTIAL SUB CATEGORIES Pg. 1 (TABLE 1)
Did the entity provide current (and *if available* past) per capita water use for the last five years and the basis for this calculation?	✓		Pg 1 (TABLE 1)
Did the entity provide their past, current, and predicted future population served by the entity, (and the source of this information)?	✓		Pg 2 (TABLE 2)
Did the entity state the water savings that was accomplished in the past five years through water conservation efforts?	✓		Pg. 6-7 - EST SAVINGS OVER 4 YEARS IS 51.5 AF
Did the entity state water savings goals to be achieved through the implementation of the "project"?	✓		Pg. 7-9 - GOAL OVER 8 YEARS = 131 AF
Adequacy, Stability, and reliability of the entity's water system *to be measured and examined by staff through analysis	✓		
Description of Project:	------	-----	----------
Did the applicant write a paragraph stating the purpose and the primary features of the project?	✓		Pg. 12
Did the applicant provide a **detailed** narrative (description) of tasks to be performed with grant monies (stating how grant money will be used to achieve project goals)? *(a "scope of work" can combine this item with the timeline described below)	✓		Pg. 12
Did the applicant provide a "project" timeline, stating milestones with dates and end products with dates; also state the estimated dates when progress reports will be submitted to OWCDP staff (50% & 75%	✓		Pg. 12

completion)?			
Did the applicant present a project budget overview, breaking down tasks by labor hours and costs also including all other direct costs such as travel per diem associated to the tasks? (Preferred in a schedule format)	✓		Pg 14
Does the applicant demonstrate 25% matching funds? Listing all funding sources to complete the "project"? In cash, in-kind services, or through payment of consulting fees or a combination thereof?	✓		50% MATCH $115,715 - CPM CASH $115,752 - CWCB