Water Efficiency Grant Application to the Colorado Water Conservation Board For Commercial Water Audits and Fixture Replacements

Pagosa Area Water and Sanitation District

Section 1 - Introduction and Background Information

The Pagosa Area Water and Sanitation District (PAWSD or the District), successor to the Pagosa Water and Sanitation District formed in 1971, was reorganized in 1977 to provide water and wastewater service to the Pagosa Springs, Colorado area, located in Archuleta County in the southwestern portion of the state. Through an inclusion election held in 1992, the Town of Pagosa Springs and areas served by the former Archuleta Water Company were successfully included into the District's boundaries for water service only, which nearly doubled the District's boundaries at that time. For reference purposes, the PAWSD service area is characterized as District One, which generally is the area west of Pagosa Springs, and District Two, generally the areas north, south, and east and including the Town of Pagosa Springs**.** A map of the PAWSD service area is provided in **Attachment A.**

Twenty-seven highly qualified, full-time PAWSD personnel manage and operate approximately 290 miles of water lines and 80 miles of sewer lines. The PAWSD service area encompasses approximately 70 square miles. PAWSD currently has 2,940 acre-feet of existing usable raw water storage, with an additional 1,047 acre-feet upon the completion of the enlargement of Stevens Reservoir.

Currently, PAWSD serves about 7,200 single-family equivalent (SFE) units which represent an estimated population of about 10,800. It should be noted, however, that this population estimate includes a very significant transient population of water and wastewater customers that utilize PAWSD services as they visit the area as tourists and/or property owners who reside in the community only on a part-time basis. To these customers, PAWSD provides both treated and raw water. The District also provides wastewater collection and treatment to the customer base in the western portion of the District boundaries (District 1). Additional detail of the water and wastewater systems is provided in Section 5 (d).

PAWSD total annual water use in 2008 was 2,436 acre-feet; therefore, PAWSD is a "covered entity" as defined in CRS 37-60-126.

Water Efficiency Grant Request Summary

For many utilities, including the District, water conservation is an important component of overall water supply planning. Actions to reduce water demand, decrease system losses, and increased operating efficiencies will benefit the District and its customers. To this point, the District recently updated its Water Conservation Plan in accordance with the Colorado state statute, expanding its supported measures and programs to include:

Residential Water Conservation Programs –

- Indoor appliance residential rebate programs for high efficiency toilets and washing machines.
- Whole house audits with giveaways –
- Irrigation audits and rebates –
- AMR Technology Installation and Meter replacement
- Residential customer workshops
- A campaign to reduce spillage at its fill stations.

Commercial Water Conservation Programs –

- Indoor appliance residential rebate programs for high efficiency toilets and washing machines.
- Commercial facility audits with giveaways
- Irrigation audits and rebates
- AMR Technology Installation and Meter replacement
- Raw water conversion projects
- Commercial and irrigation-only customer workshops
- Pilot project to demonstrate the value and use of waterless toilets and urinals

Other Education and Outreach Efforts –

- Regional water fair for 5th graders
- K-12 educational through the Water Wise$_{tm}$ Activity Kits and Project WET$_{tm}$,
- Public relations and messaging campaign
- Surveys and/or focus groups
- Upgrade its Xeriscape demonstration garden
- Upgrading and enhancing its web site

New Construction Ordinances and Requirements

Other Measures and Programs

- Water Rate Increases
- Leak Detection

Monitoring and Verification

The details of these various programs can be found in the District's 2008 Water Conservation Plan that was reviewed and approved by the CWCB Office of Water Conservation and Drought Planning (hereafter "the Office"), and is on file with the Office.

This Water Efficiency Grant request relates to PAWSD implementing a specific portion of its approved Water Conservation Plan. The District is requesting that the Office consider its request to fund a commercial water audit and fixture retrofit program. The District has recently concluded a pilot demonstration project which included auditing two local motels and three local restaurants, to identify potential water and related energy savings. This application has been developed based on the findings of that demonstration audit.

The proposed scope of work, presented as an attachment to this application, involves four key tasks:

- Continuing implementation of the newly developed public outreach program to engage and educate the public regarding the proposed audit and fixture replacement program and create interest in the program from the local business community;
- Conducting audits at selected area businesses (i.e., those businesses that are high water users and/or have volunteered to be audited);
- Purchasing and installing high-efficiency fixtures (including showerheads, faucet aerators, waterless urinals and dual-flush toilets); and
- Reporting on the program successes and challenges.

An overview of the proposed audit program is provided below.

The commercial audit program will include conducting audits of entire facilities, prioritized by total water use and customer willingness to provide access. It is anticipated that the vast majority of the audits will be performed at local motels and restaurants, and for that reason the methodology to be used in each of these types of commercial businesses are given in the paragraphs that follow.

The motel audits will include visiting individual rooms, laundry and housekeeping facilities, cooling and heating systems, ice machines, swimming pools, and where applicable, kitchens. During the audit, shower, toilet and faucet flow rates will be measured, and when appropriate, low flow fixtures will be installed in showers and/or on faucets. Pre-rinse spray nozzles will be installed as needed in kitchens and restaurants within the facility. Outdoor irrigation practices will be reviewed, including estimates of outdoor water use and demand (based on seasonal water use, irrigated acreage and irrigation practices), to determine if irrigation practices are consistent with the needs of the landscape. Educational materials will be provided and discussed with the property owners and/or managers regarding water conservation practices.

The restaurant audits will be similar to the motel audits in that the businesses will be selected based on total water use and customer willingness to provide access. The audit will include visiting restrooms, cooling and heating systems, refrigeration areas, and kitchens. During the audit, toilet and faucet flow rates will be measured, and when appropriate replaced with low flow fittings (for faucets only). Pre-rinse spray nozzles will be installed as needed in kitchens. Outdoor irrigation practices will be reviewed, including estimates of outdoor water use and demand (based on seasonal water use, irrigated acreage and irrigation practices), to determine if irrigation practices are consistent with the needs of the landscape. Educational materials will be provided and discussed with the property owners and/or managers regarding water conservation practices.

Water models will be developed for each facility that is audited to help characterize both indoor and outdoor water use. Each and every water using fixture and use will be incorporated into the facility specific water model to help identify water use trends and areas of potential water savings. The water models will be calibrated to average and

maximum monthly water use. Once the water model has been developed and calibrated, it will be used to estimate potential water and energy savings associated with a suite of fixture replacements and improvements in water use efficiency.

The District will track individual customer water use before and after the audits to help characterize the value and effectiveness of this particular water conservation tool.

To evaluate the effectiveness of the commercial audit program, the District conducted a demonstration audit program in the first quarter of 2009. These audits were used to identify and quantify facility specific water savings that could be achieved as a result of replacing fixtures with new, high efficiency fixtures.

Table 1 presents a summary of the number of possible fixture replacements identified during the demonstration audits. Table 2 summarizes the potential water savings and cost benefits related to the potential water savings.

Table 1 - Number of Possible Water Saving Fixtures and Appliances in Motels and Restaurants[1]

Customer	Toilets	Urinals	Showers	Bathroom Sinks	Other
Motels					
First Inn of Pagosa	**33**		**32**	**33**	
San Juan Motel	**45**		**45**	**59**	Leak Repair
Restaurants					
Junction Restaurant	**4**	**2**		**9**	
JJ's	**4**	**2**		**9**	Washing Machine
Boss Hogg's	**5**	**3**		**13**	Washing Machine
Totals	91	7	77	123	

Based on the results of the demonstration audit program, the District is prepared to move forward on the multi-pronged approach summarized above and described in detail in Attachment B.

[1] **The entire report related to the Demonstration Water Audits is attached to this grant request.**

Table 2 – Summary of Potential Costs and Water Savings				
Customer	**Estimated Cost of Fixture Replacements ($)**	**Acre-Feet of Water Saved**	**Payback Period for Fixture Replacements (yrs)**	**Value of Replacement Water ($)***
Motels				
First Inn of Pagosa				
Toilets	8,250		22	
Showerheads	864		0.11	
Sinks	297		0.15	
Total for Facility	**9,411**	**1.72**		**34,410**
San Juan Motel				
Toilets	11,250		38.	
Showerheads	1,215		0.23	
Sinks	531		0.26	
Leak Repair	5,500		0.37	
Total for Facility	**18,496**	**10.95**		**219,134**
Restaurants				
Junction Restaurant				
Toilets	1,000		3.4	
Urinals	380		4.9	
Sinks	81		0.03	
Total for Facility	**1,461**	**0.91**		**18,292**
JJ's				
Toilets	1,000		4.2	
Urinals	380		7.4	
Sinks	81		0.2	
Washing Machine	850		5.9	
Total for Facility	**2,311**	**1.11**		**22,211**
Boss Hogg's				
Toilets	1,250		6.1	
Urinals	570		5.8	
Sinks	117		0.1	
Washing Machine	850		10.	
Total for Facility	**2,787**	**0.98**		**19,672**
Totals	**34,466**			**313,719**

*** based on $20,000 per acre-feet for replacement water including storage, treatment and transportation**

Section 2 - Application

1. Name and contract information of the entity seeking the grant.

Contact : Shellie Tressler, Assistant Finance Manager
Pagosa Area Water and Sanitation District (PAWSD)
100 Lyn Avenue; PO Drawer 4610
Pagosa Springs, CO 81157
(970) 731-2691; (970) 731-2693 [Fax]
www.pawsd.org

Chief Executive : Karen Wessels, Chairman, PAWSD Board of Directors

2. Project Team and Organization

PAWSD will oversee and manage all aspects of the commercial audit program. Ms. Shellie Tressler, PAWSD Assistant Finance Manager and Conservation Program Supervisor will serve as the project manager and will receive assistance from Mat deGraaf, the District's Water Conservation Coordinator, who will be substantially involved in the project providing coordination, data management and report review.

Tracy Bouvette of Great Western Institute will provide the coordination and technical assistance needed to plan for and conduct the audits, including, but not limited to, coordinating messaging and outreach, conducting onsite audits, installing showerheads and faucet aerators (as appropriate), performing data analyses and cost estimating, and reporting on verified water savings and project outcomes.

Nancy Brockman of Chimera Communications will support the District's educational and outreach efforts during implementation of the project. She will guide the newly developed "Catch the Wave" messaging into proper external channels, supporting ongoing and future District website communications and media campaigns.

Pagosa Rooter will provide the plumbing services. They will be responsible for installing all toilets and urinals. Ferguson Enterprises of Durango will order, receive and deliver all of the replacement fixtures including showerheads, faucet aerators, waterless urinals and dual-flush toilets.

3. **Retail Water Deliveries for the Years 2004 through 2008**

PAWSD's total annual water delivery, including unaccounted for water, is presented in Table 3.

Table 3 - Summary of Water Deliveries by Customer Type 2004-2008 (in 1,000,000 gallons)

						Non-Revenue Water*					
Year	**Residential**	**Commercial**	**Irrigation**	**Town of Pagosa Springs**	**Fill Stations and WWTP**	**WTP and Other In-House Use**	**Other Non-Revenue**	**Total Treated Water Produced**	**% Other Non-Revenue Water**	**Non-Potable Water**	**Total Raw and Treated Water Produced**
2004	298.22	89.83	3.86	11.73	14.43	83.06	131.07	634.85	21%	122.62	757.47
2005	300.62	87.77	5.3	11.73	9.98	84.53	121.71	621.28	20%	108.97	730.25
2006	288.61	83.7	3.18	11.73	13.9	68	120.37	588.58	20%	82.64	671.22
2007	300.9	84.25	4.01	11.73	16.05	87.95	122.56	627.45	20%	89.5	716.95
2008	305.72	80.42	3.74	11.73	16.39	43.95	186.40**	648.35	28%	102.32	750.67

*Non-Revenue Water calculated using the AWWA Water Audit software and District Records.

**Other non-revenue water estimated for 2008 utilized data collected using different methods than employed in previous years, based in part on estimated water loss from known leaks that have since been repaired and improved customer usage data based upon year-round meter reading now available from the newly installed AMR equipment.

4. Does the District Qualify as a covered entity?

PAWSD is a covered entity.

5. Background Characterization of Water Sources and Potential Growth

(a) Current and Past years per capita water use

PAWSD serves about 7,200 single-family equivalent units (EUs) in and around the Pagosa Springs area providing water to about 75% of the population of Archuleta County. The District also provides water to a significant transient population of water and wastewater customers that utilize PAWSD services as they visit the area as tourists and/or property owners who reside in the community only on a part-time basis. For this reason, tracking per capita water use is challenging, and may not be a useful metric. To resolve the issue of transient population served, PAWSD tracks total water demand and equivalent units served. Table 4 provides a summary of the total water demand, equivalent units served and total demand per EUs for the years 1995 through 2008.

Table 4 – Total Water Use per Equivalent Units Served

	Equivalent Units (EUs) Served	Total Water Demand (mill gal)	Total Water Demand Per EU (gallons per day)
1995	3,593	542	413.61
1996	3,905	582	408.32
1997	4,215	586	381.10
1998	4,482	674	412.05
1999	4,761	648	372.84
2000	5,081	781	421.12
2001	5,373	749	381.68
2002	5,796	605	285.98
2003	6,002	652	297.62
2004	6,194	757	335.04
2005	6,412	730	312.02
2006	6,743	671	272.72
2007	7,083	717	277.32
2008	7,227	794	301.00

(b) Past, current and predicted population served by the District and the source of the information

Through the 1990s and into the 2000s, Archuleta County developed population estimates and growth projections in the PAWSD service area. The County's efforts were supported by the US Census Bureau and the Region 9 Economic Development Authority Survey of Second Homes in Archuleta County.

The Colorado State Demographer has also developed population estimates for Archuleta County, predicting a growth rate of about 3.5% per year over the period from

2000 to 2030, estimating that nearly 25,408 full time residents will call the County home in 2030.

Population estimates for PAWSD are presented in Table 5 based on observed past growth rates in the PAWSD service area (using EUs). Note that the population estimates include a very significant transient population of water and wastewater customers who utilize PAWSD services. This transient population includes tourists and/or property owners who reside in the community only on a part-time basis. PAWSD must include the transient population in its estimates since the District must be able to provide service during peak demand periods. Development is expected to continue in the PAWSD service area given the demand for part-time housing and condominiums, hotel rooms and full time residents. As residential demand increases, local commercial uses including hotels and restaurants, shops, and other commercial enterprises are also expected to increase. The total amount of outdoor watering may also increase over time.

Table 5 – PAWSD Service Population Estimates

	Total Equivalent Units (Eus)	Estimated Annual Population
2000	5,081	7,622
2005	6,412	9,618
2007	7,083	10,625
2010	7,802	11,821
2015	9,446	14,312
2020	11,438	17,330
2025	13,849	20,983
2030	16,769	25,408

Based on these estimates, the 2030 annual population served by PAWSD is estimated to be 25,408.

(c) Estimated water savings goals to be achieved through implementation of the proposed project

Water savings related to the implementation of the proposed commercial water audit program, and related fixture replacement efforts will stem from a combination of important and meaningful activities, including customer education and fixture replacement. The audits performed by GWI for PAWSD to date have indicated that the 5 audited businesses could save on average about 35% of their current indoor water use through fixture replacement. The range was expected to be from about 10 to 50% (which roughly agrees with savings reported by Vickers (2001)).

Excluding the leak found at the San Juan Motel (see Table 1), the replacement water cost related to the water savings is estimated to be about $120,000 for PAWSD and its customers. PAWSD's avoided costs to treat and pump and deliver potable water to these customers was estimated to be about $21,000 per year. Finally, the water and

energy savings for the businesses related to the water savings are estimated to range from $4,000 to $10,000 per year.

Based on these results of PAWSD's recent work, future water savings for 15 commercial audits and related retrofits is expected to be in the range of about **11.5 acre-feet** (using the average annual water use for the 50 biggest PAWSD water customers), or a little under 1 acre-foot per audit. **The replacement water value for this amount of saved water is about $230,000.**

The grant request from CWCB is $48,700, which reflects an average cost of about $4,235 per acre-foot of saved water. Overall, the project will cost $71,555, which reflects an average cost of about $6,222 per acre-foot of saved water, including the costs for outreach and education.

(d) Adequacy, Stability and Reliability of PAWSD Water Supply

Water Supplies:
The San Juan River Pipeline and Four Mile Creek, through the Dutton Ditch Pipeline, are the primary raw water sources for part of the District (District One). The District was issued a Special Use Permit from the U.S. Forest Service to construct a pipeline and eliminate the open ditch in 2005, which provided a stable method of water delivery during times of the District's priority water right. The other part of the District (District Two) derives its water from the West Fork of the San Juan River. When necessary, water can be transferred from one service area to the other.

Reservoirs:
To assure reliable water supplies, water is stored in reservoirs. PAWSD maintains and operates five reservoirs or lakes: Hatcher (798 acre feet usable capacity), Stevens (635 acre feet usable capacity), Pagosa (1,239 acre feet usable capacity), and Forest (268 acre feet usable capacity). Usable capacity for the fifth reservoir, Village, is not reflected primarily due to water quality issues, although in extreme conditions, this source could be utilized. In addition the surrounding golf courses, condominiums, time-shares, and a hotel utilize Village Lake for raw water irrigation. Hatcher Reservoir receives its primary source of water from Four Mile Creek through the Dutton Ditch Extension and through the Perkins Ditch. The Dutton Ditch diversion is capable of diverting water to Hatcher Reservoir, Stevens Reservoir, or both.

When Hatcher Reservoir is full, water is diverted to Stevens Reservoir from the Dutton Ditch Pipeline. When Stevens Reservoir is full it spills to Lake Pagosa through the Linn and Clark Ditch. When Lake Pagosa is full it spills into Village Lake. From there it spills into Lake Forest. Depending on various factors, including time of year and lake levels, PAWSD can and does pump raw water from the San Juan River through the San Juan Pipeline to Village Lake, Lake Forest, or both. For water received from the West Fork of the San Juan River, a smaller reservoir (approximately 14 acre feet usable capacity) is located adjacent to the Snowball Water Treatment Plant.

Water Treatment:
After water is collected, but before it can be used, it must first be treated at water treatment plants (WTP) to make it safe to drink and to remove unpleasant odors or tastes. PAWSD has three WTP that are operated as needed. District One currently has two facilities: Hatcher WTP and San Juan WTP. As their names imply, the Hatcher WTP (rated at 2 million gallons per day) treats water from Hatcher Reservoir. This facility has been upgraded and expanded to incorporate the use of ultraviolet disinfection and granular activated carbon towers to help reduce the levels of contaminants in the finished water. The San Juan WTP (rated at 3 million gallons per day) treats water from the San Juan River. In synchronization, the San Juan River and Trujillo Road Booster Pump Stations can deliver 3 million gallons of water per day to the San Juan WTP through a six-mile pipeline. District Two gravity feeds from the West Fork of the San Juan River to a sedimentation pond. The water then goes to the Snowball WTP (rated at 1.5 million gallons per day). All facilities are scheduled for continued improvements as a part of the District's 2055 capital improvement plan to keep pace with changing technologies and water quality regulations.

Treated Water Storage:
In District One, the Hatcher WTP pumps water to the Hatcher Storage Tank (500,000 gallon capacity). The Hatcher Storage Tank can also be filled via the Mission Booster Station. Water from the Hatcher and Stevens Storage Tanks supply water to the area generally divided at Putt Hill near Pike Drive.

When the San Juan WTP is in operation, it pumps water to the Stevens Storage Tank (1.5 million gallon capacity) and Meadows Storage Tank (1 million gallon capacity). In District Two, the Snowball WTP supplies water to the Snowball Storage Tank (250,000 gallon capacity), the Cemetery Storage Tank (1 million gallon capacity) and the Reservoir Hill Storage Tank (500,000 gallon capacity). Through a network of pipelines, the Snowball Storage Tank can supply water north and south of Town. Water from the Cemetery Storage Tank and the Reservoir Hill Storage Tank supplies water to Town and to Putt Hill One and Putt Hill Two Booster Stations, which pump water to the Putt Hill Storage Tank (150,000 gallon capacity). Water from the Putt Hill Storage Tank then gravity feeds to the Pagosa Hills area. Other smaller tanks are located at high points in the Eagle Peak, Reserve at Pagosa, Elk Park Ranches, and Loma Linda Subdivisions.

Wastewater Treatment Capacity:
After distribution system water (from areas within District One) has been used, it is collected and treated (or sanitized), and is then currently discharged to Martinez Creek. The PAWSD wastewater collection system is comprised of 27 sewer lift stations that pump to the main Vista Wastewater Treatment Plant. This treatment facility is able to treat 3.9 million gallons of wastewater per day. It should be noted, too, that there is also a Highlands Lagoon System that treats wastewater from the Hatcher area subdivisions.

Raw Water
The District provides raw water directly to a local golf course and HOAs for outdoor irrigation purposes. The District, which is obligated to provide up to 900 acre-feet of

raw water to these customers per year under an agreement, has averaged delivering 317 acre-feet per year under this agreement over the past six years.

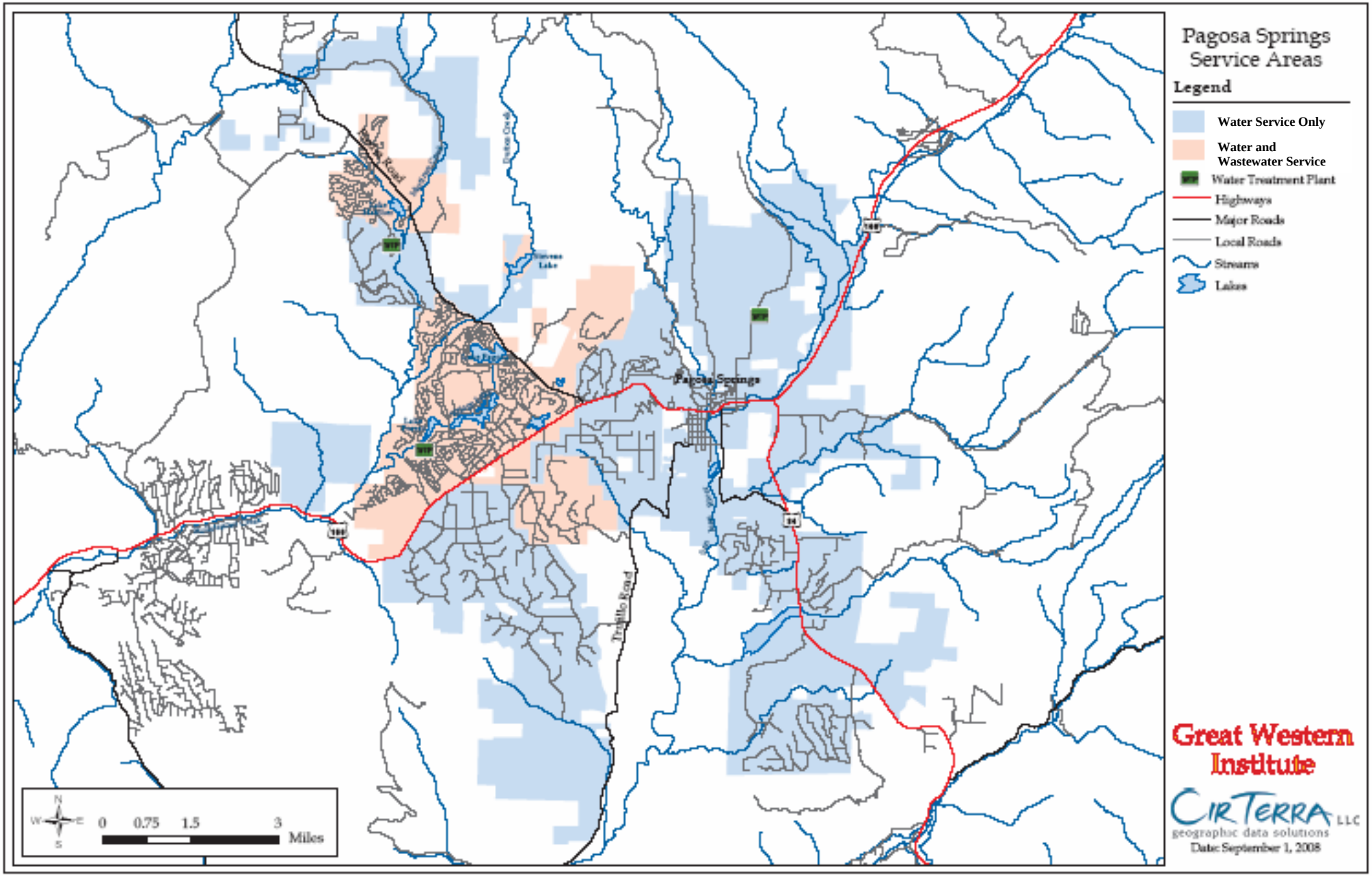
Summary
The District's water supply and treatment system is fully adequate to meet existing demands and provide a stable and reliable water source for PAWSD various customers. Due to the continued development of PAWSD service area and the continued needs of Town of Pagosa Springs and its many outlying developments, PAWSD will be required to provide infrastructure and water supplies to an ever increasing service population and related services. As water demands increase, PAWSD will utilize water conservation to help reduce total and seasonal water demand, for both its permanent and transient water user populations. The proposed commercial water audits and related fixture replacement project will provide some of the most cost effective water demand reductions identified by the District. PAWSD will also utilize improved metering and water accounting practices to reduce water loss and improve water use efficiencies. In this way, the District can improve water system reliability in the future as new sources of water supply are developed.

6. **Project scope and tasks** (see Attachment B)

7. **Project schedule** (see Attachment B)

8. **Project budget and funding breakdown** (see Attachment C)

Attachment A – Map of the PAWSD Service Area



Attachment B - Description of the Project Plan and Schedule

The District's recently approved Water Conservation Plan includes multiple measures and programs to support meaningful water savings. One of the most cost effective is expected to be its commercial water audit and fixture replacement program. The proposed project plan includes the commercial audits and the fixture replacements, plus an outreach task to help promote and explain the audits to the local community. The District will oversee and manage the development of the project with the assistance of Great Western Institute (GWI), and Chimera Inc.

The proposed scope of work, presented in detail below, involves four key sets of activities:

- Continuing implementation of the newly developed public outreach program to engage and educate the public regarding the proposed audit and fixture replacement program and create interest in the program from the local business community;
- Conducting audits at selected area businesses (i.e., those businesses that are high water users and/or have volunteered to be audited);
- Purchasing and installing high-efficiency fixtures (including showerheads, faucet aerators, waterless urinals and dual-flush toilets) at facilities that have or will be audited; and
- Reporting on the program successes and challenges.

The following is a list of specific tasks to be completed with project responsibilities, deliverables and project milestones.

Task 1 – Community Outreach

Purpose
The activities described under this task will provide messaging and information to the community as a whole and to commercial businesses regarding the commercial audit program.

Subtasks

1.1 Kick-off meeting and develop messaging strategies – plan for and conduct project kick-off meeting and plan for project specific outreach activities to support the commercial water audits and fixture replacement program.

1.2 Develop promotional materials – this task includes printing and production costs to develop window decals and stickers to promote local business compliance with the new water efficiency programs of the District.

1.3 Develop Project Planet materials – coordinate with Project Planet to obtain motel in-room educational materials for local businesses.

1.4 Conduct community outreach activities – this task includes developing and circulating public service announcements (PSA) to the newspaper and local radio stations; and attending local water and other community fairs.

Task Responsibilities

District
The District will provide resources to the project team related to the Catch the Wave messaging program. The District will provide support with the community outreach efforts including distribution of messaging to various media channels. The District will pay for the printing and provide their time as in-kind to match the CWCB funds.

GWI/Chimera
Update and expand the Catch the Wave website; produce and distribute promotional and educational packages to businesses; and support all community outreach efforts, as needed.

Task Deliverables
Update of the web site; production of promotional materials, and newspaper and radio PSAs.

Task 2 – Conduct Commercial Audits and Replace Inefficient Fixtures

Purpose
The activities described under this task will include selecting and visiting commercial businesses, conducting the audits, installing high efficiency fixtures and measuring pre- and post-audit water usage. Note that fixture replacement will only occur in those facilities which have been audited previously (2 motels and 3 restaurants) or will be audited during this project (5 motels and 5 restaurants).

Subtasks

2.1 Obtain and review water use data – Review past and current water use data for commercial restaurants and motels including monthly and annual water use. Select candidate commercial customers for the water audits based on type of business (we will prioritize audits for motels and restaurants in this tourism dependant community), high water bills and total water use, large off-season water use (which may indicate a leak), and customer willingness to participate in the program.

2.2 Contact commercial water customers and schedule site visits – contact candidate commercial water users and schedule audits.

2.3 Order high efficiency water fixtures – Prior to the site visits, showerheads, pre-rinse nozzles and faucet aerators will be ordered, as will those high efficiency toilets and urinals that have been identified for installation at the 2 motels and 3 restaurants that were audited during the demonstration audit project conducted in the first quarter of 2009. Faucet aerators and showerheads for the other 5 motels and 5 restaurants will also be ordered such that they can be installed during the site audit. These fixtures

will be shipped to the Pagosa Springs area and stored safely until the site visits occur. The number of fixtures ordered at first will be a subset of those listed in the table below (i.e., 394 faucet aerators, 312 showerheads, 7 urinals and 13 dual-flush toilets). The balance of the replacement fixtures will be ordered as needed, depending on the timing and results of the audits.

2.4 Conduct site visits – conduct site visits to inventory types of water use and equipment, and identify areas of potential water savings including those data and information described in the grant application narrative. To the extent practical, showerheads, faucet aerators and pre-rinse nozzles will be installed during the site visits.

2.5 Develop water model - Water models will be developed for each facility that is audited to help characterize both indoor and outdoor water use. Each and every indoor and outdoor water using fixture and use will be incorporated into the facility specific water model to help identify water use trends and areas of potential water savings. Outdoor irrigation practices will be reviewed, including estimates of outdoor water use and demand (based on seasonal water use records, irrigated acreage and irrigation practices), to determine if irrigation practices are consistent with the needs of the landscape. The water models will be calibrated to average and maximum monthly water use. Once the water model has been developed and calibrated, it will be used to estimate potential water and energy savings associated with a suite of fixture replacements and improvements in water use efficiency.

2.6 Replace fixtures – Replacing fixtures will occur in those facilities that have already been audited (2 motels and 3 restaurants) and during the site audits (for the small fixtures) and afterward for the larger fixtures (especially the high-efficiency toilets and urinals). Large fixture replacement will occur only after the facility audits have taken place.

2.7 Follow-up to site visits – once the site visits and fixture replacements have occurred, each business owner will be presented with a brief report detailing the findings of the audit, providing the owner with an inventory of the water use and the water and related energy savings that will be realized with those fixtures installed as a result of this program. The business owner will also be provided with a cost-benefit analysis of other fixtures replacements and changes in water use behavior that they may choose to implement. Educational information will also be provided at this time.

Task Responsibilities

District
Work with GWI to schedule and conduct the audits, and support the installation of high-efficiency fixtures by coordinating the ordering and delivery of the fixtures. The District will also support the follow-up meetings with the commercial entities involved in the project. The District will pay for the plumber and provide their time as in-kind to match the CWCB funds.

GWI/Chimera

Analyze data and develop applicable worksheets. Schedule and conduct site visits and when applicable and appropriate install high-efficiency fixtures. Develop and complete all water use analyses using spreadsheet based water models. Compile audit reports. Coordinate purchase and shipping of the fixtures, and coordinate plumber to install toilets and urinals. Conduct customer follow-up.

Pagosa Rooter/Ferguson Enterprises
Order, store and deliver all fixtures. Install all urinals and toilets as per manufacturer requirements.

Note that costs currently have been included to replace all of the faucet aerators and showerheads expected to be found in 7 motels, and all appropriate kitchen (those used for hand washing rather than pots and pans) and bath faucet aerators, and toilets and urinals found in 8 restaurants. PAWSD will also install pre-rinse spray nozzles in those audited facilities that do not currently have them. A summary is provided below.

Fixture type	Number of Fixture Replacements Included in Budget
Motel	
1.5 gpm Showerheads	313
0.5 gpm Faucet Aerators	312
Restaurants	
0.5 gpm Kitchen Handwash Sink Faucet Aerators	16
0.5 gpm Bath Faucet Aerators	65
1.28/0.9 gpf HE Dual-Flush Toilets*	33
Waterless Urinals	19
Pre-Rinse Spray Nozzle	(PAWSD has these in stock)

gpm – gallon per minute; gpf – gallon per flush
* includes handicapped accessible and regular height toilets

Task Deliverables
Prepare section of the Draft Report related to conducting the audits, performing the water use analyses, identifying water savings opportunities, and related appendices.

Task 3 – Reporting

Purpose
The activities described under this task will be used to develop and complete all project reporting.

Subtasks

3.1 Conduct data review and analysis – collect data regarding post-audit water use and develop analysis on water use reduction, cost of water savings and cost-benefit for additional water savings for each individual customer. Water use reductions will be developed by comparing past and current monthly water use for each facility that receives fixture replacements. Water use reductions observed will be compared to the predicted water use reductions developed using the water model prepared for

each audited facility. Water use reductions and related analyses will be conducted using observed data over a period of not less than 8 months after the fixtures have been replaced. Note that to date, none of the audited facilities have had any outdoor irrigation beyond handwatering of a few planters. Therefore, the month to month comparison of water use for these facilities will not need to include an accounting for variable outdoor irrigation demands. It is anticipated that the majority, if not all, of the commercial entities that will be audited under this project will also lack outdoor irrigation demands.

3.2 Prepare Draft Report - compile information, data and other content into Draft Report for review and comment. Produce three (3) hardcopies and one electronic copy for District review.

3.3 Prepare Final Report – finalize the report based on comments received from the District and District Board and produce.

3.4 Board presentations – provide the Board with an update during project execution and an overview of the findings after the Draft Report has been prepared and reviewed by the District.

3.5 Prepare and complete progress reports – prepare progress reports as per CWCB requirements including discussion of project status, project successes and obstacles, and potential budget and schedule impacts. Prepare monthly project status reports for District including costs incurred, tasks completed and project needs, as appropriate.

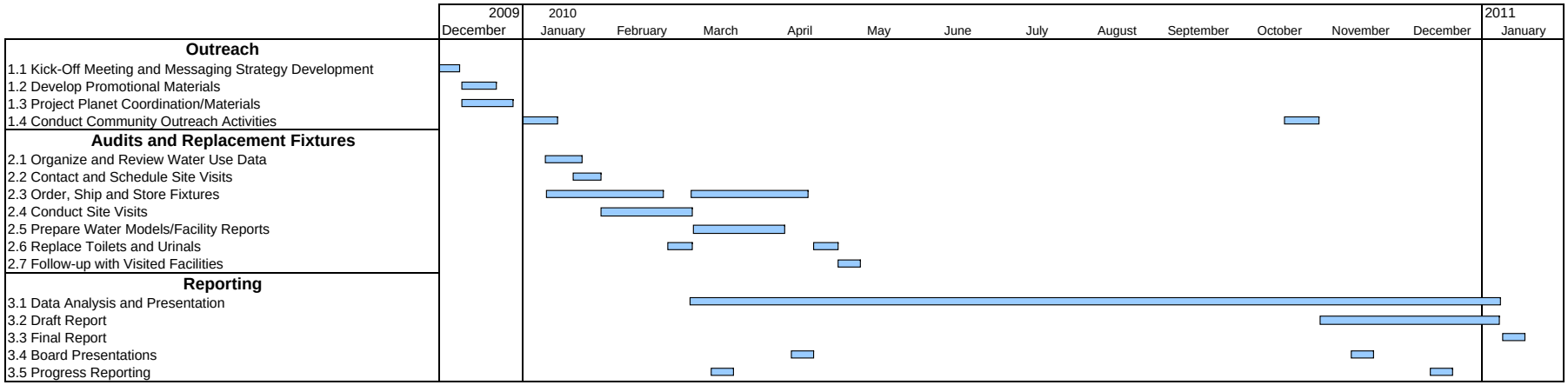
Task Responsibilities

District
Assemble data and other information needed for subtask completion. Review draft work products and provide feedback to GWI. Coordinate Board presentations. Prepare and submit progress reports to CWCB. The District will provide their time as in-kind to match the CWCB funds

GWI/Chimera
Make data requests to the District and locate additional data as needed. Review and provide feedback to the District on the quality and accuracy of data. Analyze data and develop text tables, figures, and applicable worksheets. Prepare and submit monthly progress reports and invoices to the District. Prepare and finalize Project Reports.

Task Deliverables
- Monthly invoices and progress reports for the District.
- 50% and 95% project progress reports for the CWCB.
- Draft and Final Project Reports

Proposed Project Schedule
PAWSD Commercial Audit and Fixture Replacement Project



Project Budget Estimate
Commercial Water Audits and Retrofits
PAWSD

	Labor Budget																Expenses	
	GWI - TCB			Chimera - NB			Plumbing Support			PAWSD - ST			PAWSD - SB			PAWSD - MdeG		
	rate ($/hr)	$	95.00	rate ($/hr)	$	100.00	Lump Sum	$	120.00	rate ($/hr)	$	65.00	rate ($/hr)	$	45.00	rate ($/hr)	$	45.00		
	hrs		$	hrs		$	no.		$	hrs		$	hrs		$	hrs		$	number	$
Outreach																				
1.1 Kick-Off Meeting and Messaging Strategy Development	2	$	190.00	2	$	200.00	-	$	-	4	$	260.00	6	$	270.00	4	$	180.00	-	$ -
1.2 Develop Promotional Materials	-	$	-	1	$	100.00	-	$	-	-	$	-	1	$	45.00	4	$	180.00	100	$ 150
1.3 Project Planet Coordination/Materials	1	$	95.00	2	$	200.00	-	$	-	-	$	-	1	$	45.00	4	$	180.00	10	$ 3,470
1.4 Conduct Community Outreach Activities	2	$	190.00	4	$	400.00	-	$	-	2	$	130.00	8	$	360.00	8	$	360.00	-	$ -
	5	$	475.00	9	$	900.00	-	$	-	6	$	390.00	16	$	720.00	20	$	900.00		$ 3,620
					$	1,375.00											$	2,010.00		
Audits and Replacement Fixtures																				
2.1 Organize and review water use data	12	$	1,140.00	-	$	-	-	$	-	2	$	130.00	-	$	-	12	$	540.00	-	$ -
2.2 Contact and schedule site visits	2	$	190.00	-	$	-	-	$	-	-	$	-	-	$	-	18	$	810.00	-	$ -
2.3 Order, Ship and Store Fixtures	4	$	380.00	-	$	-	-	$	-	-	$	-	-	$	-	6	$	270.00	-	$ -
2.4 Conduct Site Visits	45	$	4,275.00	-	$	-	-	$	-	-	$	-	4	$	180.00	45	$	2,025.00	15	$ 533
2.5 Prepare Water Models/Facility Reports	50	$	4,750.00	-	$	-	-	$	-	-	$	-	-	$	-	6	$	270.00	-	$ -
2.6 Replace fixtures																				
toilets	2	$	190.00	-	$	-	33	$	3,960.00	-	$	-	-	$	-	4	$	180.00	33	$ 6,630
urinals	2	$	190.00	-	$	-	19	$	2,280.00	-	$	-	-	$	-	4	$	180.00	19	$ 6,220
restaurant bath and kitchen handwash faucet aerators	2	$	190.00	-	$	-	-	$	-	-	$	-	-	$	-	4	$	180.00	81	$ 130
showerheads	2	$	190.00	-	$	-	-	$	-	-	$	-	-	$	-	4	$	180.00	312	$ 9,837
motel bathroom faucet aerators	2	$	190.00	-	$	-	-	$	-	-	$	-	-	$	-	4	$	180.00	313	$ 504
2.7 Follow-up with visited sites	20	$	1,900.00	4	$	400.00	-	$	-	-	$	-	4	$	180.00	4	$	180.00	-	$ -
	143	$	13,585.00	4	$	400.00	52	$	6,240.00	2	$	130.00	8	$	360.00	111	$	4,995.00		$ 23,855
					$	13,985.00											$	5,485.00		
Reporting																				
3.1 Data Analysis and Presentation	45	$	4,275.00	-	$	-	-	$	-	4	$	260.00	-	$	-	60	$	2,700.00	-	$ -
3.2 Draft Report	24	$	2,280.00	4	$	400.00	-	$	-	4	$	260.00	4	$	180.00	12	$	540.00	5	$ 250
3.3 Final Report	4	$	380.00	-	$	-	-	$	-	2	$	130.00	2	$	90.00	4	$	180.00	5	$ 250
3.4 Board Presentations	8	$	760.00	4	$	400.00	-	$	-	2	$	130.00	4	$	180.00	8	$	360.00	1	$ 300
3.5 Progress Reporting	2	$	190.00	-	$	-	-	$	-	2	$	130.00	4	$	180.00	4	$	180.00	-	$ -
	83	$	7,885.00	8	$	800.00	-	$	-	14	$	910.00	14	$	630.00	88	$	3,960.00		$ 800
					$	8,685.00		$	6,240.00								$	5,500.00		
Sub-Totals					**$**	**24,045.00**		**$**	**6,240.00**								**$**	**12,995.00**		**$ 28,275.00**

Total PAWSD Contribution			**$ 22,855.00**
in-kind	labor	$	12,995.00
cash	printing	$	3,620.00
cash	plumber	$	6,240.00
Total CWCB Grant			**$ 48,700.00**
project $	labor	$	24,045.00
	expenses	$	24,655.00
Total Project			**$ 71,555.00**
% match			31.9%

11/6/2009