

# CITIZENS' WATER ADVISORY COMMITTEE (CWAC)



Wednesday, January 7, 2015, 7:00 a.m.  
Director's Conference Room  
Tucson Water, 3<sup>rd</sup> Floor  
310 W. Alameda Street, Tucson, Arizona

## \*Revised Legal Action Report

### 1. Roll Call:

The meeting was called to order by CWAC Chair, Brian Wong at 7:02 a.m. Those present and absent were:

#### Present:

Brian Wong	Chairperson, Representative, City Manager
Mark Murphy	Representative, Mayor
Jean McLain	Representative, City Manager
Catlow Shipek	Representative, City Manager
Mitch Basefsky	Representative, City Manager
Placido dos Santos	Representative, City Manager
Chuck Freitas	Representative, City Manager
<b>*Mark Taylor</b>	<b>Representative, City Manager</b>
Alan Tonelson	Representative, Ward 1
Bruce Billings	Representative, Ward 3
<b>*Mark Lewis</b>	<b>Vice Chair, Representative, Ward 5</b>
Kelly Lee	Representative, Ward 6 (arrived 7:18 a.m.)
Alan Forrest	Tucson Water, Director, Ex-Officio Member
Jackson Jenkins	Pima County Regional Wastewater Reclamation Department Director, Ex-Officio Member

#### Absent:

Amy McCoy	Representative, Ward 2
George White	Representative, Ward 4

#### Tucson Water Staff Present:

Sandy Elder	Deputy Director
Jeff Biggs	Interim Deputy Director
Andrew Greenhill	Intergovernmental Affairs Manager
Chris Rodriguez	Water Administrator
Pat Eisenberg	Water Administrator
Melodee Loyer	Water Administrator
Belinda Oden	Water Administrator
Britt Klein	Water Administrator
Fernando Molina	Water Program Supervisor
Daniel Ransom	Water Conservation Supervisor
Cheryl Avila	Water Operations Superintendent
Shane Oman	Finance Manager
Candace Rupprecht	Public Information Specialist
Johanna Hernandez	Staff Assistant
Kris LaFleur	Staff Assistant

#### Others Present:

Chris Avery	City of Tucson, Attorney's Office
Tony Wong	City of Tucson, Budget
Katie Bolger	City of Tucson, Ward 2
Amy Stabler	City of Tucson, Ward 6
Deb Galardi	Galardi and Rothstein
Julie Brugger	UA Research Scientist
Ted Cooke	CAWCD
Dick Gelpke	Citizen

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2. **Announcements** – Member Tonelson wished the CWAC a belated Happy Holidays. Member Lewis noted that he will be attending a session at Tucson Water to further his knowledge of the AMR/AMI system, and invites others to attend as well. Member McClain announced a presentation by Chuck Graf regarding Reclaimed Water, scheduled for January 8, 2015. Chairperson Wong addressed the Committee regarding general CWAC business. Chairperson Wong requested that members hold their questions on presentations until presenters are done. Additionally, Chairperson Wong reminds the Committee of their charge as an advisory committee to the Mayor and Council.
3. **Call to Audience** – No action taken.
4. **Review of December 3, 2014 Legal Action Report and Meeting Minutes** – Committee Member Freitas motioned to approve the Meeting Minutes of December 3, 2014. Member Tonelson seconded. Motion passed unanimously by a voice vote of 11-0.
5. **Director's Report** –
  - a. **Mayor and Council Items** – On January 21<sup>st</sup> Mayor and Council will consider the approval of the transfer of 19 acre feet per year of CAP allocation from Flowing Wells to Tucson Water.
  - b. **Department Updates** – Tucson Water currently has 52 vacancies, 15 active recruitments and 4 pending new hires.
  - c. **Informational Items** – Director Forrest informed the Committee that the transfer of Sunset Ranch to Marana was completed on December 30, 2014.

Calendar year water production is down 3.6% from this time last year. Director Forrest noted that December 25, 2014 was the minimum demand day for calendar year 2015 at 57.4 MGD. This day reflected the lowest daily demand since January 1, 1995. Other record lows for calendar year 2014 were provided. Brief discussion was held. Member Tonelson questioned the water use of the Fire Department during quarterly drills, Tucson Water staff will follow-up with CWAC members when more specific information on this issue is available.

Director Forrest reported on the closure of the Randolph Park wastewater treatment plant, effective December 30, 2014. Tucson Water and Pima County are working on an amendment to the IGA related to the Randolph Park closure.

Brief discussion held on the progress of the AMR/AMI program in response to member questions.

## 6. **Subcommittee Reports** –

**Technical, Policy, and Planning Subcommittee** – Subcommittee Chair Murphy noted that TPP received a presentation regarding the continuation of the CAWCD \$.04 tax. Subcommittee Chair Murphy conveyed that TPP voted to recommend that CWAC formally support the continuation of the tax, and presented a draft memorandum of support for CWAC's consideration. Discussion began with Member Lewis' questions regarding how much of the tax is used to repay the original debt, as well as changes to the legislation. Ted Cooke, representative of CAWCD, responded to Member Lewis' questions. Member Lewis clarified that by approval of the letter of support, CWAC is supporting the extension of the legislation as it is now, and any further modifications to the legislation would not be included in the approval of this draft letter of support. Member Freitas and Mr. Cooke clarified that there are no other changes proposed to the current legislation than extending the expiration date to 2045. Director Forrest noted that there are other uses of the \$.04 tax, specifically the Water Bank, that benefit Tucson Water rate payers, and the Tucson Active Management Area as a whole, that ought to be considered as well.

Member Lewis motioned for approval of the draft memorandum with an added clarification on the uses of the tax, as well as correction of any typographical errors. Motion seconded by Member Tonelson. Members dos Santos and Basefsky recused themselves for the record. Motion passed by a voice vote of 10-0 with 2 stated abstentions. A corrected memorandum will be disseminated to the Committee as soon as it is available.

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**Finance Subcommittee** – Subcommittee Chair Billings informed the Committee that the Subcommittee has been focused on the Financial Plan, which will come before this Committee for a vote at this meeting. The Subcommittee will be working on Cost of Service next.

**Conservation and Education Subcommittee** – In Subcommittee Chair Amy McCoy's absence Member Shippek noted the Subcommittee has been focused on Rain Water Harvesting, the Conservation Annual Plan, the Conservation Fee, drafting a Strategic Plan and upcoming Conservation programs.

**RWRAC Update** – Member Taylor noted that the focus of current meetings has been the financial process. The Committee is considering a small increase in rates over 3 years. Other issues discussed include the shut-down of Randolph Park, the biogas contract and updates on the fee study.

**Formation/Selection of Ad Hoc Subcommittee for update of CWAC Rules and Regulations** – Tucson Water staff member Johanna Hernandez informed the Committee that the CWAC Rules and Regulations need to be updated. Boards and Commissions strongly recommends the formation of an Ad Hoc Subcommittee to develop these rules in coordination with a Boards and Commissions attorney present to advise on compliance with code. Member Lewis motioned for formation of an Ad Hoc Subcommittee. Motion seconded by Member Freitas. Motion passed unanimously by a roll-call vote of 12-0. Members Freitas, Lewis, and Murphy self-nominated for membership of the Ad Hoc Subcommittee. Member Murphy nominated Member Lewis for Chair, Member Lewis accepted. Member Murphy motioned to approve nominations for membership and chair. Motion seconded by Member Freitas. Motion passed unanimously by a roll-call vote of 12-0. Director Forrest clarified that formation of the rules will be done in conjunction with a City attorney specializing in Boards and Commissions.

7. **Conservation Annual Report** – Tucson Water staff member Fernando Molina introduced the Conservation Annual Report and acknowledged the efforts of Conservation staff in development of this years expanded report. Tucson Water staff member Daniel Ransom briefly summarized the Conservation Annual Report. The major differences from prior reports were noted and minor clarifications were made. Brief discussion on the Report and the conservation program was held. Member Tonelson motioned for approval of the Conservation Annual Report. Motion seconded by Member Taylor. Member Lewis motioned for a first amendment to the original motion reflecting that staff recommendations are still in discussion by the Conservation and Education Subcommittee, and that final rebates and Fiscal Year 2016 recommendations will be processed through the Subcommittee and the full Committee. Motion seconded by member Freitas. Member Murphy clarified that this amendment does not require any modifications to the report, but rather is a clarification for the record. First amendment to the motion passed unanimously by a voice vote of 12-0. Member Lewis motioned for a second amendment to the original motion directing staff to include validated financial data, establish and track metrics, track programs by 10 identified regions, and prepare an amended Conservation Annual Report format to the Committee for consideration no later than May 2015 for future use upon approval. Motion for second amendment did not receive a second and dies. Original motion, including first amendment, passed unanimously by a voice vote of 12-0.
8. **Tucson Water Financial Plan** – Tucson Water staff member Belinda Oden, along with rate consultant Deb Galardi, presented the proposed Fiscal Year 2015-2020 Financial Plan. Ms. Oden spoke to a few typographical errors in the packet provided to the members. Corrected pages were provided. Tucson Water reliability was briefly discussed, followed by a breakdown of the rate process. Tucson Water is currently in step one of the rate process, Development of the Financial Plan. Mayor and Council policies regarding debt service coverage, cash reserves and annual review of rates and charges were all reviewed. Bond covenants and rating agencies were briefly discussed. The Operating and Maintenance as well as the Capital budgets, both previously presented to the Committee, were briefly reviewed. The Committee was presented with two Financial Plans for consideration: Option 1, which includes an in lieu fee, and Option 2, which does not include an in lieu fee. Ms. Galardi discussed the revenue forecast. The forecast has been generally consistent with predictions. This year's forecast is slightly more conservative based on water use. Adoption of Option 1 results in a reduction of the previously recommended rate increase of 8.3% to 7.3%. Adoption of Option 2 results in a reduction of the previously recommended rate increase of 8.3% to 7.1%. A comparison of the prior year's annual revenue requirements from rates and the current year's annual revenue requirements from rates was discussed. New revenues will be used to reduce the rate increase as well as to increase performance targets. Ms.

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Oden covered the next steps in the rate process, including Mayor and Council consideration of the Financial Plan, review of Cost of Service and Rate Schedules, and Mayor and Council consideration of proposed rates.

Member Billings conveyed the Finance Subcommittee's recommendation that both plans be moved to Mayor and Council with a preference for Option 2, which does not include an in lieu fee.

Member Freitas motioned for approval of the Financial Plan for FY 2015-2020 with two plan options, Option 1 with an in lieu fee, and Option 2 without an in lieu fee, reflecting, upon clarification, a preference for Option 2, without an in lieu fee. Motion seconded by Member Billings. Extensive discussion was held. Member Lewis moved to substitute the original motion with an identical motion removing any preference for either plan, seconded by Member Murphy. Further extensive discussion regarding the in lieu fee ensued. Various alternatives for recommendation of a preference for one of the Options were discussed by the Committee. Substitute motion to forward both financial plans without recommendation failed by a roll-call vote of 4-8, with Members Taylor, Wong, Freitas, Shipek, Tonelson, Lee, Basefsky, and dos Santos dissenting. Original motion to forward both plans with a preference for Option 2 passed by a roll-call vote of 11-1, with Member McClain dissenting.

Ms. Oden addressed the proposed Conservation Fee increase from \$.07 to \$.08 for the development and expansion of the Conservation Program. This increase is one year ahead of previous projections. Member Lewis motioned for adoption of the Conservation Fee increase. Motion seconded by Member dos Santos. Discussion ensued. Motion passed unanimously by a voice vote of 12-0.

9. **Future Meetings/Agenda Items** – A tour of CAP facilities will be scheduled outside of a regularly scheduled meeting. See projected agenda.
10. **Adjournment** – Meeting was adjourned at 9:01 a.m.

**DATE:** January 7, 2015

**TO:** Honorable Mayor and  
Council Members

**FROM:** Brian Wong  
Chair, CWAC

**SUBJECT:** Recommendation of Support for Central Arizona Water Conservation  
District's Four Cent Tax Extension

This memorandum is in response to the Central Arizona Water Conservation District (CAWCD) Board of Director's request for support of a legislative extension of the 4-Cent, *Ad-Valorem* Water Storage Tax (A.R.S. §48-3715.02) through 2045.

The City of Tucson, Citizens' Water Advisory Committee (CWAC) recommends that Mayor and Council formally support this extension by the Arizona State Legislature in the 2015 Session. The reason for this action is the unqualified benefits of the tax to the Tucson Water customers.

CAWCD has relied upon this revenue since 1990, and, from 1994 through today, for repayment of the federal obligations of the Central Arizona Project (CAP). Without the Water Storage Tax, this revenue would come directly from the CAP customers and, by extension, Tucson Water rate payers. Singling out the people of Tucson and other CAP users for the revenue shortfall would be a gross inequity. Studies conducted by W. P. Carey School of Business, Arizona State University, demonstrate that the *entire* State of Arizona benefits from the CAP and its water, generating 1.6 million jobs and 1.09 trillion dollars of gross state product over the life of the project. For this large return, the district homeowner invests only about \$8 per year on a \$200,000 house. The CAP is clearly an outstanding bargain.

With an uncertain water supply future before us, the entire State of Arizona is well served by this irreplaceable resource and the CWAC strongly endorses the extension of the Water Storage Tax. We advise that Mayor and Council recommend our State Legislature to approve the extension through 2045.

cc: Martha Durkin, Interim City Manager  
Albert Elias, Assistant City Manager  
Alan D. Forrest, P.E., Director, Tucson Water  
Roger Randolph, City Clerk  
CWAC

**\*Draft does not reflect approved amendments**



# Water Conservation Program FY 2013-14 Annual Report



November 2014

*City of Tucson*

Jonathan Rothschild, Mayor

Martha Durkin, Interim City Manager

*City Councilors*

Regina Romero, Ward One

Paul Cunningham, Ward Two

Karin Uhlich, Ward Three

Shirley Scott, Ward Four

Richard Fimbres, Ward Five

Steve Kozachik, Ward Six

*Compiled, written, and edited by:*

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Candice Rupprecht, Tucson Water

*Acknowledgments*

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## Conservation Snapshot of Fiscal Year 2013-2014

Water demand has continued to decline in the last few years with a record low gallon per capita per day (GPCD) of 127 and a residential GPCD of 88 in 2013. The conservation fee, now in its sixth year, has provided significant opportunity for Tucson Water and our customers to receive high-quality conservation programs and invest in robust efficiency incentives.

In FY 2013-2014, the conservation fee has resulted in:

- 70,549,943 gallons (217 acre-feet) conserved
- \$1,505,020 invested in rebates and incentives
- 8,756 high-efficiency toilet (HET) and urinal installations
- 290 irrigation efficiency, rainwater harvesting, and gray water applications

To date, the conservation fee has resulted in:

- 600,863,362 gallons (1,844 acre-feet) conserved
- More than four million dollars invested in rebates and incentives
- 28,443 HET and urinal installations
- 720 irrigation efficiency, rainwater harvesting, and gray water applications

In FY 2013-2014 our partner programs provided:

- 85 technical workshops for 2,023 local professionals
- 31,866 students with water resources instruction
- 354 teachers with professional development
- 4,463 adults with direction instruction
- Nearly 1.5 million gallons of water savings

### Recommendations for 2015 include:

- Streamline and create more equitable high-efficiency toilet rebate programs by setting two rebate prices. \$75 for gravity-tank type and pressure assist-tank type toilets and \$150 for flushometer-valve type toilets (flushometer-valve types only for commercial sector).
- Reduce high-efficiency urinal rebates back to \$200 to be consistent with commercial HET rebate and evaluate progress next year.
- Gray water and rainwater harvesting rebates will continue to be evaluated for water savings and customer equity.
- Offer a new high-efficiency washing machine rebate of \$100, available to residential, multi-family, and commercial customers.
- Offer a new, customized commercial rebate that will calculate a customer rebate amount based on potential water savings determined from a facility water audit.

## Introduction

This report describes the activities of the Tucson Water Conservation Program for July 1, 2013, through June 30, 2014. The program is funded through a water conservation fee currently set at seven cents per hundred cubic feet (Ccf). The fee is assessed to all potable water users. *(Table 1 illustrates funds raised and the expenditures since the inception of the Water Conservation Program Fee in FY 2008-09 that provided funding for an expanded conservation incentives program)* Roll over funds are budgeted to maintain the current fee until the end of FY 2016-17 as established in the five-year Financial Plan. In FY 2017-18, the fee is scheduled to increase to eight cents per Ccf and in FY 2018-19 to nine cents per Ccf.

*(See Appendix A for the Five-Year Financial Plan)*

The Conservation and Education Subcommittee of the Citizens’ Water Advisory Council (CWAC) is charged with overseeing the Water Conservation Fund and works with staff to develop and evaluate programs. Tucson Water is responsible to the ratepayers to provide cost-effective programs that save water and reduce demand. Each month, CWAC and Mayor and Council receive a detailed report showing activities, expenditures, and estimated water saved for the water conservation program.

*(See Appendix B for the Efficiency Program Implementation FY 2013-14 Report)*

	FY 08/09	FY 09/10	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15
<b>Cons. Fee</b>	\$0.03	\$0.04	\$0.05	\$0.07	\$0.07	\$0.07	\$0.07
<b>Budget</b>	\$997,000	\$997,000	\$1,086,690	\$2,902,630	\$3,356,820	\$2,950,000	\$3,050,000
<b>Revenue</b>	\$1,217,280	\$1,716,880	\$2,124,838	\$2,816,241	\$2,830,967	\$2,832,950	
<b>Expenditure</b>	\$794,462	\$831,883	\$1,720,075	\$1,495,082	\$2,727,541	\$2,966,943	

Table 1: Water Conservation Program Budget Overview

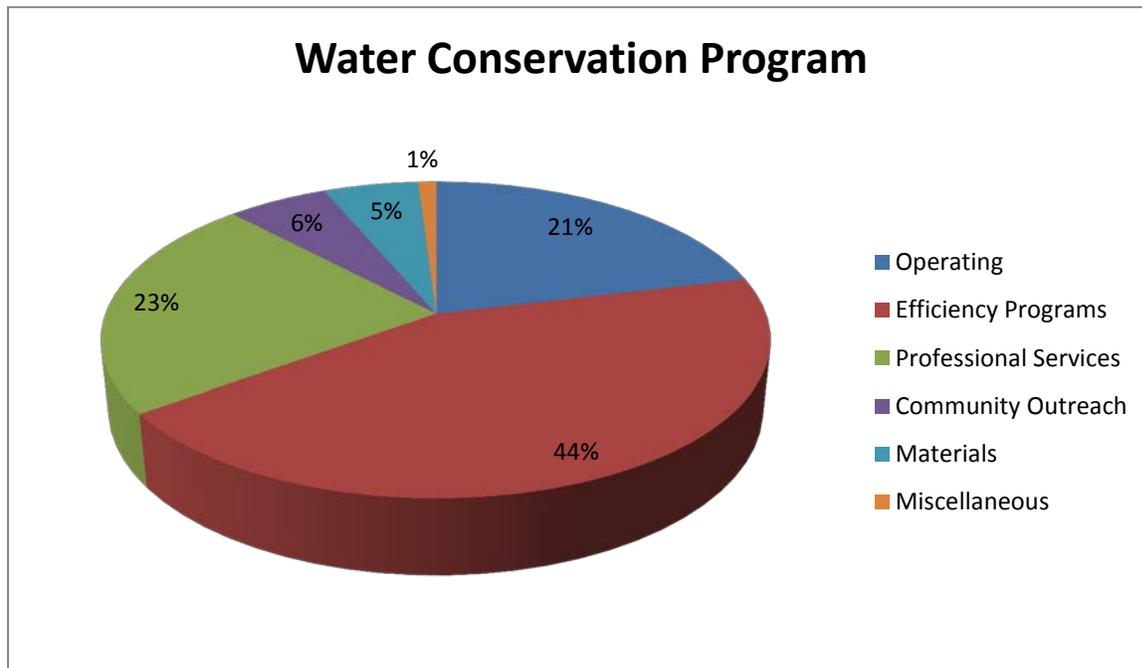


Figure 1: Water Conservation Program Expenditures by Percentage

The water conservation program fund can be broken down into six main categories as shown in Figure 1:

- Operating – salaries and wages for permanent employees
  - 1 Supervisor
  - 2 Water Conservation Specialists
  - 2 Utility Service Representatives
  - 1 Administrative Assistant (part time)
  - Zanjero Program (\$220,000)<sup>1</sup>
- Efficiency Programs – incentive and rebate programs designed to provide long-term measurable reductions in water use (rebate expenditures only)
- Professional Services – contractors that support the conservation program in implementation of youth education and toilet replacement programs (Project WET, EEExchange, SmartScape, and CHRPA)
- Community Outreach – public relations and advertising
- Materials – information materials to promote programs and support behavioral change with low-income HET materials, shower heads, shower timers, aerators, signage, promotional materials, etc.
- Other Miscellaneous – travel, training, printing and reproduction, computers, etc.

Tucson Water has a long history of planning and developing water supplies for today and into the future. This has been accomplished by increasing the use of renewable Colorado River Water, using recycled water (known as reclaimed water) for irrigation purposes, and supporting one of the longest running conservation programs in the nation. As a result, Tucsonans are now using water at the same level of use as in 1989, while population has increased by 200,000 and service connections have increased by 75,250. This fact alone is a strong indicator that water is being used much more efficiently than ever.

A common metric for comparing annual water use and water conservation effectiveness is GPCD, which is derived by dividing the number of people served by the amount of water produced. *(Table 2 illustrates the reduction in GPCD compared to a rise in population for the last four years, and Figure 2 shows total and residential GPCD since 2000.)* Long Range Water Plan projections indicate that there is enough water available today to meet demands through 2050, even if reductions in deliveries of CAP water occur. The report, 2012 update, Water Plan: 2000-2050, is available on the City’s website at: [water.tucsonaz.gov/files/water/docs/2012\\_Update\\_Water\\_Plan\\_2000-2050.pdf](http://water.tucsonaz.gov/files/water/docs/2012_Update_Water_Plan_2000-2050.pdf).

	<b>Population</b>	<b>Total GPCD</b>	<b>Residential GPCD<sup>2</sup></b>
<b>2010</b>	705,817	139	94
<b>2011</b>	706,118	136	91
<b>2012</b>	708,863	131	89
<b>2013</b>	712,698	127	88

Table 2: Gallons per Capita per Day (GPCD)

<sup>1</sup> The Zanjero program was supplemented FY 2012-13 and FY 2013-14 for \$220,000 and will not be included in future budgets.

<sup>2</sup> The residential GPCD does not include Multi-Family water use

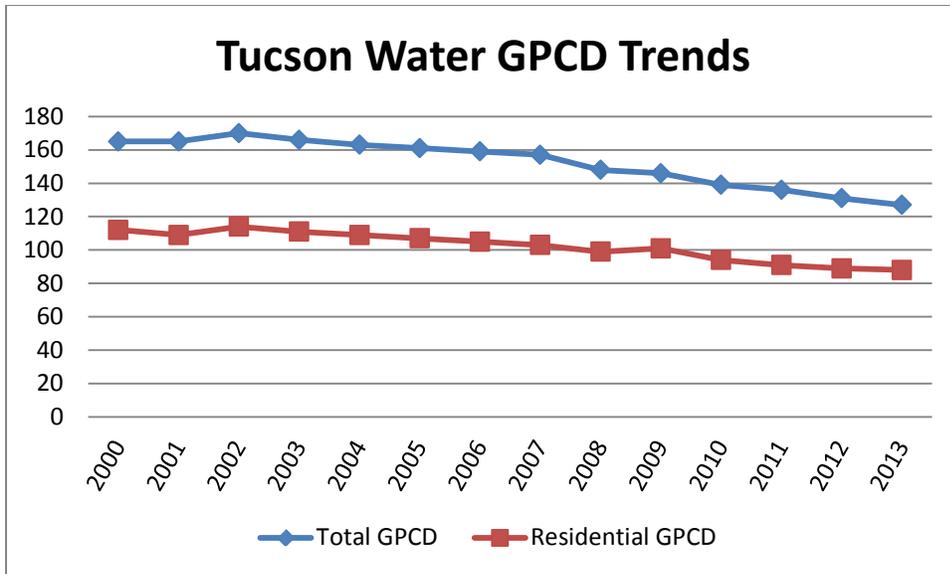


Figure 2: Total and Residential GPCD from 2000 to 2013

Tucson Water works to secure a sustainable and reliable water supply for Tucson residents and water customers, and will continue to evaluate and update its water conservation program to ensure per capita water use does not exceed projections.

Furthermore, Tucson Water is committed to meeting requirements set by Arizona Department of Water Resources (ADWR) Fourth Management Plan.

## Goals, Policies, and Objectives

The water conservation program goal is “To Protect and Enhance Water Resources through Conservation.”

### Policies:

1. Provide an equitable distribution of conservation benefits throughout the customer classes and the community
2. Employ a mix of methods to achieve desired results
3. Develop and utilize guidelines for evaluating water conservation programs to modify existing programs and develop new ones

### Objectives:

1. Reinforce and strengthen the community’s water conservation ethic
2. Maintain compliance with regulatory requirements
3. Ensure adequate supplies are available to meet customer demand, and public health and safety needs

The model used to calculate Tucson Water’s avoided supply costs was developed for the California Urban Water Conservation Council and the American Water Works Association Research Foundation. It is a generalized Excel-based tool which is designed to be applied to any utility configuration. Based on user inputs regarding present and future demands, supplies, and facilities, as well as basic economic assumptions, the model computes seasonal short-run and long-run avoided costs over a user-designated planning period.

In 2006, the Community Conservation Task Force prepared a recommendations report that included a benefit-cost analysis of 48 different conservation measures. For each program, benefit-cost ratios (BCRs) were calculated from three perspectives (Utility, Participant, and Total Resource Cost). In each case, the BCR is calculated as the present value of the program benefits divided by the present value of the program costs.

Utility perspective benefits are the reductions in utility revenue requirements that result from the program. Participant perspective benefits are the reductions in a participating customer's utility bill due to reduced consumption. Total Resource Cost perspective benefits reflect the total economic resources which are expended for the program, whether they are borne by utility or not.

The only programs for which the Total Resource Cost benefit-cost ratios met the threshold are the HET rebates. The rainwater harvesting rebate program has a relatively low benefit to the Utility and a very high benefit to the participant. Efficiency projects shall be evaluated to ensure that water savings are cost-effective. The current avoided-cost model used to evaluate cost effectiveness should be reviewed and compared with other models to determine which is most appropriate.

Additionally, Tucson Water will strive for better coordination with other agencies, departments, and organizations on water management issues. This includes assessing green infrastructure, the urban heat island effect, etc., to evaluate the costs associated with efficient water use to improve the community's quality of life. To conserve water does not mean to stop using water, but to use it efficiently.

Water use studies such as the Residential End Uses of Water Study (REUWS) help to identify the potential for improving water use efficiencies. The REUWS is a research study that examined where water is used in single-family homes in North America published in 1999 by the AWWA Research Foundation and the American Water Works Association. The "end Uses" of water include all the places where water is used in a single-family home such as toilets, showers, clothes washers, faucets, lawn watering, etc. An update to the 1999 report has been underway to repeat the effort and obtain updated results.

The current Mayor and Council policies for water conservation appear to reflect conditions and needs from the 1980s.

1. The City of Tucson is required to meet conservation targets as established by the Arizona Department of Water Resources. Conservation program elements, such as public information and education, incentives and ordinances, will be developed and implemented to achieve conservation targets.
2. The City of Tucson will "Lead by Example" by promoting water conservation and environmental aesthetics by applying the principles of Xeriscape to public projects and following adopted regulations.

These should be updated to reflect the current situation. The role of water conservation requires balancing the development of adequate water supplies with the needs of the utility's customers. There should be a focus on demand-side management and planning to respond to drought. Additionally, the focus of any supply strategy is to satisfy customer water needs in the most cost-effective and efficient manner, minimizing any adverse environmental impact and preserving the quality of life.

Since July 2008, the water conservation program has been supplemented with incentives offered to customers to encourage adoption of water-saving devices and practices. New incentive programs are introduced as pilot projects to ensure that they meet recommended goals, policies, and objectives. The programs are evaluated after a three-year period for water efficiency impacts and cost-effectiveness before being adopted as part of the permanent conservation program. Low participation rates can be examined through surveys and marketing studies to aid efforts to promote greater participation. Those still under evaluation are identified as pilot projects.

Additionally, the rebate application processes and rebate programs will be reviewed and streamlined to reduce staff time and make it easier for customers to participate. Furthermore, the goal is to structure the rebates based on the amount of water saved per retrofit rather than the cost of the retrofit. It is a priority of the water conservation department to create incentives that equitably serve all water customers and the department is working to modify and create new rebate programs with this in mind. Currently the complexity of some rebates confuses customers and increases the cost of implementation or the overall cost per Ccf of water saved because the staff hours required to manage some rebates are high. In the future it also makes sense for Tucson Water to promote incentives that have a lower cost per Ccf to maximize budgetary and staffing needs.

Lastly, objectives for FY 2013-14 were to increase participation in Tucson Water's incentive programs and continue to reduce Tucson's GPCD. The strategy was to strengthen the marketing approach for all programs with public service announcements (PSAs), bill inserts, direct mailings, print ads, web ads, Point-of-sale display racks, and social media. These specific objectives were attained with the HET rebate programs which saw overall participation increase by 27 percent.

## Efficiency Programs – Incentives and Rebates

To ensure that the water conservation strategies selected for implementation were both effective and broadly supported by the community, a Community Conservation Task Force (CCTF) was established by Tucson Water in the summer of 2005. Members of the CCTF represented a wide range of community stakeholders.

The mission of the CCTF was to:

*“Ensure community involvement in the development of a water conservation program strategy that will provide measurable water savings, consistent with the Long Range Water Plan.”*

A stated policy of the conservation program is to provide an equitable distribution of conservation benefits throughout customer classes and the community. Water consumption statistics by customer class reveal that residential customers consume 57% of all water consumed, while multi-family consumes 20%. The combined usage for commercial and industrial class accounts for 23% of the total water usage. (Table 3 references current and new incentive programs by customer class; Figure 3 shows the FY 2013-14 expenditures by class.)

Indoor	Single-Family – 57%	Multi-Family – 20%	Commercial – 23%
	HET	HET	HET
			Urinal
Outdoor			
	Gray Water	Irrigation Upgrade	Irrigation Upgrade
	Rainwater Harvesting		
New			
FY 14-15	Clothes Washer	Clothes Washer	Clothes Washer
FY 14-15		Commercial	Commercial

Table 3: Distribution of Programs by Customer Class

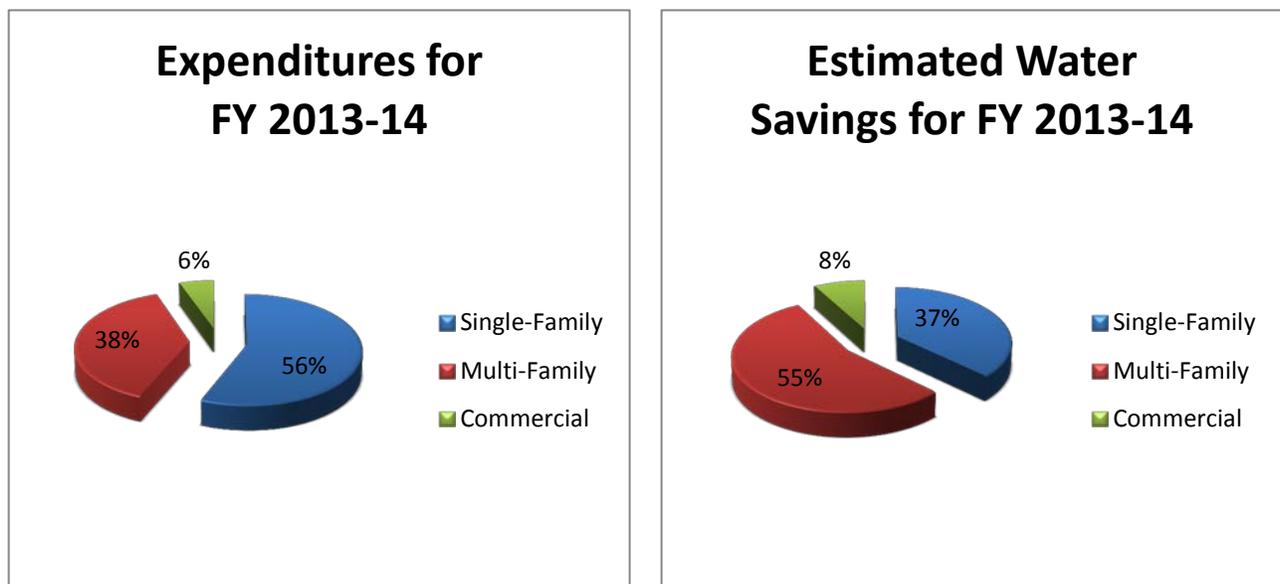


Figure 3: FY 2013-14 Expenditures and Estimated Water Savings by Customer Class

(Tables 4 and 5 report the number of rebates processed for each efficiency program broken down by both calendar and fiscal year.) The HETs and urinals are the number of fixtures replaced and gray water, rainwater harvesting, and the irrigation upgrade are number of participants.

	2009	2010	2011	2012	2013	<sup>3</sup> 2014	Total
<b>Single-Family HET</b>	1,794	2,774	2,166	1,762	2,477	1,092	12,065
<b>Multi-Family HET</b>	149	376	282	1,938	5,097	2,632	10,474
<b>Commercial HET</b>	116	351	586	195	259	148	1,655
<b>Low-Income HET</b>	72	1,313	279	431	918	454	3,467
<b>High-Efficiency Urinal</b>	0	0	16	0	43	68	127
<b>Gray Water</b>	0	0	7	9	11	5	32
<b>Rainwater Harvesting</b>	0	0	0	141	313	114	568
<b>Irrigation Upgrade</b>	0	5	12	11	9	1	38

Table 4: Total Number of Rebates by Calendar Year

	08/09	09/10	10/11	11/12	12/13	13/14	Total
<b>Single-Family HET</b>	353	2,959	2,629	1,716	1,916	2,492	12,065
<b>Multi-Family HET</b>	11	378	284	1,237	3,638	4,926	10,474
<b>Commercial HET</b>	3	428	382	345	136	361	1,655
<b>Low-Income HET</b>	0	542	943	279	834	869	3,467
<b>High-Efficiency Urinal</b>	0	0	10	6	3	108	127
<b>Gray Water</b>	0	0	2	9	11	10	32
<b>Rainwater Harvesting</b>	0	0	0	0	296	272	568
<b>Irrigation Upgrade</b>	0	2	12	8	8	8	38

Table 5: Total Number of Rebates by Fiscal Year

<sup>3</sup> Quantity through June 30, 2014

(Table 6 reports the expenditures for each efficiency program showing each individual program and combined totals by fiscal year; Figure 4 shows the percentage of expenditures by program.)

	08/09	09/10	10/11	11/12	12/13	13/14	Total
Single-Family HET	\$30,036	\$254,688	\$213,543	\$142,812	\$155,473	\$201,955	\$998,507
Multi-Family HET	\$705	\$29,033	\$21,349	\$119,347	\$358,485	\$492,806	\$1,021,725
Commercial HET	\$299	\$37,985	\$36,688	\$25,086	\$12,948	\$28,886	\$141,892
Low-Income HET	n/a	<sup>4</sup>	<sup>4</sup>	<sup>4</sup>	\$280,544	\$287,761	<sup>5</sup>
High-Efficiency Urinal	n/a	n/a	\$2,000	\$1,200	\$900	\$52,400	\$56,500
Gray Water	n/a	n/a	\$265	\$1,568	\$4,144	\$4,678	\$10,656
Rainwater Harvesting	n/a	n/a	n/a	n/a	\$349,461	\$352,858	\$702,319
Irrigation Upgrade	n/a	\$36,465	\$53,220	\$29,082	\$48,964	\$83,676	\$251,406
<b>Total</b>	\$31,040	\$358,171	<sup>5</sup>	<sup>5</sup>	\$1,210,919	\$1,505,020	<sup>5</sup>

Table 6: Rebate Expenditures by Fiscal Year

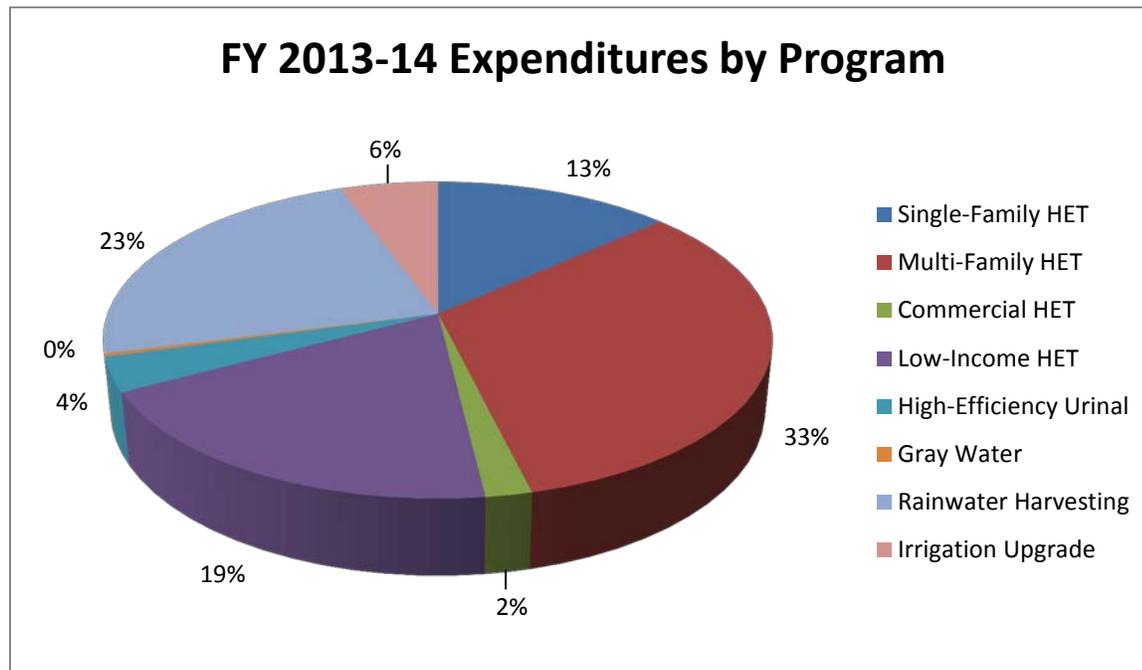


Figure 4: FY 2013-14 Expenditures by Program

<sup>4</sup> Data not available for report

<sup>5</sup> Not totaled because of missing data

(Table 7 compares the expenditures for FY 2013-14 to the estimated water saved per Ccf and provides the cost per Ccf of each program.)

	<b>Expenditure</b>	<b>Saved Water (Ccf)</b>	<b>Cost per Ccf</b>
<b>Single-Family HET</b>	\$201,955	24,928	\$8.10
<b>Multi-Family HET</b>	\$492,806	49,276	\$10.00
<b>Commercial HET</b>	\$28,886	4,932	\$5.86
<b>Low-Income HET</b>	\$287,761	9,965	\$28.88
<b>High-Efficiency Urinal</b>	\$52,400	2,582	\$20.29
<b>Gray Water</b>	\$4,679	174	\$26.89
<b>Rainwater Harvesting</b>	\$352,858	<sup>6</sup> 0	\$352,858.00
<b>Irrigation Upgrade</b>	\$83,676	2,459	\$34.03

Table 7: Cost per Ccf by Program

## Single-Family HET

Implementation date: July 7, 2008

This rebate program is designed to encourage residential (single-family) customers to retrofit older 3.5 or more gallons-per-flush toilets with high-efficiency models. The current program allows Tucson Water customers to receive 50% of the purchase price, with a maximum rebate of \$120 per HET and a maximum rebate of \$200 per household if multiple HETs are installed. This structure has been very confusing to the participants as to how much their rebate will be and time consuming calculating rebates. Additionally, the rebate favors a larger return for those who can afford to replace their toilets.

### Recommendation

In an effort to streamline the application process, create a more equitable rebate, and eliminate the confusion for participants, staff recommends changing the rebate program to \$75 per retrofit limited to two HETs per household. The average single-family HET rebate for FY 2013-14 was \$81. The fixed \$75 rebate will not require an increased budget. The change would become effective March 1, 2015.

### Single Family HET Savings:

*From Tom Arnold, Tucson Water, Management Analyst – 10.28.14*

The single family HET savings of 20.5 gpd (gallons per day) per unit (7,482.5 gallons per annum) comes from an analysis of program participants completed in 2011. This analysis compared water use between 2008 and 2011 of single family households that had participated in the HET rebate program in 2008.

## Multi-Family HET

Implementation date: July 7, 2008

This rebate program is designed to encourage multi-family customers to retrofit older 3.5 or more gallons-per-flush toilets with high-efficiency models. The current program allows Tucson Water customers to receive 75% for the purchase price, with a maximum rebate of \$100 per HET. Most applicants receive the full rebate because installers inflate the cost of the HET on the invoice to maximize the rebate.

<sup>6</sup> Preliminary tracking of water use for systems installed in 2012 are not showing a reduction in water use. The basic evaluation method used by Tucson Water is to compare the usage of a control group to the participants in a conservation program before and after participants have taken some action to reduce their water usage.

**Recommendation**

In an effort to streamline the application process and create a more equitable rebate between classes, staff recommends changing the rebate program to \$75 per retrofit to match the single-family rebate. The average multi-family HET rebate for FY 2013-14 is \$100. The fixed \$75 rebate will not require an increased budget. The change would become effective March 1, 2015.

**Multi-Family HET Savings:**

*From Tom Arnold, Tucson Water, Management Analyst – 10.28.14*

The MF savings come from the original CCTF study which used the same toilet utilization rates, the persons per household and the toilets per household as a ULF program and increased the savings by 6 gallons per day from the ULT to the HET. We have not tried to update this number since then and have not attempted to do any empirical work in trying to measure the change in demand of participants. The equation for this savings number is listed on page 75 of the report; however the savings number of 42.5 gpd may represent the savings per house or dwelling instead of the savings per toilet. For this reason, staff does not feel 42.5 gpd is a good number to use for per unit savings of multi-family replacements. Instead, the single family savings number of 20.5 gpd (7,482.5 gallons per annum) will be used to calculate multi-family savings estimates.

**Commercial HET**

Implementation date: July 7, 2008

This rebate program is designed to encourage commercial/industrial customers to retrofit older 3.5 or more gallons-per-flush toilets with high-efficiency models. The current program allows Tucson Water customers to receive 75% for the purchase price, with a maximum rebate of \$100 per HET, which is the same as the multi-family HET program.

Estimated water savings in nonresidential market segments is not the same. Typically, the greatest water savings can be achieved in restaurants, bars, and retail establishments with the least savings achieved in health-care facilities, offices, and hotel/motels. Furthermore, commercial applications include more types of toilets; the less expensive gravity-tank type and the pressure assist-tank type toilets and the flushometer-valve type toilets that cost more to retrofit. The flushometer-valve type toilets typically save more water because they are found most often in public restrooms that receive more use.

**Recommendation**

In an effort to streamline the application process and create a more equitable rebate between classes, staff recommends changing the rebate program to \$75 per retrofit per gravity-tank type and pressure assist-tank type toilets and \$150 for flushometer-valve type toilets. The average Commercial HET rebate for FY 2013-14 is \$80. It is not anticipated that the fixed \$75 and \$150 rebate will require an increased budget. The change would become effective March 1, 2015.

**Commercial HET Savings:**

Tucson area CII (commercial, industrial, and institutional) Toilet Savings weighted average is 28 gpd (10,220 per annum) for each unit. The weighted average value of 23.3 gpd was calculated for ULFT (ultra low flush toilets) rated at 1.6 gpf (gallons per flush) (see Table 8). HET toilets are 1.28 gpf, or a 20% reduction in flush volume. A 20% additional savings was added to the 23.3 gpd savings, for a total HET savings of 28.0 gpd and is applied to the CII toilet rebate program to determine program savings.

Toilet Count by Sector	# Toilets	GPD savings per ULFT	Daily savings by Sector
Industrial	1,915	23	44,045
Retail	10,008	40	400,320
Restaurants	3,073	47	144,431
Office	12,311	20	246,220
Health care	6,198	21	130,158
Church	1,176	28	32,928
Government	1,620	25	40,500
Other	6,936	18	124,848
Hotels	6,384	16	102,144
Schools:9-12	933	18	16,794
Schools:K-8	19,871	18	357,678
	70,425	Weighted avg savings (gpd)	23.29

Table 8: CII Toilet Savings table reproduced from Tucson Water CCTF Planning Report, 2006 (p. 48)

New calculations for determining water savings for each flushometer-valve type toilet retrofit would be 50 gpd or 16,425 per annum and 23 gpd or 8,030 gallons per annum for each gravity-tank and pressure assist-tank type toilet.

**Future Commercial HET Savings:**

Differentiated water savings were calculated for flushometer-type and gravity-tank or pressure assist-tank types based on the CII estimated toilet savings in the CCTF 2006 report. Flushometer-type tanks predominantly found in the retail and restaurant sector, which have higher savings per unit. A weighted average of 41.64 gpd was calculated for the Retail and Restaurant sectors and the weighted average for the remaining sectors is 19.1 gpd. These estimates were based on ULFTs (1.6 gpf), so a 20% additional savings is added for HETs (1.28 gpf) resulting in 50 gpd for flushometer-type toilets and 23 gpd for gravity-type and pressure-assist tank toilets.

**Low-Income HET**

Implementation date: October 2009

This efficiency program offers free high-efficiency toilet replacements for qualifying low-income homeowners who are Tucson Water customers. The program replaces older toilets that use 3.5 gallons or more per flush. Since many of these older toilets have other functional problems that cause chronic leaking or water flow, the effectiveness of the program is compounded by resolving these issues.

Tucson Water purchases the HETs and the non-profit Community Home Repair of Arizona (CHRA) verifies participants and does the installation. Tucson Water provides financial assistance for the reimbursement of HETs installed. The cost to Tucson Water is \$200 for one HET replacement and \$100 for the second HET or \$300 for two HETs.

Additionally, in fiscal 2012-13, Tucson Water expanded the scope of the program to include supplying materials for repairing water supply leaks in the homes. CHRA uses the materials to repair leaks including faucets, tub/shower valves, main or secondary water lines, water heaters and hose bibbs.

They have also repaired many toilets that did not qualify for replacement. For these water supply repairs, Tucson Water has provided materials, and has not paid for the installation or labor.

Promotion of this program has been through several means:

- Flyer distribution at eligible mobile home parks and townhouse developments
- Craigslist listing under “For Free” or “Household items”
- Public Service Announcements on KXCI radio
- In-field assessments by CHRPA staff and volunteers
- Neighborhood *Promotores* of the Sonoran Environmental Research Institute
- Notice in PCOA’s publication, “*Never Too Late*”
- Promotional materials at service fairs
- Tucson Water promotion at Public Outreach events and in the “message” spot on water bills

**Low-Income HET Savings:**

*From Tom Arnold, Tucson Water, Management Analyst – 10.28.14*

The low-income HET savings of 23.5 gpd per unit (8,577.5 gallons per annum) comes from an analysis of program participants completed in 2014. This analysis compared water use between 2011 and 2014 of low-income households that had participated in the HET rebate program in 2011.

**High-Efficiency Urinal (End of Pilot)**

Implementation date: January 1, 2011; Modified January 1, 2013

This rebate program is designed to encourage commercial customers to retrofit high water-use urinals with high-efficiency models. Because the participation was low, beginning January 2013, the rebate was increased from \$200 to \$500 and the range of options expanded to include all WaterSense-certified as well as waterless models.

**Recommendation**

Staff recommends changing the program back to \$200, which is more in line with the commercial HET rebate and evaluating progress next year. The change would become effective March 1, 2015.

**High-Efficiency Urinal Savings:**

The calculation for determining water savings for each retrofit is 49 gpd or 17,885 gallons per annum.

**Gray Water (End of Pilot)**

Implementation date: January 1, 2011; Modified January 1, 2013

This rebate program is designed to encourage homeowners to install gray water systems for landscape irrigation. Participants must attend a workshop before applying for the incentive. Beginning January 2013, the rebate amount increased from one-third of the cost up to \$200 to one-half the cost up to \$1,000. Participation in the program has remained low with 32 total rebates.

However, preliminary results for 9 participants in 2011 and 2012 show a water reduction of 17 percent comparing 2010 usage to 2013. During the same time, all single-family reduced water use by 8 percent. The participants saw significant declines in water use during the summer months of 2013 of as much as 30 percent compared to 2010.

Staff plans on surveying workshop attendees to obtain more information such as are they using gray water but did not qualify for the rebate and are they using more gray water after attending the workshop.

Nine workshops were held this fiscal year with a total of 132 people attending. Qualifying workshops were offered through SmartScape and Watershed Management Group (WVG). Ten rebates were issued during this fiscal year.

**Recommendation**

Staff recommends continuing the program and evaluating progress next year.

**Gray Water Savings:**

The calculation for determining water savings for each rebate is 35.7 gpd or 13,031 gallons per annum.

**Rainwater Harvesting Incentives Program (2<sup>nd</sup> Year Pilot)**

Implementation date: September 27, 2011; Modified June 1, 2013

The single-family residential rainwater harvesting incentives program is the latest addition of water-saving incentives offered by Tucson Water and was introduced in June 2012, retroactive to September 27, 2011. As shown in Table 7, this program is the most expensive program and not successful with respect to a net water savings and reducing demand.

Tucson Water will rebate qualifying residential rainwater harvesting system costs under two levels of funding:

- Level 1 – Simple/Passive will rebate 50% of the cost of eligible material and labor up to \$500
- Level 2 – Complex/Active System will rebate system costs up to \$2,000 based on gallon capacity:
  - \$0.25 per gallon capacity of 50-799 gallon rain tank
  - \$1 per gallon capacity of 800 gallon and larger rain tank

Applicants may apply for both a passive and active rebate not exceeding \$2,000 for the combination. Additionally, applicants must attend an approved Rainwater Harvesting Incentives Program Workshop to qualify for the rebate program.

The rainwater harvesting incentives program will be at the end of the pilot phase next year. The program will be evaluated for effectiveness. The measure of program effectiveness will be based on three criteria:

1. Water Savings – realized water savings based on historical usage. Water use will be compared to historic with seasonal rainfall considered in the evaluation.
2. Participation – workshop participants, applications, and spatial distribution
3. Cost-Benefit Analysis – costs, benefits, and payback period

Thirty-one rainwater harvesting workshops were held this fiscal year and 750 people attended. Qualifying workshops were offered through SmartScape, Southern Arizona Rain Gutters (SARG), and Watershed Management Group (WVG). Tucson Water is working with the Community Food Bank to qualify rainwater harvesting workshops for the program in both English and Spanish. Additionally, applicants installed cisterns totaling 411,829 gallons of capacity.

**Rainwater Harvesting Savings:**

Preliminary tracking of water use for systems installed in 2012 are not showing a net reduction in water use and in many instances an increase. Assumptions are that rainwater harvesting systems are

encouraging new landscapes and gardens, and the systems are not designed to offset the entire landscape requirement.

**Recommendation**

Because this program is still in pilot phase and has not been evaluated, it is premature to make a recommendation. A methodology for calculating potential water offsets needs to be developed. Furthermore, the program will be evaluated to address the issues of equity in low-income communities.

**Irrigation Efficiency Incentives Program**

Implementation date: July 7, 2008; Modified fall 2014

The Irrigation Efficiency Incentives Program, formerly Irrigation Upgrade Rebate Program, will introduce multi-family and commercial water customers to the concepts of irrigation efficiency and uniformity. Water customers will learn how to fine tune, upgrade, and maintain their in-ground irrigation system to be more efficient resulting in healthier plants and save water.

Water Conservation staff (or contractor) will evaluate existing irrigation systems and make recommendations to improve system efficiency. Staff (or contractor) will show owners and maintenance personnel how to use existing irrigation equipment more efficiently and how to upgrade the system. The goal is to optimize irrigation equipment performance, which improves distribution uniformity and lowers water application rates, resulting in shorter watering times, less waste, and lower water bills.

The revised program will be more prescriptive than in the past; participants were on their own to increase distribution uniformity. The new program will identify specific problems with the irrigation system and the rebate will be proportionate to the amount of repairs and improvements completed. The evaluation will also identify the opportunity to install water saving devices such as rain, soil moisture, and flow sensors as well as weather-based irrigation controllers.

**Irrigation Efficiency Incentives Savings:**

The calculation for determining water savings for each rebate is 630 gpd or 229,950 gallons per annum.

## New Programs

### Clothes Washer Rebate

Start to be determined, 2015

Clothes washing is the second largest water user in most households with an estimated seven loads per week. On average, 12% of the residential water used goes to laundry. One person can generate more than 100 loads per year. This equates to a regular washer using approximately 4,000 gallons of water annually. In addition to saving water, high-efficiency clothes washers save energy.

Clothes washing machines are rated based on a water factor that indicates the number of gallons of water needed for each cubic foot of laundry. A lower number indicates lower consumption and a more efficient use of water. Based on the water factor, high-efficiency clothes washers are divided into three tiers, with Tier 3 being the most efficient. Tier 3 clothes washers use less than 15 gallons per load compared to typical top-loading models that use 40 or more gallons per full load. A Tier 3 high-efficiency clothes washer can reduce water use by 85% and is estimated to save 393 kWh per year. Compared to other high-efficiency models, a Tier 3 clothes washer will use 25 percent less water than a Tier 2 model and 40 percent less than a Tier 1 model. For more information on the Water Efficiency Standards, visit [cee1.org](http://cee1.org).

#### Recommendation

Tucson Water proposes offering residential, multi-family, and commercial customers a \$100 rebate for purchasing a new Tier 3 high-efficiency clothes washer.

#### Clothes Washer Savings:

The calculation for determining water savings for each purchase is 22.92 gallons per day (gpd) or 8,364 gallons per annum. The average number of persons per household in Tucson is 2.46.

### Commercial Rebate

Start to be determined, 2015

Tucson Water's customized commercial rebate encourages businesses and industries to use water efficiently. Rebates help offset the initial costs of installing water-saving hardware, equipment and systems. Rebate amounts are calculated based on estimated water savings to ensure program cost-effectiveness.

The Commercial Rebate Program will be linked to the WaterSmart Business Program and to the Drought Preparedness and Response Plan. Commercial customers using more than 325 Ccf/month must conduct an audit of their facility and develop a water management plan. This program is designed to assist them with meeting that requirement. To qualify for a commercial rebate, participants will participate in the WaterSmart Business Program and have Tucson Water staff or a professional auditor under contract with Tucson Water conduct an audit of the property. The results of the audit will determine the potential for saving water, and the rebate will be based on the amount of water saved.

All retrofits that can prove real water savings will be considered for a rebate excluding the HET, urinal, and clothes washer rebates already in place.

## Community Education Programs

In FY 2014-15, Tucson Water will expand the adult education program with Contractor Landscape Irrigation Training & Certification. Tucson Water will offer Irrigation Association (IA) developed training to address inefficiencies in landscape irrigation systems. Participants will have the opportunity to become certified with the IA after completing the training. Classes will include:

- Advanced Irrigation Design for Water Conservation
- Irrigation System Installation & Maintenance
- Landscape Drip Design
- Landscape Irrigation Auditor
- Landscape Irrigation Design
- Smart Technologies for Irrigation Management

Tucson Water partners with Arizona Project WET (APW) and Environmental Education Exchange (EEExchange) to offer youth education programs, and Smartscape which offers adult education. Table 9 references program budgets since 2005, giving an indication of the expansion of the education programs in Tucson over the last 10 years.

	APW	EEExchange	SmartScape	Total
<b>FY 2004-05</b>	\$15,000			
<b>FY 2005-06</b>	\$20,000	\$114,955		
<b>FY 2006-07</b>	\$20,000	\$100,800	\$100,422	\$221,222
<b>FY 2007-08</b>	\$30,000	\$100,800	\$152,000	\$282,800
<b>FY 2008-09</b>	\$40,000	\$91,800	\$183,000	\$314,800
<b>FY 2009-10</b>	\$50,000	\$91,800	\$190,000	\$331,800
<b>FY 2010-11</b>	\$69,658	\$139,600	\$194,439	\$409,121
<b>FY 2011-12</b>	\$69,658	\$139,600	\$199,563	\$409,121
<b>FY 2012-13</b>	\$135,971	\$139,600	\$206,272	\$481,483
<b>FY 2013-14</b>	\$213,582	\$240,000	\$200,000	\$653,582
<b>FY 2014-15</b>	\$217,636	\$240,000	\$200,000	\$657,636
<b>FY 2015-16</b>	\$221,813	\$200,000	\$200,000	\$621,813

Table 9: Education Program Budget by Fiscal Year

### Arizona Project WET

Tucson Water and The University of Arizona Water Resources Research Center (WRRC) established the first intergovernmental agreement (IGA) with APW in 2006, sponsoring nine workshops and reaching a total of 108 teachers. Participating teachers reported reaching 5,506 students. Since 2006, the program has expanded to reach more than 400 teachers and 18,000 students annually.

APW entered into a new three-year IGA on July 1, 2013, to enhance the ability of teachers to instruct and students to learn about local issues pertaining to water. The work program defined in the IGA encompasses three educational areas: professional development, student educational programs, and community outreach.

Professional development includes STEM Academies and workshops to support curriculum integration. APW also works with district specialists to develop and provide professional development necessary for teachers to evolve instructional practices for 21<sup>st</sup> Century Learning. Partnerships with other

organizations increase the breadth of offerings, and extend APW's exemplary professional development and education to a wider audience.

Student educational programs include: 3<sup>rd</sup> grade groundwater flow model presentations, 3<sup>rd</sup> grade Sweetwater Wetlands Water Festivals, 6<sup>th</sup> grade groundwater flow model presentations, school and home water audits in middle and high school, and community water festivals for 4<sup>th</sup> grade students. Community outreach events include Tucson's multi-day Funfest and Festival of Books as well as single day family science events at various venues.

In fiscal year 2013-14, Arizona Project WET provided direct instruction to 18,070 students, their 439 teachers, and 4,463 adults. Student-driven school water audits and Water Scene Investigations resulted in a projected water savings of 1,480,071 gallons/year. A record 354 teachers engaged in professional development that evolved their content knowledge, instructional practices, and ability to use technology to engage the 16,606 students they report teaching annually. These accomplishments were a result of direct instruction totaling 2,172 facehours. A facehour is defined as an hour where an APW educator is directly involved in educating students, teachers, and adults.

Professional development offerings in Tucson increased this fiscal year, providing 18 days of workshops for a total of 354 teachers. These offerings are critical for educators as analyzed by the National Academies' Committee on Integrated STEM Education; "Apart from subject-specific content knowledge, the ability and confidence to teach across subjects will be critical for educators called upon to deliver integrated K-12 STEM Education. Educators will need to know how to provide instructional supports that help students recognize connections between disciplines, and they will need to support students' developing proficiency in individual subjects in ways that complement students' learning through integrated activities" (National Academies Press, 2014, *STEM Integration in K-12 Education: Status, Prospects, and an Agenda for Research*, P.7). APW worked with curriculum specialists to assess district and school needs and leverage resources from Tucson Water and other partners to provide professional development for educators that focused on the necessary instructional practices to deliver integrated STEM education.

(See *Appendix C* for the full APW 2013-14 Annual Report)

## **Environmental Education Exchange**

The EEExchange began working under contract with Tucson Water in 1998 to develop and manage three water conservation education programs. The programs focused primarily on first through third grade. Together, the programs reach over 13,000 students annually in grades one through eight in multiple school districts throughout the Tucson Basin. Originally, Tucson Water commissioned the EEExchange to develop an outreach program that would bring hands-on activities to fourth and fifth grade classrooms. In 1993, the Exchange developed *Our Water, Our Future*, and a two-part program consisting of five teacher-led activities followed by an interactive 90-minute presentation from an outreach educator. Now an hour-long presentation, *Our Water, Our Future* has reached over 2,200 classrooms, and is now an institution for many local fourth and fifth grade teachers.

In addition to developing *Our Water, Our Future*, the Exchange also manages the program. This entails contacting teachers, scheduling programs, revising curriculum activities, hiring and training presenters, maintaining equipment, conducting ongoing evaluation of the program, and otherwise coordinating this outreach effort. The on-site presentation is offered by a lively "Doctor Faucet" character and includes graphics, activities with a specially customized groundwater model, an overview of the water treatment process, ideas for water conservation, and complementary shower timers for each student. *Our Water,*

*Our Future* was revised for the start of the 2013-14 school year, with changes to the pre- and post-visit lessons, as well as to the on-site presentation. An exciting addition to *Our Water, Our Future* is a full-color activity book given to each student at the end of the presentation.

The Water Info Van Program, which begins with a short video, soon became known as *Da Drops* in honor of the animated talking water drops that take students on a journey beginning in the clouds and ending in the kitchen sink. The presentation focuses on groundwater model activities in which students experience changes in how people have used water over time. Working with another customized groundwater model, students first retrieve water with miniature buckets from the Santa Cruz River and later pump water through modern wells at a rapid rate. This teaching tool clearly demonstrates the connection between Tucson's growing population, diminishing underground water supply, new sources of water from the Colorado River and recycled water, and the importance of helping to conserve water on a daily basis. At the end of this hour-long program, the presenter passes out student activity booklets and a reusable cup for each student that encourages them to "*Brush up with Just One Cup!*" *Da Drops* has reached over 83,000 students and has also become an institution for many local first through third grade teachers. As an outgrowth of these highly successful elementary school programs, Tucson Water contracted the Exchange to develop and manage a middle school water education program as well. In the year 2000, the Exchange produced the *Tucson Toolkit: Perspectives on Our Water*, a five-unit curriculum developed for middle school science teachers to integrate into their lesson plans. The *Tucson Toolkit* contains nine engaging hands-on activities such as collecting transpiration from leaves, constructing a miniature Mount Lemmon, and building a model to investigate groundwater contamination. After the class has learned why water is such a precious and limited resource in southern Arizona, students measure the flow rate of their showerheads at home. Those who report high flow rates receive a water-saving showerhead. The *Tucson Toolkit* differs from the other programs in that no presenter visits the classroom and all of the activities are led by the classroom teacher. All students receive a workbook, shower timer, and flow rater measurement bag. Because the *Tucson Toolkit* materials have become dated, and there was a desire to have a middle school on-site classroom presentation, the *Toolkit* will no longer be offered after this school year (although parts of it will be incorporated in to the new program).

During 2013-14, *El Tour de Agua*, a new middle school program including an on-site classroom presentation, was developed. The program focuses on water sources, water recycling, and water conservation. Students are taught to question if their water sources are reliable, safe, and sustainable. The classroom presentation is approximately one-hour in length and uses a Prezi media format rather than posters, for a more exciting and interactive learning experience. Teachers show a pre-visit PowerPoint presentation to their students for background information (with a related Student Study Guide), and follow up with a post-visit lesson on water conservation (using the Shower Flow Kit materials that are student giveaways). *El Tour de Agua* was piloted to 50 classrooms in April and May 2014.

(See *Appendix D* for the full EExchange 2013-14 Annual Report)

### **SmartScape: A Landscape Water Conservation Education Program**

Since 1989, Tucson Water has executed a series of IGAs with the University of Arizona for a landscape water conservation program designed to reduce water consumption. With this partnership, Tucson Water launched a WaterSmart program in 1990 aimed at homeowners to broaden the community's water conservation ethic. The first phase focused on indoor use, targeting plumbing supply retailers to promote the sale and use of water-efficient plumbing fixtures. In 1992, a series of workshops were

developed to reduce water use inside and outside the home and were offered to both homeowners and landscapers. By the end of 1992, the need for training specifically tailored to landscape professionals was identified.

SmartScape's "*A Training Program for Landscape Professionals*" was launched in both the Tucson and Phoenix areas in 1994 and was developed collaboratively by Tucson Water, the University of Arizona Cooperative Extension, Arizona Municipal Water Users Association, the Arizona Nursery Association, the Arizona Landscape Contractors Association, and industry representatives. The program is a comprehensive, research-based training program that instructs landscape professionals in the fundamentals of design, installation, irrigation, and maintenance of low-water-use landscapes. Key components of the program are the need for efficient water use, the regulatory environment, methods of water conservation in the landscape, and the principles of Xeriscape. The series of nine classes are taught by local industry experts.

A main objective of the SmartScape program is to build capacity within the landscape industry to design, install, and maintain water-efficient landscapes. Additionally, the program promotes the adoption of water-efficient landscapes, and increases irrigation efficiencies in the residential, multi-family, commercial, and industrial user classes by conducting workshops, seminars, and training programs and developing appropriate educational materials.

In FY 2013-14, 85 workshops attracted 2,023 people. Professional topics include:

- Advanced SmartScape: four modules
- SmartScape: nine session training series for landscape professionals
- Spanish SmartScape: nine session training series for landscape professionals
- Turf Irrigation Management

Homeowner workshops include:

- Gray Water
- Hands-on Drip Irrigation
- Hands-on Landscape Design Series
- Irrigation Scheduling Made Simple
- Landscape Design & Renovation
- Rainwater Harvesting

## **Community Outreach**

### **National Mayor's Challenge for Water Conservation**

The National Mayor's Challenge for Water Conservation is a friendly online competition among cities that encourages citizens to pledge to take steps to achieve water and energy efficiency. Tucson has placed 6<sup>th</sup>, 1<sup>st</sup>, and 2<sup>nd</sup> in its three years of participating in the 300,000-599,999 population city category.

Tucson Water promotes the Challenge through multiple strategies. Participants receive information on Tucson's water web page for the challenge. Information is disseminated through newsletters, bill messaging, media releases, and auto-replies for certain Tucson Water GroupWise mail boxes. Social media is used with Facebook and Twitter. Additionally, partnerships with organizations help to spread the word as well as participation in local events.

The Wyland Foundation and Toyota Corporation sponsor the Challenge and have been very impressed with Tucson Water as a leader and model for water conservation and efficiency. Wyland's MLE – Mobile Learning Experience, an interactive classroom on wheels – has visited a Tucson school two years in a row while on its national tour. Wyland has also used Mayor Jonathan Rothschild in its promotional spots for the Challenge, which takes place in the month of April.

### **Outreach and Promotion**

Public relations at Tucson Water are strategically planned. It is an on-going process of building a mutually beneficial relationship between Tucson Water and our numerous stakeholders. Customer surveys and input from Mayor and Council are utilized. Relationships are built by attending numerous events where staff can talk to customers face-to-face. Free giveaways and printed materials are offered at events and point-of-sale locations in order to help people learn more about water and how to conserve it.

Tucson Water completed two surveys during the Fiscal Year. A random phone survey focusing on conservation was conducted by an outside contractor. Another survey was completed in-house using Survey Monkey. This survey focused on how customers prefer to receive information from Tucson Water. At events, staff has been asking the public to take a short survey on a tablet or by paper if they prefer. We have not had a large number of people do this, but we plan to continue using the tablets at events.

Additionally, two surveys are underway with the University of Arizona through an IGA to collect information to help with planning about residential and commercial incentive programs.

Advertising is a component of public relations. Getting the message out through television advertising, web advertising and sponsoring events has proven successful. Tucson Water advertisements usually feature one of the following topics: Water Reliability, Gray Water, Rainwater Harvesting or Toilet Rebate information.

Staff from the Public Information and Conservation Office participates in many community events throughout the year. These opportunities allow them to share materials about Tucson Water's rebate and incentive programs. In addition, publications and displays on water supply, service, and efficiency are always in demand. Pete the Beak, Tucson Water's mascot since the 1970s, is now known by several generations of Tucsonans.

Tucson Water can be found at SAHBA's Fall and Spring Home Shows; multiple Earth Day celebrations; local health, safety, and back-to-school fairs; area business and employee events; and a variety of festivals that promote sustainability-related themes.

Staffing events has proven to be a valuable method of direct contact with residential and commercial customers, who then gain a better understanding of Tucson Water's investments and commitments to ensure a reliable water supply now and for the future.

The website, social media, and e-mail system are also used to extend invitations for water-related materials and information. Most of Tucson Water's publications are available free by mail upon request. Notices are posted on many web pages, sent via Twitter and Facebook, and included in auto-replies for various department mailboxes.

Tucson Water has a YouTube page with 12 playlists and more than 100 videos. Good selections of these are on water conservation and efficiency and are additional resources for our customers.

Another avenue for promoting conservation and incentive programs has been placement of display racks at nurseries, plumbing supply, and home improvement retailers. Racks are stocked with brochures, rebate applications, and publications on water efficiency. Relationships have been established with multiple businesses to the benefit of all parties: Retailers see an increase in sales of products eligible for rebates to their customers, participation in Tucson Water conservation programs rises, and residents become more aware of options they have to save water and money.

PICO staff has continued working on the new, unified look of our printed materials. Previously Tucson Water brochures and handouts had a variety of looks; making the public unsure if they were picking up materials from Tucson Water. First we put a plan together to unify materials. Then we asked two public relations firms that are under contract to come up with 3-4 new designs for our brochures, monthly bill insert, and website. We wanted to get staff more involved so we asked 10 City employees, with most coming for Tucson Water, to pick their favorite and to rate the looks. A clear favorite was determined and redesigning materials as needed has near completion on this project.

Not only did this feel like a true team project with having a group from different areas decide on a new look, but it also brought our outside agencies a chance to work more closely together and build a team.

## **Water Waste Enforcement**

Two Utility Service Representatives (conservation inspectors) conduct water waste inspections throughout the Tucson Water service area. Water waste typically involves overwatering, malfunctioning irrigation systems, hose washing of hard surfaces, and misting systems operating in unoccupied areas. They also provide high bill investigations for commercial properties.

Conservation inspectors made 676 visits in FY 2013-14, and issued 457 verbal and 19 written warnings. Two citations were issued. The fine structure for a first offense is a minimum of \$250. Subsequent offenses within three years are a minimum of \$500. They conducted 31 high bill investigations which assist customers in reducing their water-use.

## **WaterSmart Business Program**

The WaterSmart Business (WSB) Program is managed by the Public Information and Conservation Office in consultation with an advisory group. The group developed best management practices for water-

users in their business classes, established guidelines for certification, and assisted in developing signage, incentives and workshops offered through WSB. More than 15 businesses and government agencies were represented in the advisory group, including: AZ Small Business Association, AZ Landscape Contractors Association, International Facility Managers Association, Building Owner and Managers Association, Southern Arizona Lodging and Resort Association, the Chamber of Commerce, Pima County, and the Arizona Society of Landscape Architects, among others.

The WSB certification was initiated to build relationships between Tucson Water and the business community and offer businesses easier contact if concerns arise. Additionally, Tucson Water is able to use the relationships to assist in achieving greater water savings.

Businesses participating in the certification process receive a free water audit to determine how they can use water more efficiently and save money. Businesses that become certified will be listed on the City’s website and receive recognition from the City for their efforts to conserve water. Moreover, participating businesses are more likely to be prepared for understanding the requirements of the Drought Preparedness and Response Plan because stages two through four of the ordinance require businesses to create a water conservation plan and reduce water-use. (The Drought Preparedness and Response Plan is available at [cms3.tucsonaz.gov/water/drought-intro](http://cms3.tucsonaz.gov/water/drought-intro).) As stage two may be in the near future, preparing businesses to manage water-use more efficiently is a high priority. The Plan requires self-audits and conservation measures for commercial/industrial customers with a volume usage at/or exceeding 325 Ccf monthly.

Tucson businesses are on par with the U.S. national percent for water-use by commercial class. (Figure 5: Water-Use by Commercial Class – Tucson.) Office and educational customers in the Tucson Water service area use water at a slightly higher percent than the national average, whereas hospital and restaurant customers use less.

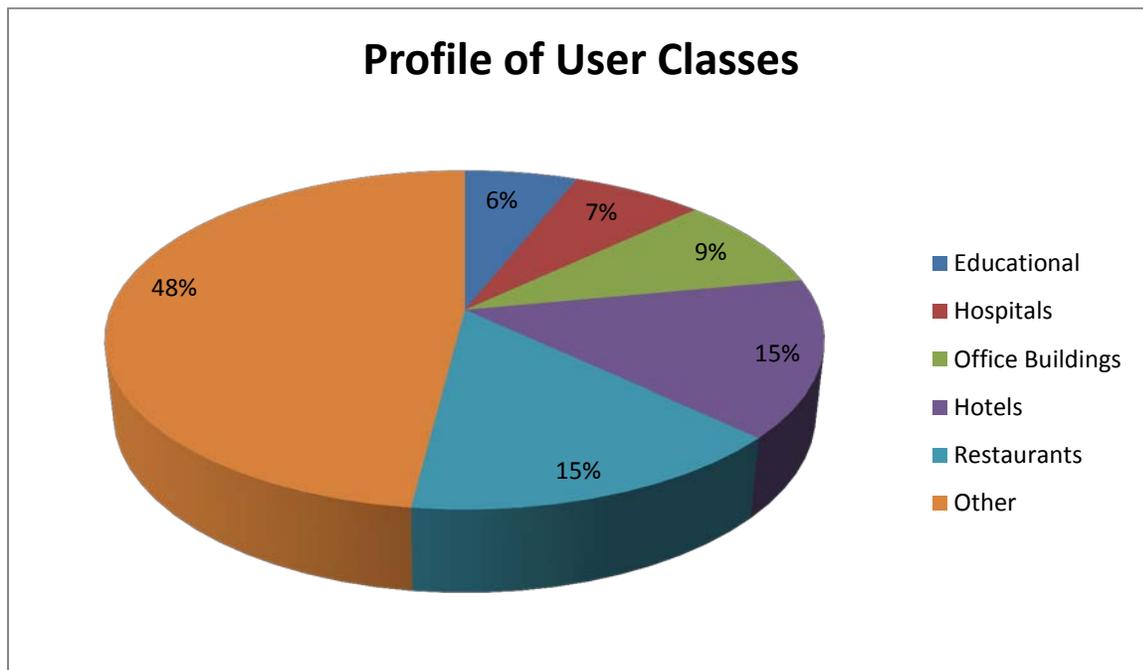


Figure 5: Water-Use by Commercial Class – Tucson

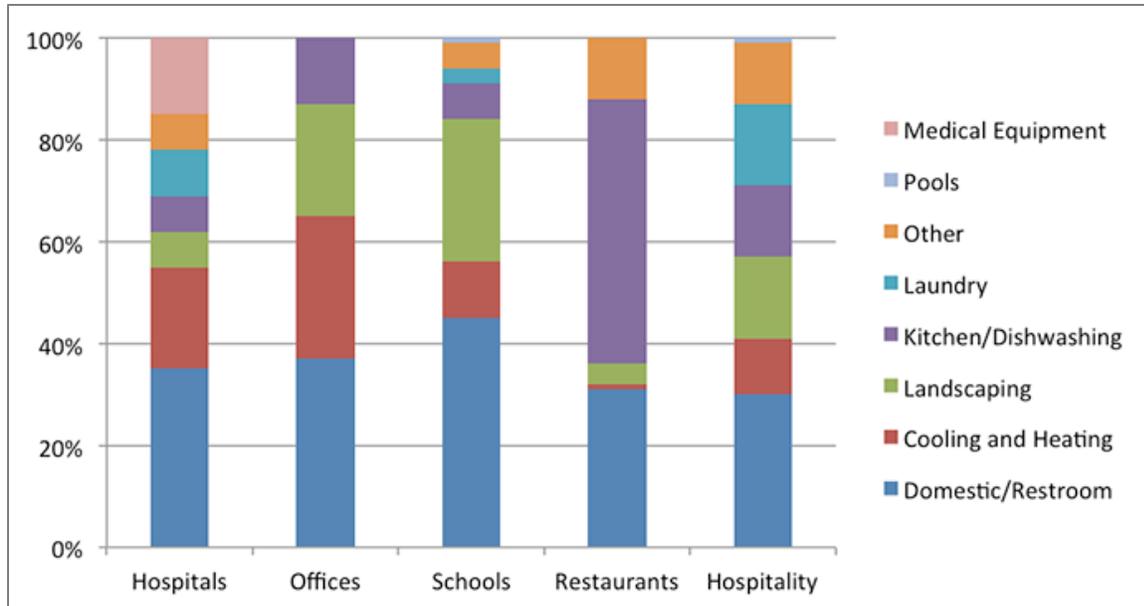


Figure 6: End Uses of Water in Various Types of Commercial and Institutional Facilities

Commercial classes have varying purposes for their water use. For example, hospitals tend to use more water than other commercial types to operate medical equipment, offices typically use more water for cooling and heating, and restaurant use occurs in food preparation and for dishwashing. (Figure 6 offers a more detailed breakdown.) These statistics are somewhat more complicated to compile for industry, as its water use is normally driven by resource extraction or production and is industry and site specific.

**Recommendations:**

In efforts to garner greater participation in the WSB program several changes to the program are proposed:

- Redesign the reduction in water-use percent criteria for certification. Instead use a custom approach to certification levels, which will evaluate each class and site for its unique characteristics and opportunities to conserve water.
- Conduct a water conservation walk-through or provide a professional water audit. Site complexity will determine whether a walk-through by Tucson Water staff or a professional audit is performed.
- Use a custom commercial rebate to assist businesses in meeting the water efficiency outlined in their audit. The custom commercial audit will be based on performance measures.

**Water Harvesting Demonstration Sites**

There are currently 16 demonstration sites throughout Tucson that familiarize residents with a variety of water harvesting and usage projects. Staff works closely with all sites which include ward offices, Tucson Botanical Gardens, Reid Park Zoo, a community garden, and a bike path.

Sites are in various stages of development: some have been completed, some are under construction, and others have not yet broken ground. All sites have until the end of next fiscal year to be completed. A website featuring a guided tour of the sites is near completion.

## **Appendix A – Five-Year Financial Plan**

(Included as a pdf report)

# TUCSON WATER

## CONSERVATION PROGRAM Preliminary FY 2014 - FY 2019 CCTF CWAC Conservation Sub-Committee Recommended

	2014	2015	2016	2017	2018	2019
<b>PROJECTED CONSUMPTION*</b>						
<b>Potable Water Consumption Projection (Ccf)</b>	40,103,234	39,344,834	38,667,148	37,986,478	37,302,826	36,616,190
<b>REVENUES</b>						
<b>Beginning Balance</b>	\$ 2,222	\$ 2,079	\$ 1,783	\$ 1,336	\$ 734	\$ 346
	<b>Inc</b>	<b>Rate</b>				
Water Sales (7/05/13 Rates)	0.07					
	\$ 2,807	\$ 2,754	\$ 2,707	\$ 2,659	\$ 2,611	\$ 2,563
Water Sales Increases from Rate Adjustments:						
<i>FY 2015 Rate Adjustment</i>	0.00	0.07	\$ -	\$ -	\$ -	\$ -
<i>FY 2016 Rate Adjustment</i>	0.00	0.07		\$ -	\$ -	\$ -
<i>FY 2017 Rate Adjustment</i>	0.00	0.07		\$ -	\$ -	\$ -
<i>FY 2018 Rate Adjustment</i>	0.01	0.08		\$ 373	\$ 366	\$ 366
<i>FY 2019 Rate Adjustment</i>	0.01	0.09			\$ 366	\$ 366
Total from Rate Adjustments	\$ -	\$ -	\$ -	\$ -	\$ 373	\$ 732
<b>Water Sales (including Rate Adjustments)</b>	\$ 2,807	\$ 2,754	\$ 2,707	\$ 2,659	\$ 2,984	\$ 3,295
<b>Total Revenues Available</b>	\$ 5,029	\$ 4,833	\$ 4,490	\$ 3,995	\$ 3,718	\$ 3,641
<b>PROJECTED REQUIREMENTS</b>						
<b>Total Conservation Requirements</b>	\$2,950	\$3,050	\$3,154	\$3,261	\$3,372	\$3,487
<b>Projected Surplus/(Deficit)</b>	\$ 2,079	\$ 1,783	\$ 1,336	\$ 734	\$ 346	\$ 155

Projected consumption ties directly to the proposed Financial Plan for FY 2014 - FY 2019

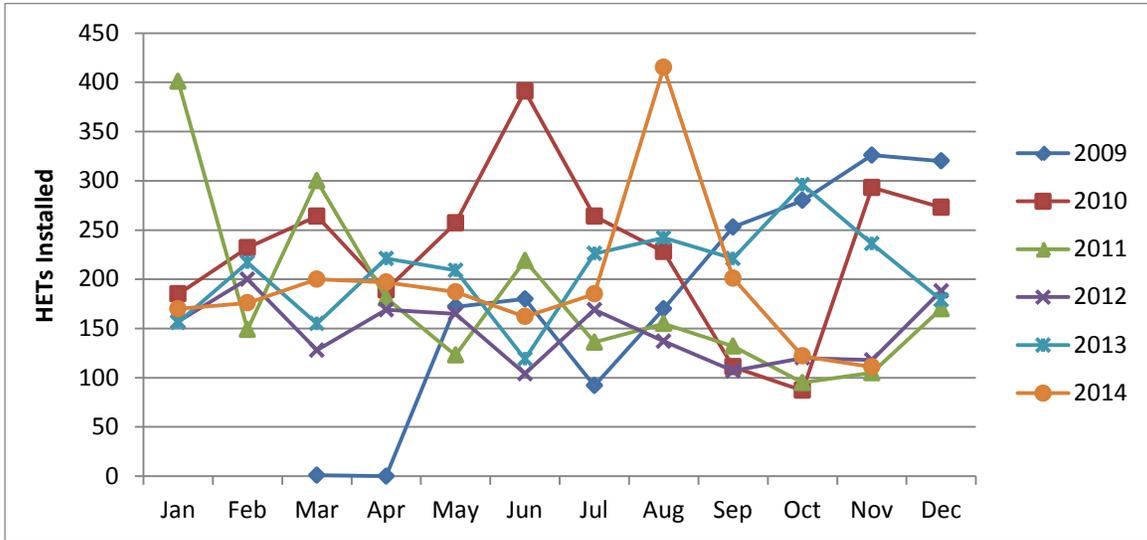
## **Appendix B – FY 2013-14 Efficiency Program Implementation**

(Included as a pdf report)

**Tucson Water**  
**Efficiency Program Implementation**  
**FY 2013-14 Through June**

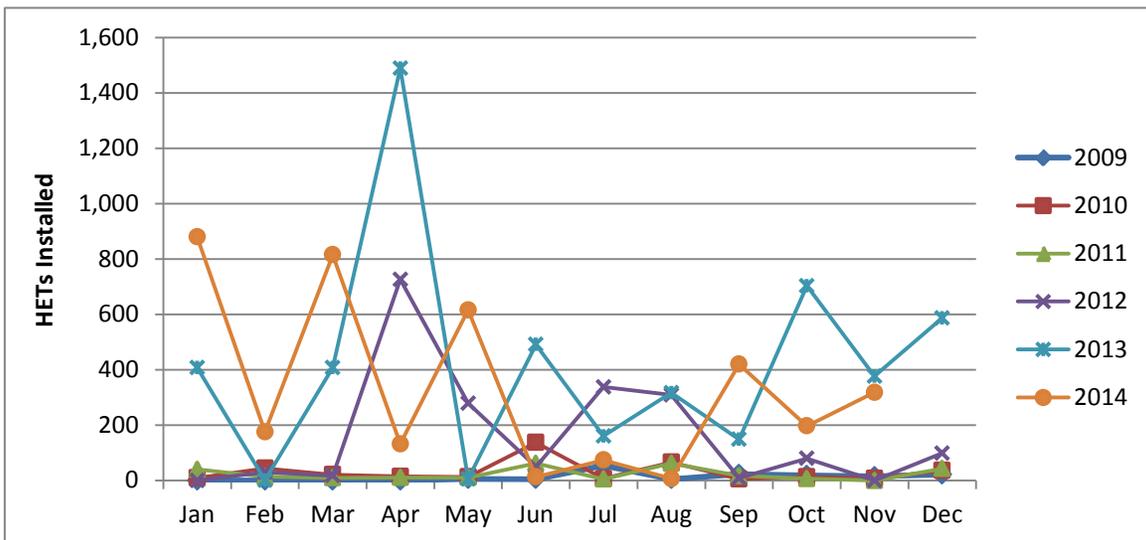
**Single-Family HET**

HETs Installed	2,492	Start Date: Jul-08	
Estimated Gallons Saved	18,646,390		
Staff Labor Hours	1,903		
Budget	\$ 200,000	<b>Cumulative Water Saved</b>	
<sup>1</sup> Expenditure/Rebates	\$ 201,955	Gallons	291,076,733
Percent of Budget	101%	Ccfs	389,140
		Acre-Feet	893



**Multi-Family HET**

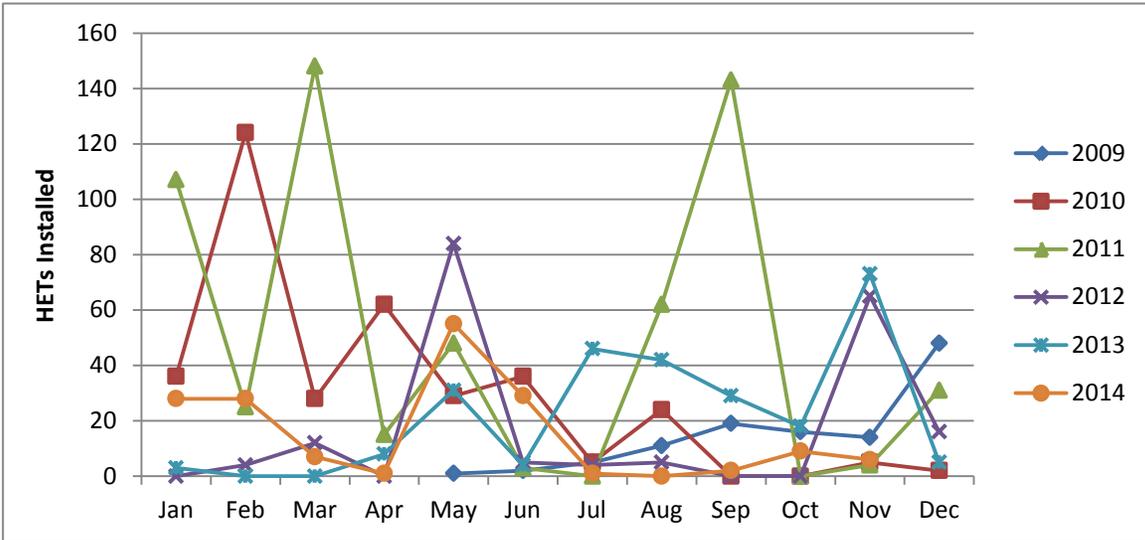
HETs Installed	4,926	Start Date: Jul-08	
Estimated Gallons Saved	36,858,795		
Staff Labor Hours	167		
Budget	\$ 495,000	<b>Cumulative Water Saved</b>	
<sup>1</sup> Expenditure/Rebates	\$ 492,806	Gallons	142,204,913
Percent of Budget	100%	Ccfs	190,114
		Acre-Feet	436



**Tucson Water**  
**Efficiency Program Implementation**  
**FY 2013-14 Through June**

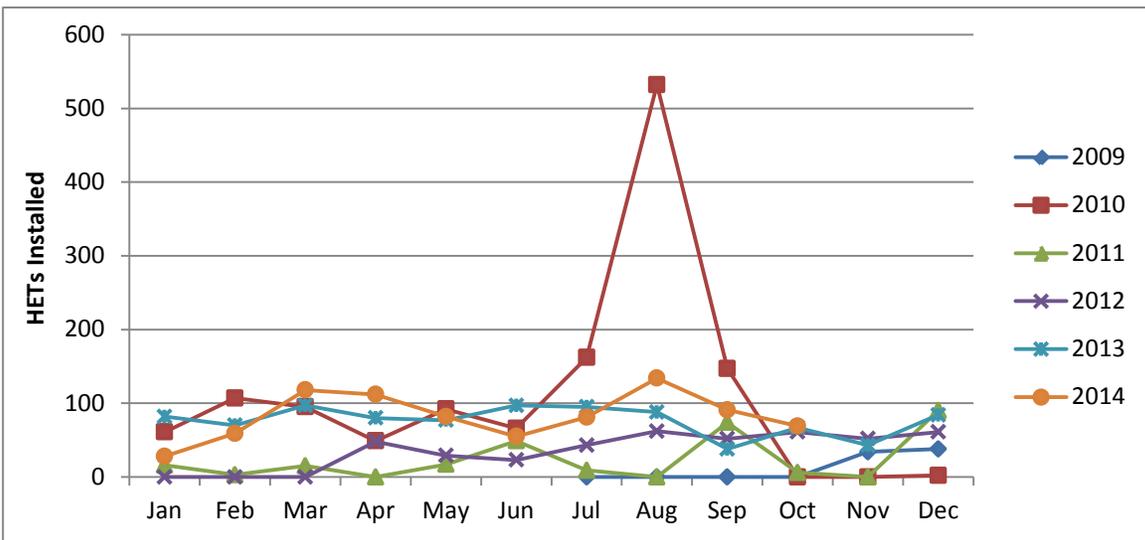
**Commercial HET**

HETs Installed	361	Start Date: Jul-08
Estimated Gallons Saved	3,689,420	
Staff Labor Hours	97	
Budget	\$ 30,000	<b>Cumulative Water Saved</b>
<sup>1</sup> Expenditure/Rebates	\$ 28,886	Gallons
Percent of Budget	96%	Ccfs
		Acre-Feet



**Low-Income HET**

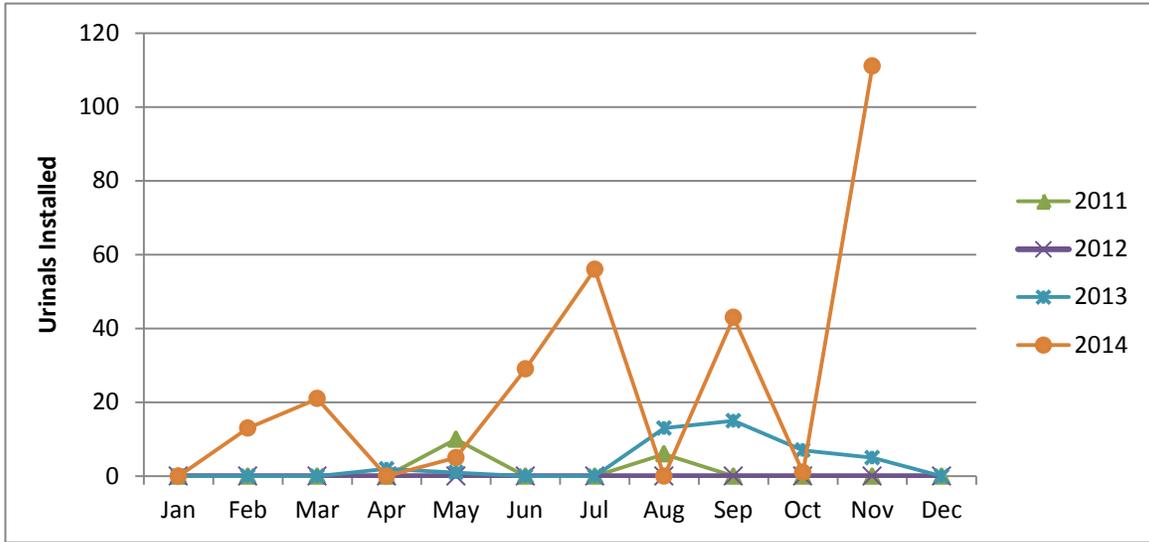
HETs Installed	869	Start Date: Oct-09
Estimated Gallons Saved	7,453,848	
Staff Labor Hours	144	
Budget	\$ 245,000	<b>Cumulative Water Saved</b>
<sup>1</sup> Expenditure/Rebates	\$ 287,761	Gallons
Percent of Budget	117%	Ccfs
		Acre-Feet



**Tucson Water**  
**Efficiency Program Implementation**  
**FY 2013-14 Through June**

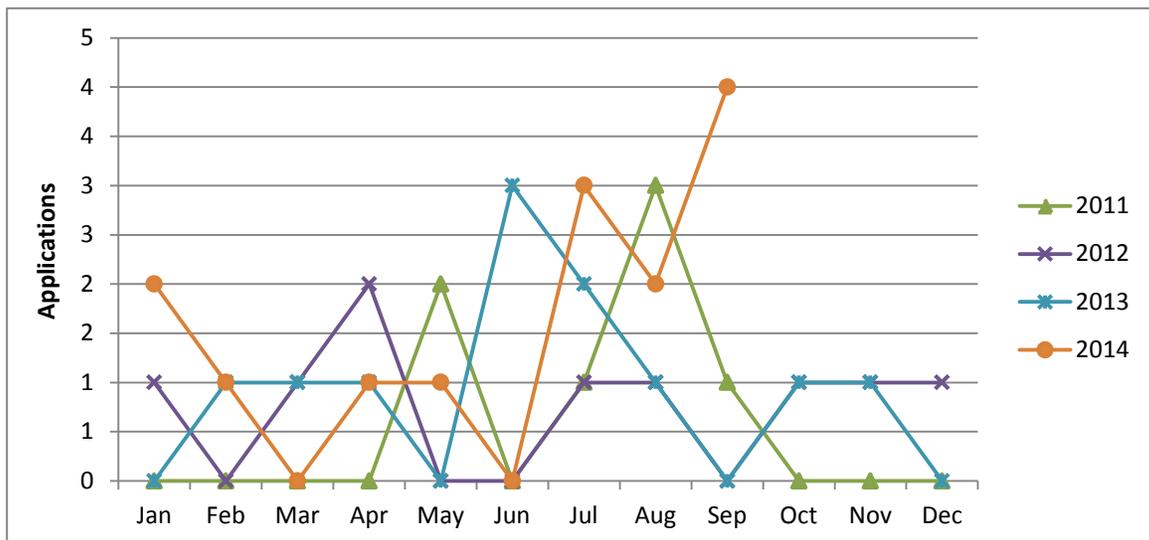
**High-Efficiency Urinal**

HEUs Installed	108	Start Date: Jan-11
Estimated Gallons Saved	1,931,580	
Staff Labor Hours	137	
Budget	\$ 45,000	<b>Cumulative Water Saved</b>
<sup>1</sup> Expenditure/Rebates	\$ 52,400	Gallons
Percent of Budget	116%	Ccfs
		Acre-Feet



**Gray Water**

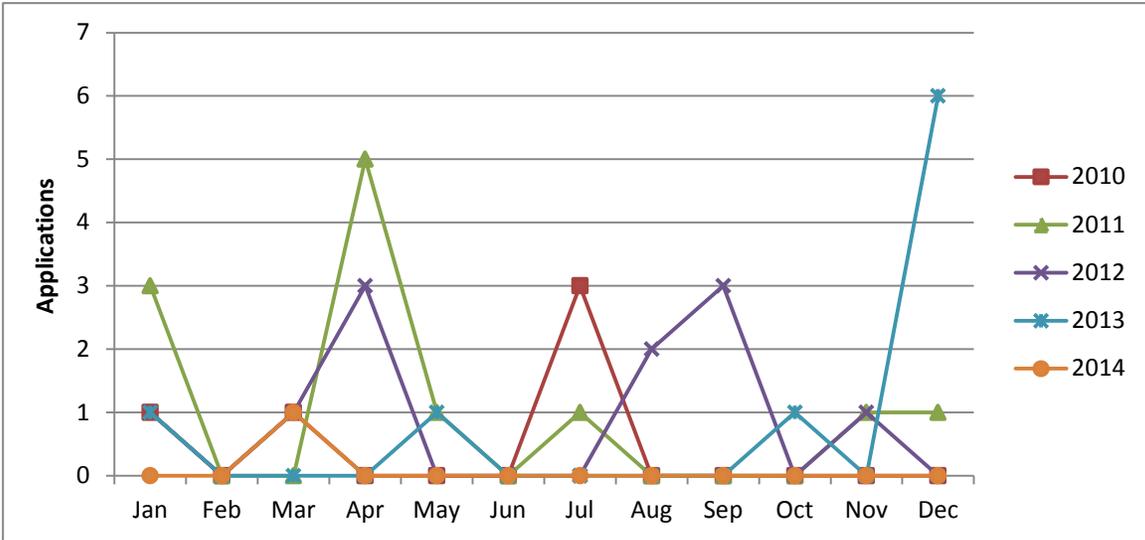
Applications	10	Start Date: Jan-11
Estimated Gallons Saved	130,310	
Staff Labor Hours	57	
Budget	\$ 5,000	<b>Cumulative Water Saved</b>
<sup>1</sup> Expenditure/Rebates	\$ 4,678	Gallons
Percent of Budget	94%	Ccfs
		Acre-Feet



**Tucson Water**  
**Efficiency Program Implementation**  
**FY 2013-14 Through June**

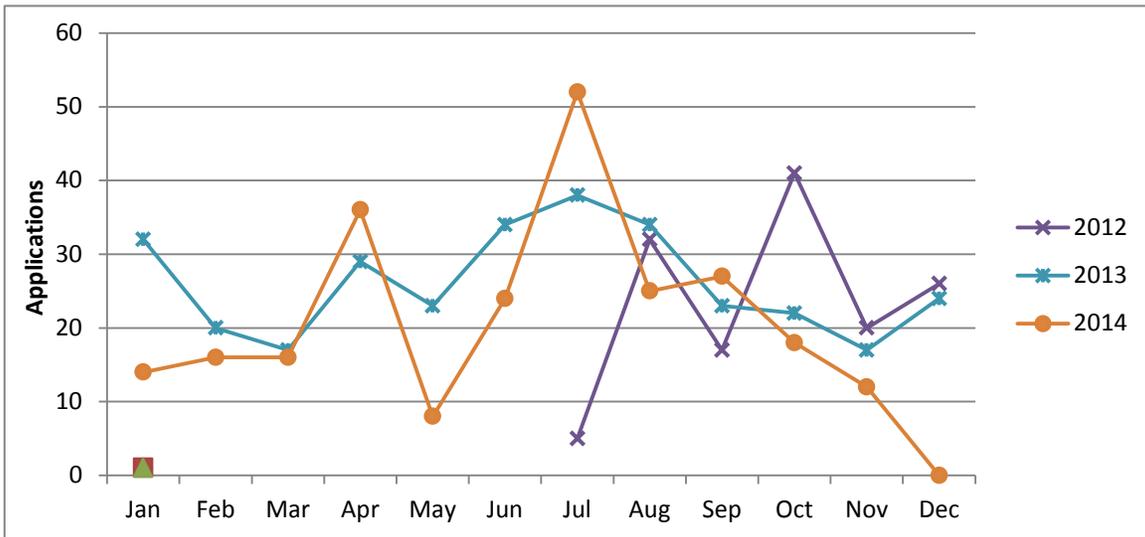
**Irrigation Efficiency**

Applications	8	Start Date: Jul-08
Estimated Gallons Saved	1,839,600	
Staff Labor Hours	385	
Budget	\$ 70,000	<b>Cumulative Water Saved</b>
<sup>1</sup> Expenditure/Rebates	\$ 83,676	Gallons
Percent of Budget	120%	Ccfs
		Acre-Feet



**Rainwater Harvesting**      Level 1      Level 2

Applications	32	240	Start Date: Jun-12
Estimated Gallons Saved	0		
Staff Labor Hours	229		
Budget	\$ 350,000		<b>Cumulative Water Saved</b>
<sup>1</sup> Expenditure/Rebates	\$ 352,858		Gallons
Percent of Budget	101%		Ccfs
			Acre-Feet



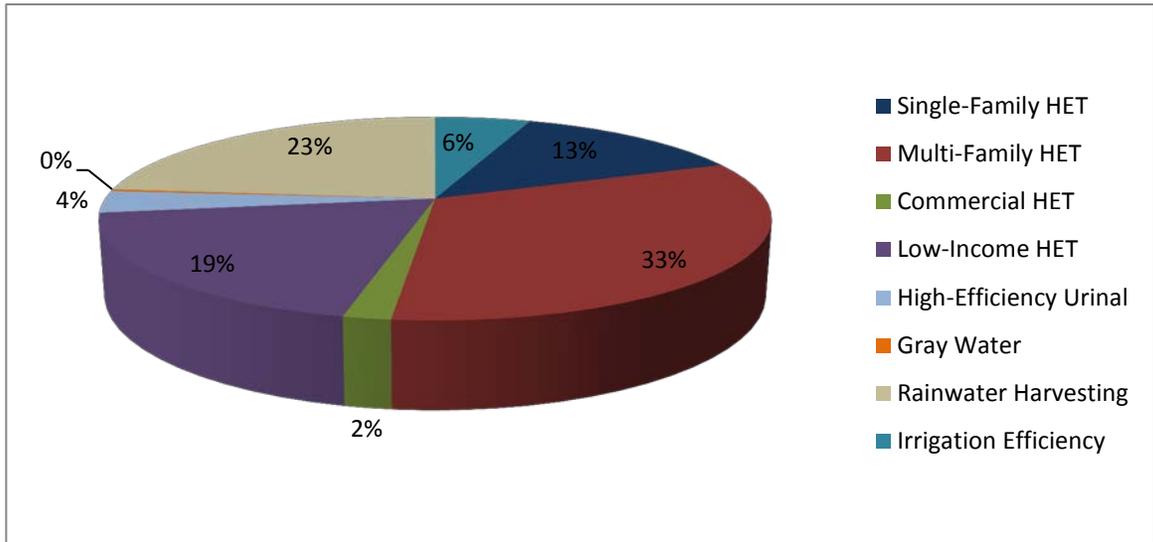
**Tucson Water  
Efficiency Program Implementation  
FY 2013-14 Through June**

**Program Totals**

HETs/HEUs Installed	8,756
Estimated Gallons Saved	70,549,943
Staff Labor Hours	3,119
Budget	\$ 1,440,000
<sup>1</sup> Expenditure/Rebates	\$ 1,505,020
Percent of Budget	105%

<b>Cumulative Water Saved</b>	
Gallons	600,863,362
Ccfs	803,293
Acre-Feet	1,844

**Expenditures by Program**



<sup>1</sup>The expenditure does not include the cost of staff time

## **Appendix C – Arizona Project WET 2013-14 Annual Report**

(Included as a pdf report)

# Arizona Project WET - City of Tucson IGA Annual Report 2013-14

Arizona Project WET (APW) shares the City of Tucson's goal to promote responsible water stewardship through excellent and effective education. Program data is summarized below.

<b>2013-14 School Year Summary</b>				
<b>All Arizona Project WET Programs</b>				
Teachers 790	Adults 4,463	Students 34,676	Instruction Facehours 2,180	
<b>Professional Development</b>				
Workshop	Workshop Hours	Teachers	Students Reached By Teachers	Instruction Facehours
Booth-Fickett Hot Shots	6.5	31	1,300	71.5
Tucson STEM Academy 2013 Follow Up	6.5	12	1,242	13.0
Clean Water Academy	16.0	19	2,007	80.0
STEMAZing Institute	18.0	16	Unknown	90.0
Tucson STEM Academy 2014	40.0	24	2,631	200.0
Other 1-day workshops	52.5	252	9,426	57.5
<b>Totals</b>	<b>139.5</b>	<b>354</b>	<b>16,606</b>	<b>512.0</b>
<b>Direct Student Outreach Programs</b>				
<b>Sweetwater Wetlands</b>				
Schools	Classes	Teachers (555 Adults)	Students	Instruction Facehours
58	152	152	3,351	464.0
<b>Groundwater Model Presentation - 3rd Grade Classrooms</b>				
Schools	Classes	Teachers (141 presentations)	Students	Instruction Facehours
54	153	153	3,419	282.0
<b>Groundwater Model Presentation - 6th Grade Classrooms</b>				
Schools	Classes	Teachers (92 presentations)	Students	Instruction Facehours
19	93	36	2,224	184.0
<b>Groundwater Model Presentation - Other Classrooms</b>				
Schools	Classes	Teachers (5 Presentations)	Students	Instruction Facehours
3	5	5	111	10.0
<b>School Water Audit Program - 180 Aerators Changed</b>				
Schools	Classes	Teachers	Students	Instruction Facehours
6	45	41	941	199.5
<b>Water Festival - Tucson</b>				
Schools	Classes	Teachers (76 Adults)	Students	Instruction Facehours
8	23	23	592	49.5
<b>Water Festival - Sahuarita</b>				
Schools	Classes	Teachers (66 Adults)	Students	Instruction Facehours
4	16	26	444	16.5
<b>Total Schools</b>	<b>Total Classes</b>	<b>Total Teachers</b>	<b>Total Students</b>	<b>Total Facehours</b>
<b>152</b>	<b>487</b>	<b>436</b>	<b>11,082</b>	<b>1205.5</b>
<b>Community Outreach Events</b>				
Number of Events	Hours	Adults	Students	Instruction Facehours
<b>37</b>	<b>25</b>	<b>3,766</b>	<b>6,988</b>	<b>462.0</b>

Figure 1

2013-14 School Year Summary			
Arizona Project WET Programs			
School Water Audit Program			
School	# Students Participated	# Aerators Replaced	Projected Water Savings (gals/yr)
Canyon del Oro High School	62	50	122,958
Mountain View High School	14	22	90,882
Esperero Canyon Middle School	76	22	74,930
Hendricks Elementary School	65	21	114,909
Booth-Fickett K-8 School	664	40	179,139
Richardson Elementary School	60	25	91,892
<b>Totals</b>	<b>941</b>	<b>180</b>	<b>674,709</b>
Projected Water Savings in yellow are estimated - school did not provide data			
Water Scene Investigation			
School	# Students Participated	# Students Reporting Data	Projected Water Savings (gals/yr)
Canyon del Oro High School	70	15	199,406
Esperero Canyon Middle School	230	3	32,850
Hendricks Elementary School	65	0	N/A
Imago Dei Middle School	18	18	234,330
Utterback Middle School	110	51	316,029
STEMAZing Workshop	16	15	22,747
<b>Totals</b>	<b>509</b>	<b>102</b>	<b>805,362</b>
Projected Water Savings are reported data only - Actual Projected Water Savings would be much higher			
Drinking Water Chemistry Kits			
School	Grade Level	# Classes	# Students Participated
Patagonia High School	11	1	21
Esperero Canyon Middle School	8	2	55
Quail Run Elementary	6	2	35
CDO High School	9, 10	2	70
Doolen Middle School	6	1	1
<b>Totals</b>		<b>8</b>	<b>182</b>
Materials Distributed at Outreach Events			
Shower Timers			975
Sweetwater Wetlands Guides			657
Tucson Toolkit Booklets			566
Stormwater in the Desert Booklets			19
Faucet Aerators & Flow Bags (1 gpm)			786
<b>Totals</b>			<b>3,003</b>

Figure 2

# Tucson Water Education Program

**Professional Development**  
\* 354 Teachers



**Instruction**  
\* 2,172 Facehours

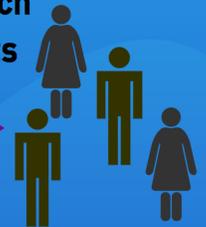


**Student-Driven  
Projected Water Savings**  
\* 1,480,071 Gallons/Year



**Instructional Impact**  
\* 16,606 students

**Public Outreach**  
\* 4,463 Adults



**Direct Instruction**  
\* 18,070 Students  
\* 439 Teachers



Figure 3

## I. Summary

Arizona Project WET (APW) entered into a new 3-year Intergovernmental Agreement (IGA) on July 1, 2013 to enhance the ability of teachers to instruct students, and students to learn about local issues pertaining to water. The Work Program defined in the IGA encompasses three educational areas: professional development, student educational programs, and community outreach event coverage.

Professional development includes STEM Academies and workshops to support curriculum integration. APW also works with district specialists to develop and provide professional development necessary for teachers to evolve instructional practices for 21<sup>st</sup> Century Learning. Partnerships with other organizations increase the breadth of offerings, and extend APW's exemplary professional development and education to a wider audience.

Student educational programs include: 3<sup>rd</sup> grade groundwater flow model presentations, 3<sup>rd</sup> grade Sweetwater Water Festivals, 6<sup>th</sup> grade groundwater flow model presentations, school and home water audits in middle and high school, and community water festivals for 4<sup>th</sup> grade students. Community outreach events include Tucson's multi-day Funfest and Festival of Books as well as single day family science events at various venues.

**In fiscal year 2013-14, Arizona Project WET provided direct instruction to 18,070 students, their 439 teachers, and 4,463 adults. Student-driven School Water Audits and Water Scene Investigations resulted in a projected water savings of 1,480,071 gallons/year. A record, 354 teachers engaged in professional development that evolved their content knowledge, instructional practices and ability to use technology to engage the 16,606 students they report teaching annually. These accomplishments were a result of direct instruction totaling 2,172 facehours.** A facehour is defined as an hour where an APW educator is directly involved in educating students, teachers and adults.

Professional development offerings in Tucson increased this fiscal year, providing 18 days of workshops for a total of 354 teachers. These offerings are critical for educators as analyzed by the National Academies' Committee on Integrated STEM Education, "Apart from subject-specific content knowledge, the ability and confidence to teach across subjects will be critical for educators called upon to deliver integrated K-12 STEM education. Educators will need to know how to provide instructional supports that help students recognize connections between disciplines, and they will need to support students' developing proficiency in individual subjects in ways that complement students' learning through integrated activities" (National Academies Press, 2014, *STEM Integration in K-12 Education: Status, Prospects, and an Agenda for Research*, p.7). APW worked with curriculum specialists to assess district and school needs and leveraged resources from Tucson Water and other partners to provide professional development for educators that focused on the necessary instructional practices to deliver integrated STEM education.

Outcomes and impacts of APW Programs are outlined in the following pages.

## II. Professional Development

Arizona Project WET Teacher Academies offer professional development that evolves teachers' instructional practice and water-related content mastery through STEM integration, real-world and relevant application, and collaborative work. APW provides teachers with the support needed to adopt instructional practices that encourage students to apply their learning to develop ideas, design solutions and deliver positive change. **Arizona Project WET provided 139.5 hours of training to 354 teachers. These teachers reported reaching 16,606 students annually.**

At the end of APW multi-day academies, teachers often exuberantly express amazement at how much they learned and accomplished. Teacher content knowledge is a key factor in producing positive student outcomes as determined by the Committee on Integrated STEM Education, "The expertise of educators working in classrooms and in after-/out-of school settings is a key factor—some would say the key factor—in determining whether integrated STEM education can be done in ways that produce positive outcomes for students. One limiting factor to teacher effectiveness and self-efficacy is teachers' content knowledge in the subjects being taught." (National Academies Press, 2014, *STEM Integration in K-12 Education: Status, Prospects, and an Agenda for Research*, p.7) APW measured large increases in teachers' mastery of the content in all workshop offerings. These increases are highlighted in all of the multi-day academies described in this report.

### *Tucson STEM Academy*

2014 marks the second year that Arizona Project WET has partnered with Tucson Water to offer the Tucson STEM Academy, which immerses educators into real-world STEM applications. This year it was a 5-day workshop attended by twenty-four 6<sup>th</sup> – 12<sup>th</sup> grade teachers. Teachers engaged in hands-on Project WET and locally developed lessons centered on Tucson Water's operations. Field studies were provided to the Reclaimed Water facilities, Hayden Udall Water Treatment Plan, and a city park for an irrigation audit. Guest speakers from Tucson Water delivered presentations on Tucson Waters' overall water supply and distribution system. Teachers throughout the week were taught to utilize and apply a myriad of technology tools. Each day teachers created PREZI slides to summarize their learning and over the course of the week they built an online presentation that they could use to engage their students. They were presented on the last day of the academy.

**The teachers' level of understanding in all content areas of the workshop increased. The average pre-workshop level of understanding of the content was 3.88, compared to a post workshop average level of 7.81 on a scale of 1-10. This is an increase in understanding of 50.3% over the 5 days.** Individual gains for each content area are outlined in the following graphs.

Teachers valued this workshop. At the end of days 1 through 4 teachers were asked to rate activities and presentations for that day. All days and items received positive responses. At the conclusion of all APW academies and workshops, teachers evaluate the overall effectiveness of the professional development in 12 areas, in order to ensure that it is of the highest quality. **There was an overwhelming positive response at the conclusion of this workshop. One hundred percent of the teachers positively "Agreed" or "Strongly agreed" to almost all of the statements regarding the utility and efficacy of the professional development experience. Ninety-six percent of the teachers positively responded that, "This workshop was excellent – one of the best I have ever attended."** The least favorable statement with 92% positive responses was, "The facilities and amenities (setting, breaks, etc.) were suitable for the purposes of the workshop." Hearing the presenter during the chemistry tests at Hayden-Udall was extremely difficult and most of the teachers were kept very busy learning new technology throughout the workshop.

## Day 1 Tucson STEM Academy 2014

### *Tucson's Urban Water Cycle*

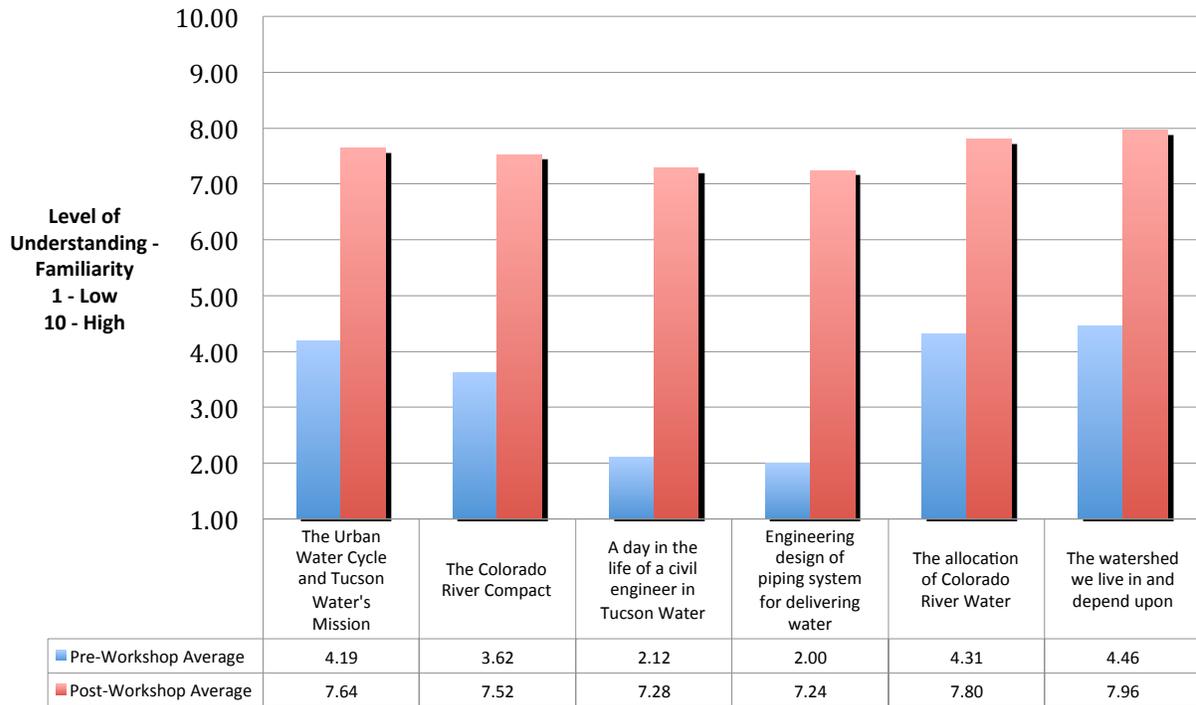


Figure 4

## Day 2 Tucson STEM Academy 2014

### *Reclaimed Water System*

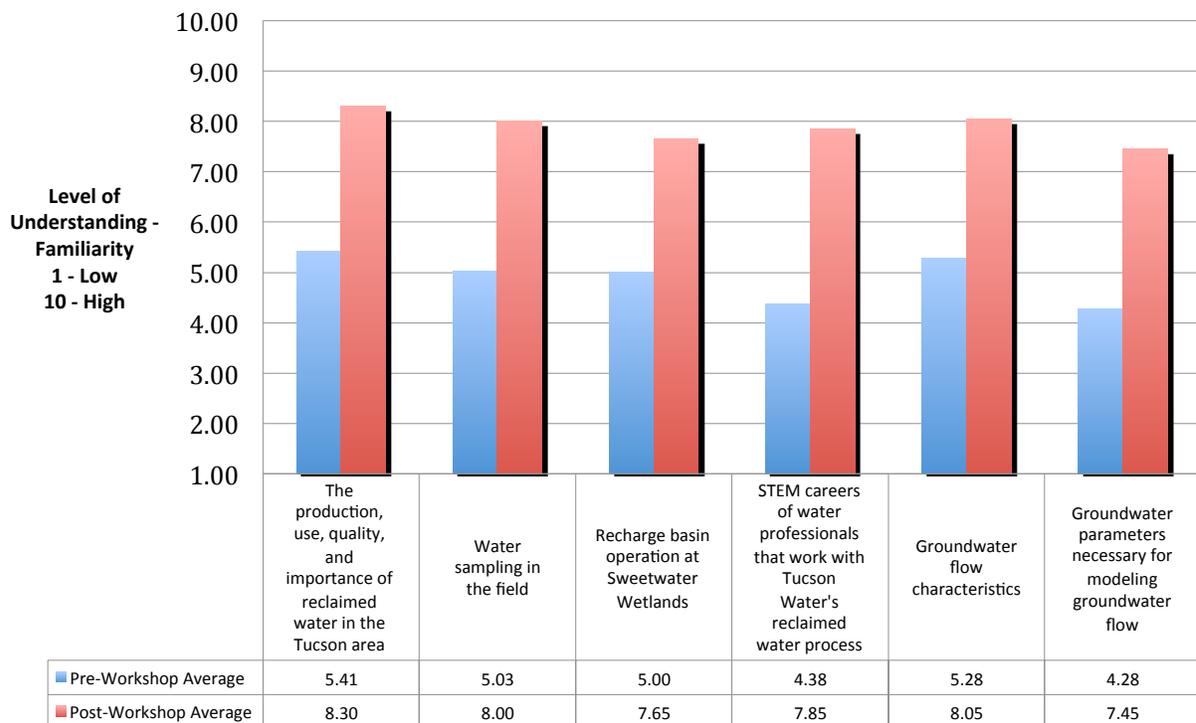


Figure 5

### Day 3 Tucson STEM Academy 2014 Water Quality

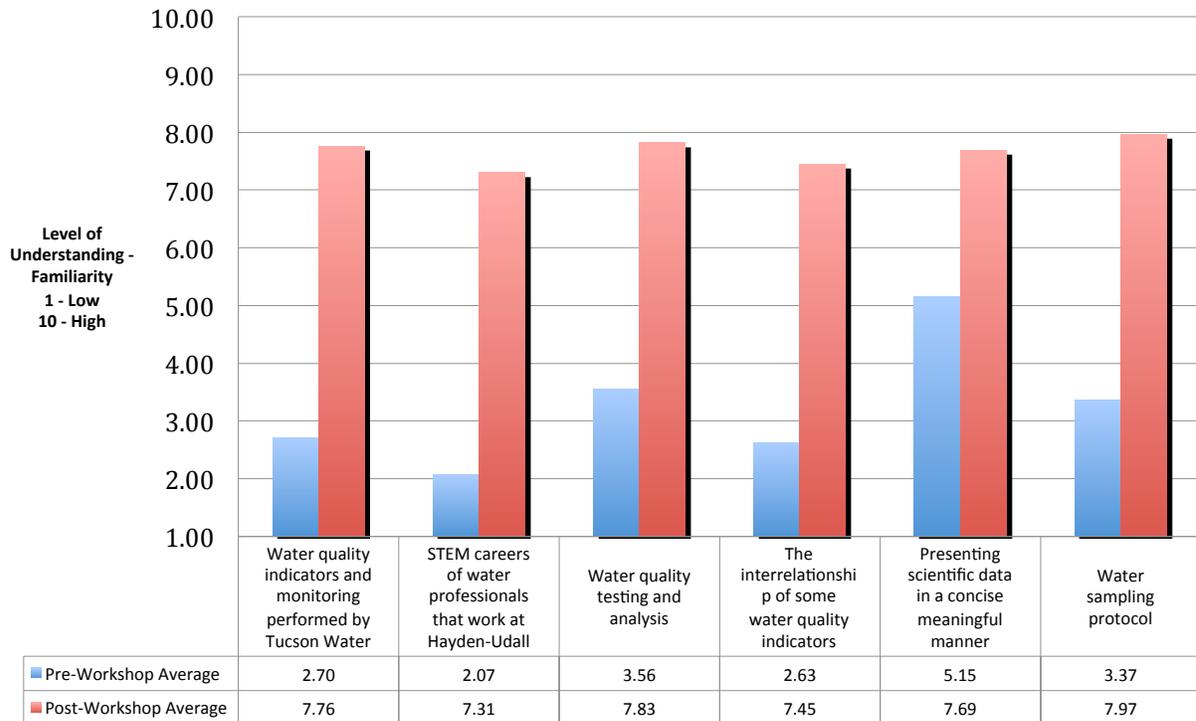


Figure 6

### Day 4 Tucson STEM Academy 2014 Water Conservation

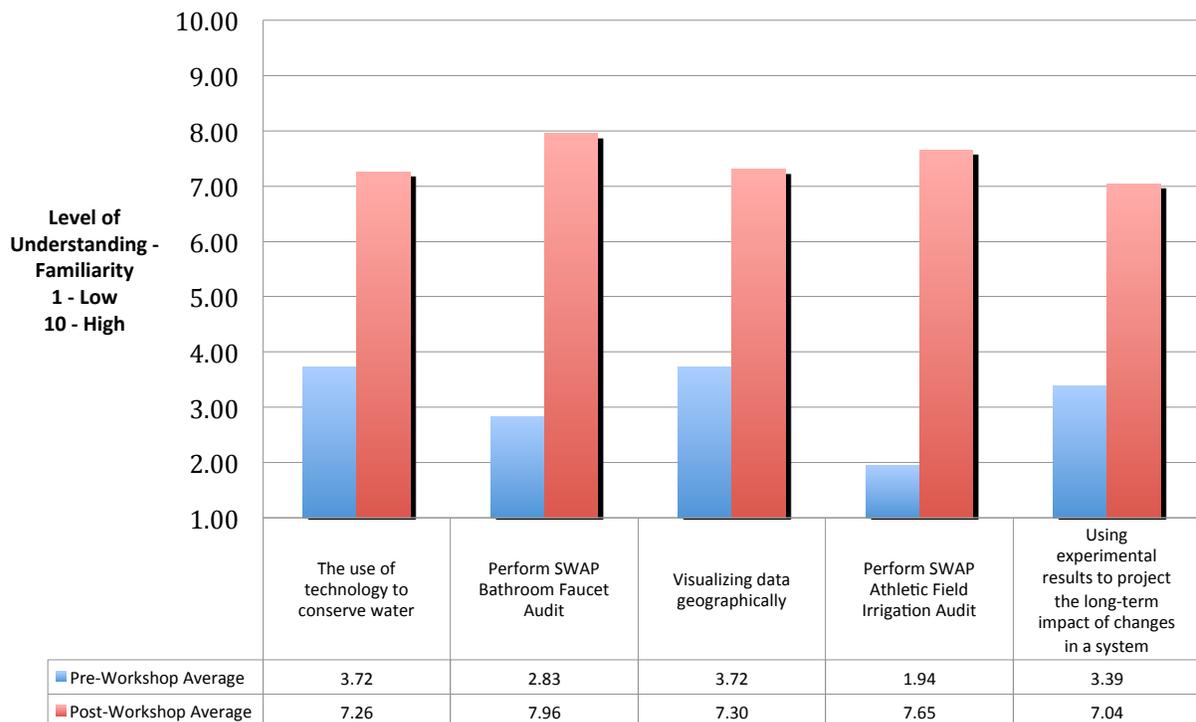


Figure 7

## Day 5 Tucson STEM Academy 2014 Engineering Design and Product Presentation

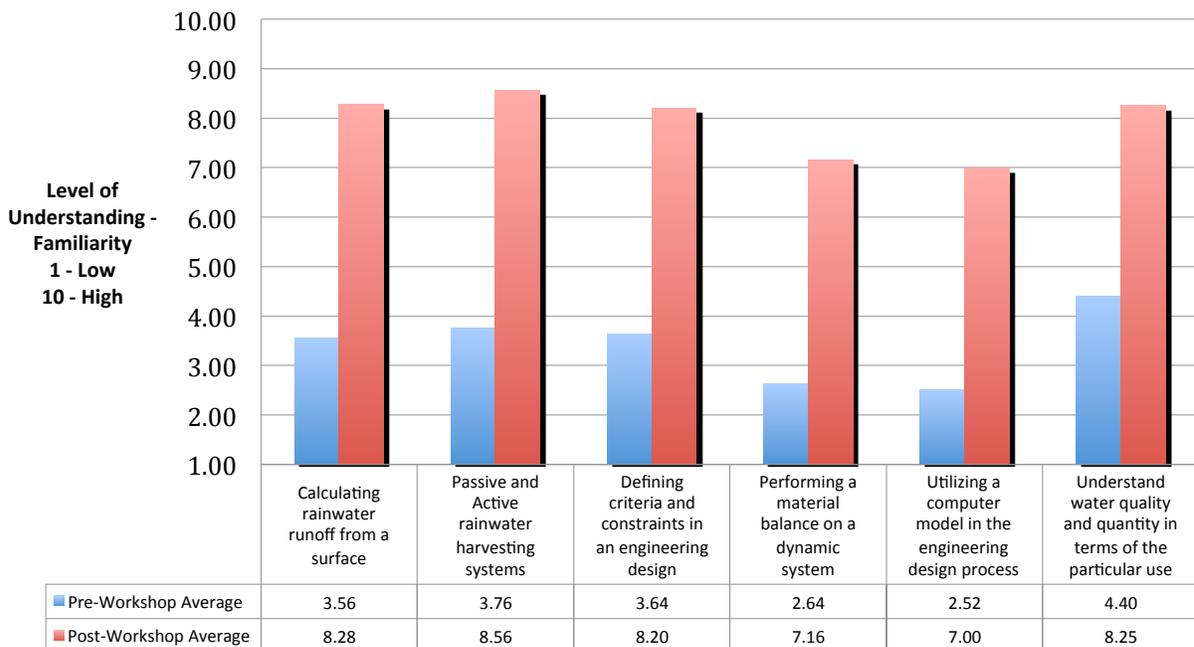


Figure 8

## Technology Questions Tucson STEM Academy 2014

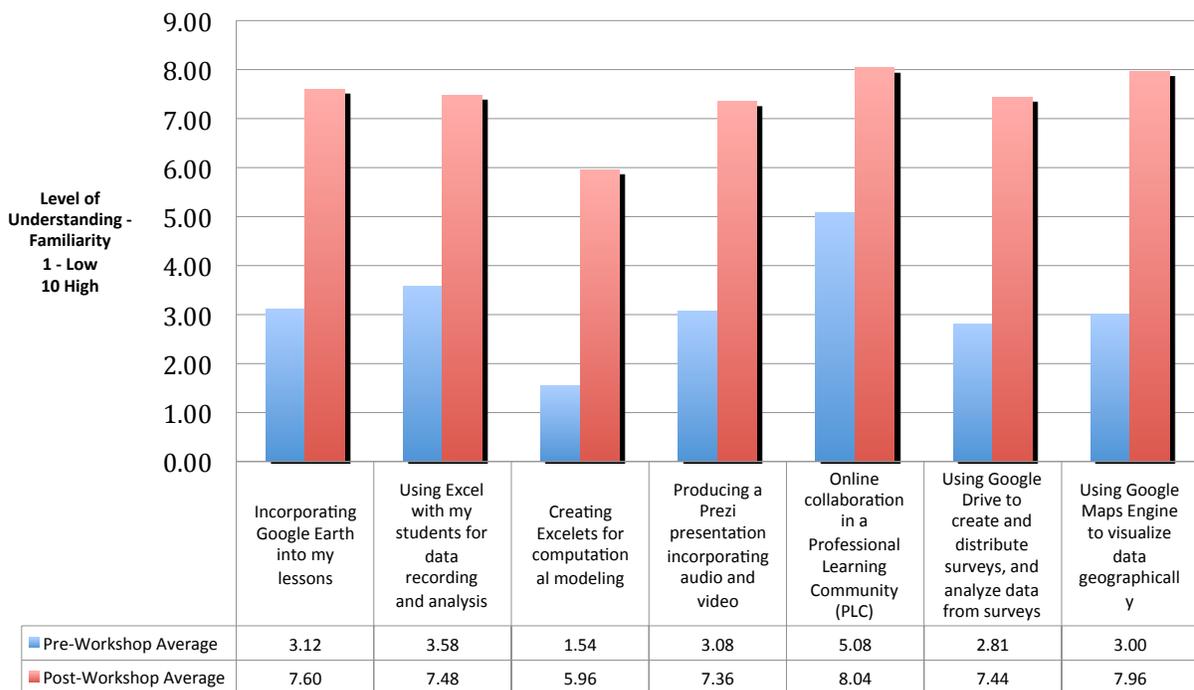


Figure 9

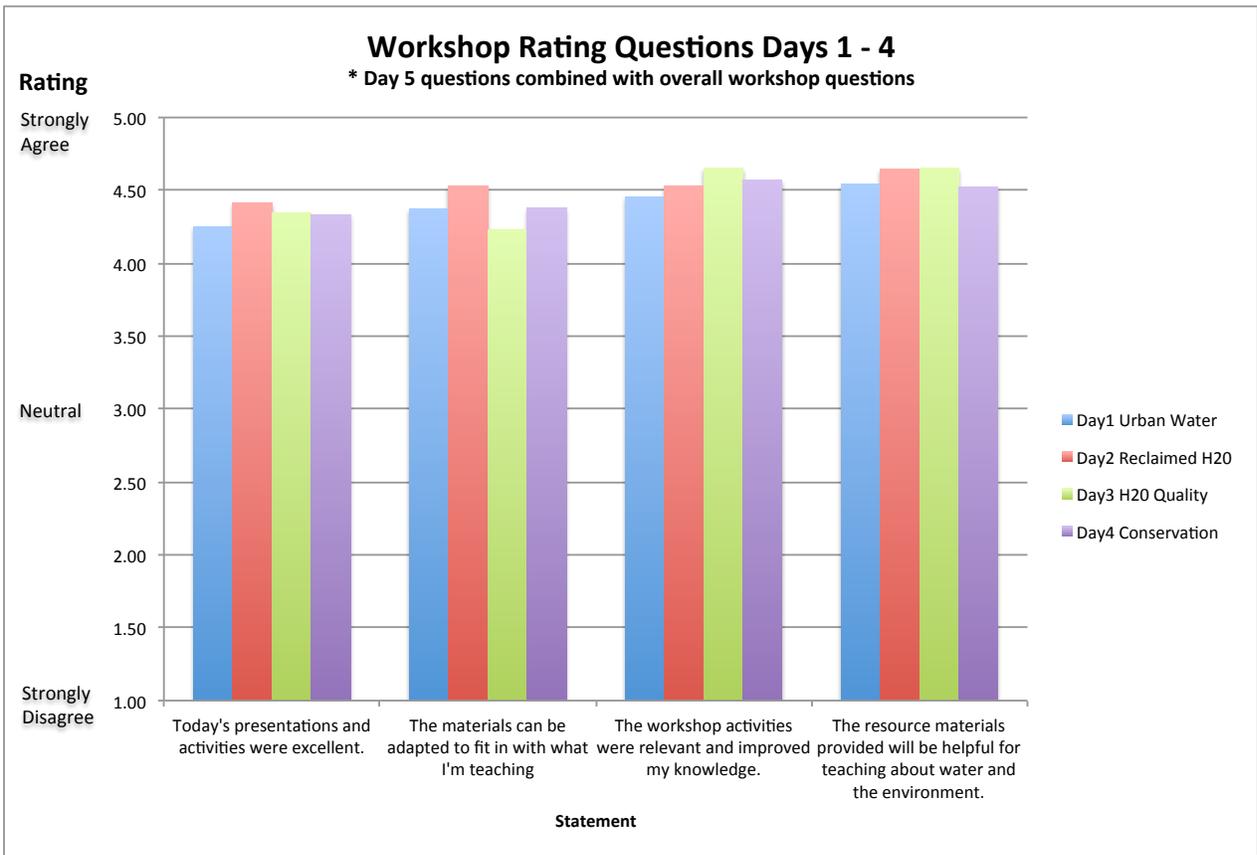


Figure 10

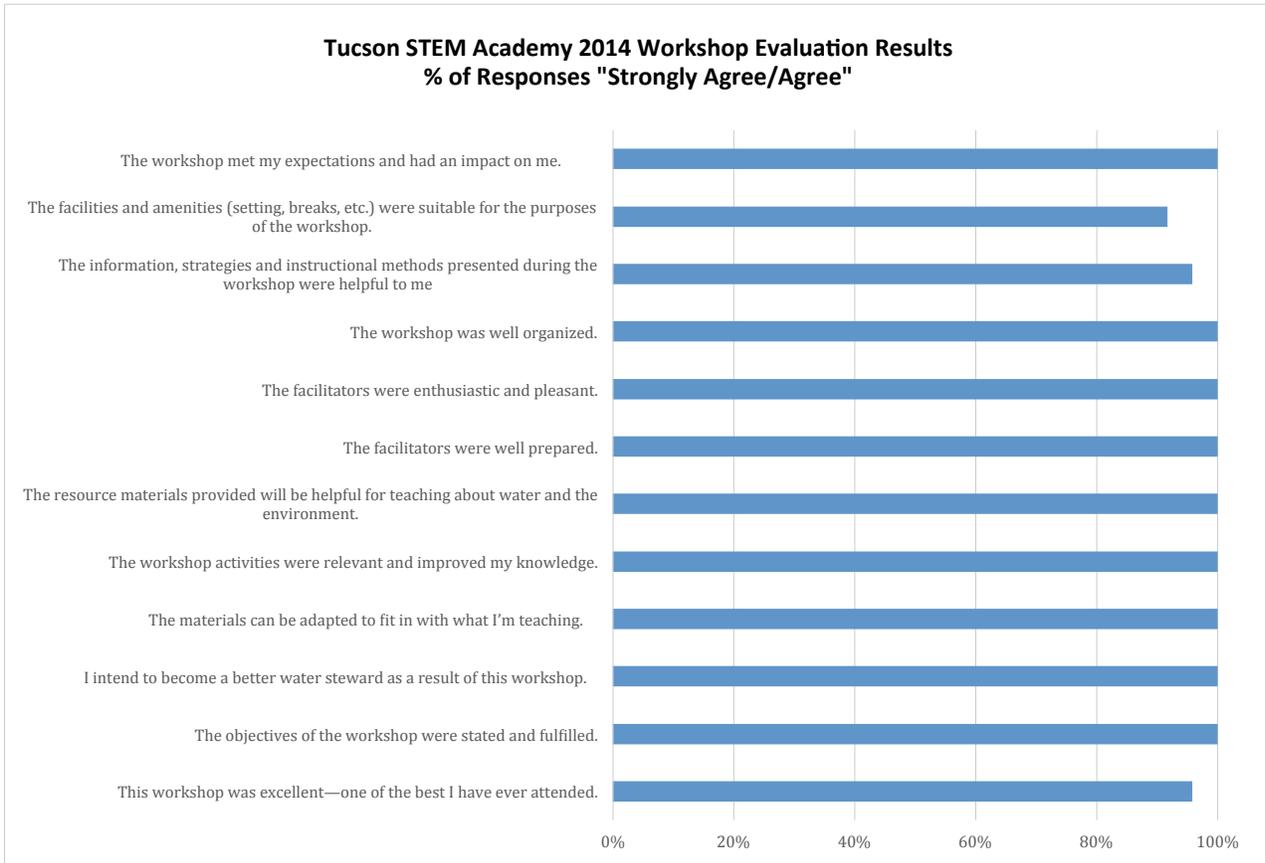


Figure 11

The Tucson STEM Academy extends professional development beyond the week of the academy. Throughout the year APW supports academy teachers in implementing new instructional practices and curriculum. APW water educators provide presentations and assist students in water audits. Teachers collaborate utilizing the online Google Community. **APW supplied 8 classrooms with Drinking Water Test Kits reaching a reported 182 students.**

In February 2014, 12 of the 25 Tucson STEM Academy 2013 participants returned for the follow up workshop. Teachers presented the various instructional units that they implemented in their classrooms as a result of their participation in the academy. The projects, although diverse in scope, all demonstrated student engagement in critical thinking. **The teachers valued the workshop, and 90% of the teachers Agreed/Strongly Agreed that, "Time to collaborate with fellow to teachers to share ideas, lessons, successes and obstacles was helpful to me."** One teacher commented, "I am very happy with everything I have incorporated into my classes and owe it all to the STEM Academy and Arizona Project Wet."

The follow up workshop for the 2014 Academy is scheduled for April 25, 2015.

### III. Partnerships

Arizona Project WET leveraged partnerships with other organizations to offer a variety of academies, workshops and student instruction.

#### *Academies*

Partnerships play a key role in developing and implementing multi-day teacher academies. Two new academies, Clean Water and STEMAZing Institute were a result of newly formed APW partnerships.

#### *Clean Water Academy*

This 2-day workshop in collaboration with Pima Association of Governments and Tucson Water focused on wastewater treatment, stormwater management, groundwater pollution, water remediation and emerging contaminants. Nineteen 4<sup>th</sup> – 12<sup>th</sup> grade teachers participated in hands-on Project WET lessons, and tours of Agua Nueva Water Reclamation Facility and the University of Arizona Laboratory for Emerging Contaminants. Guest speakers from Marana Stormwater Management and Tucson Water provided additional real world content.

**The teachers' level of mastery in each of the topics covered increased from a 4.66 pre-workshop average to a 7.97 post-workshop average on a scale of 1-10. This is an increase of 41.4% over the 2 days. One hundred percent of the teachers positively evaluated the professional development experience in all 12 areas with either "Agree" or "Strongly Agree."**

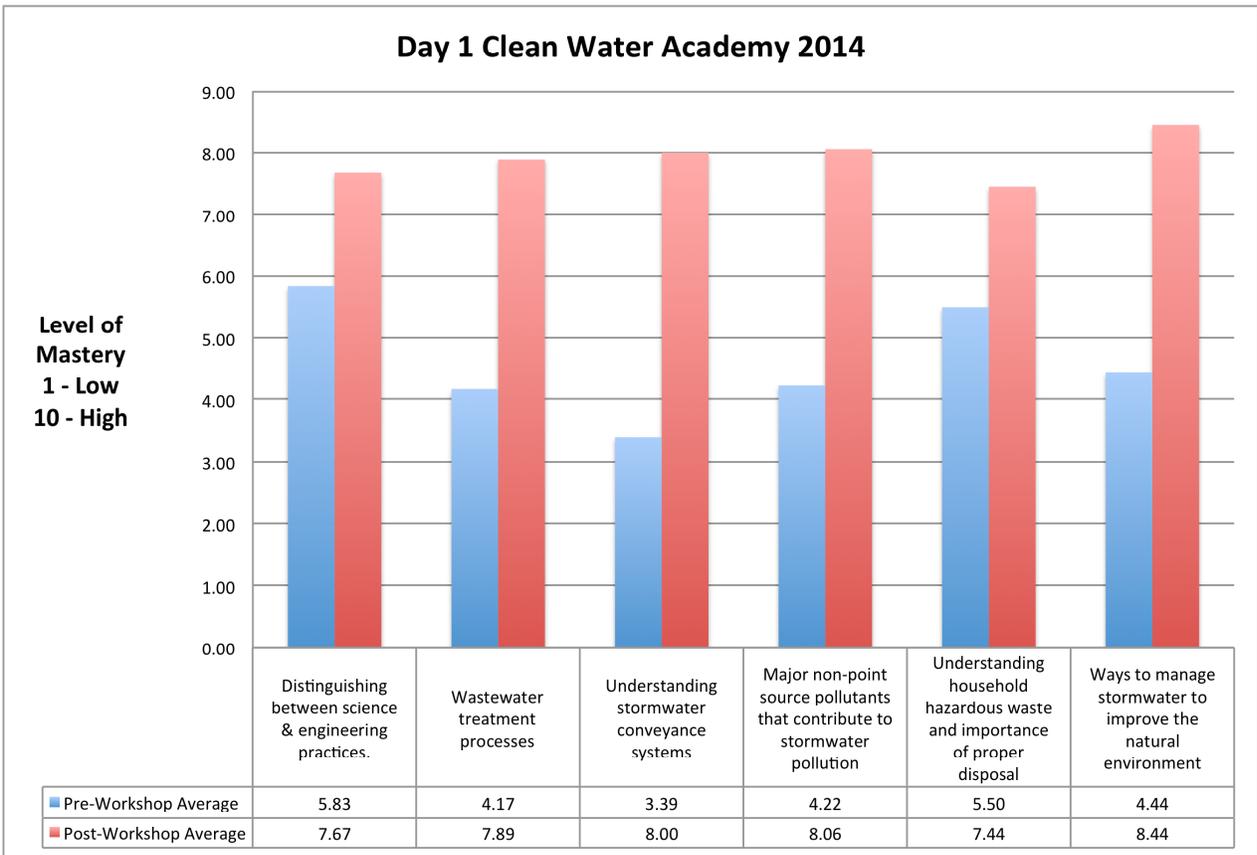


Figure 12

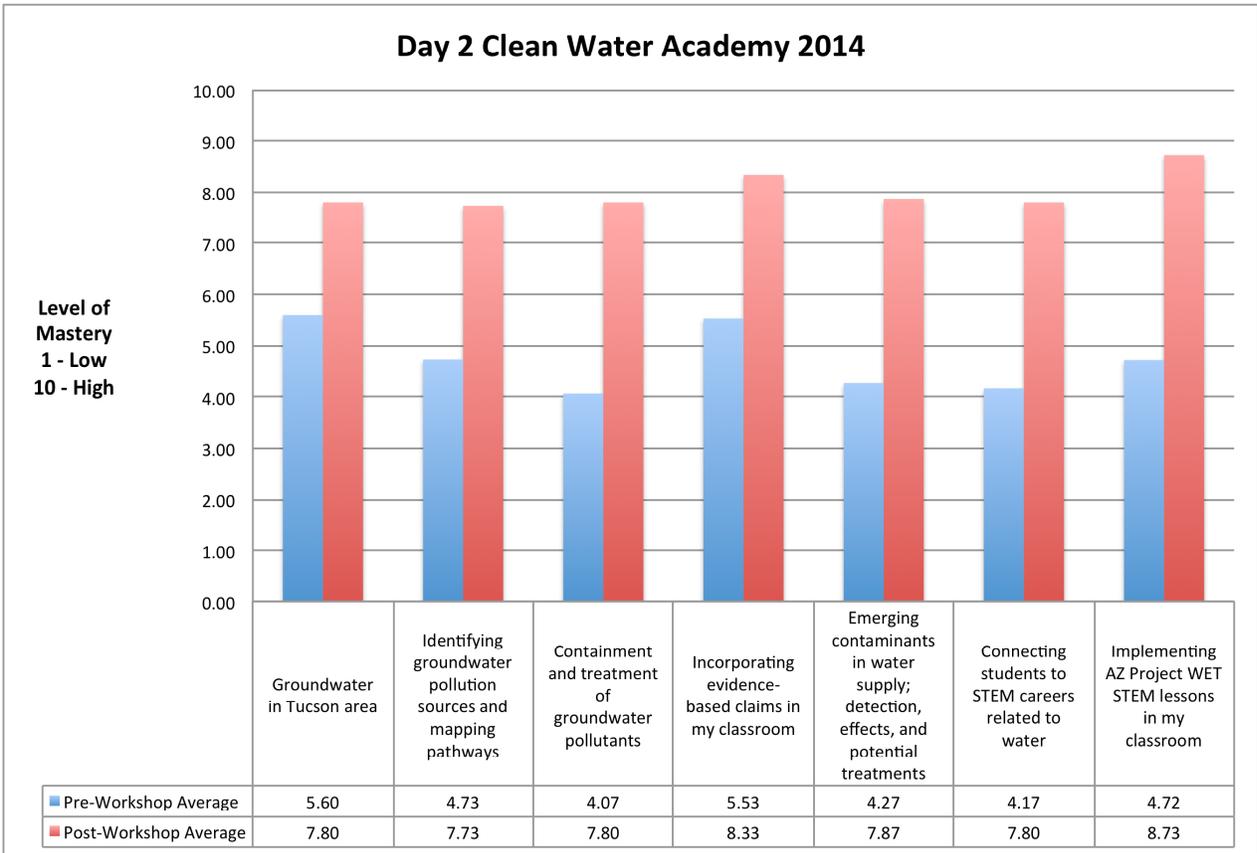


Figure 13

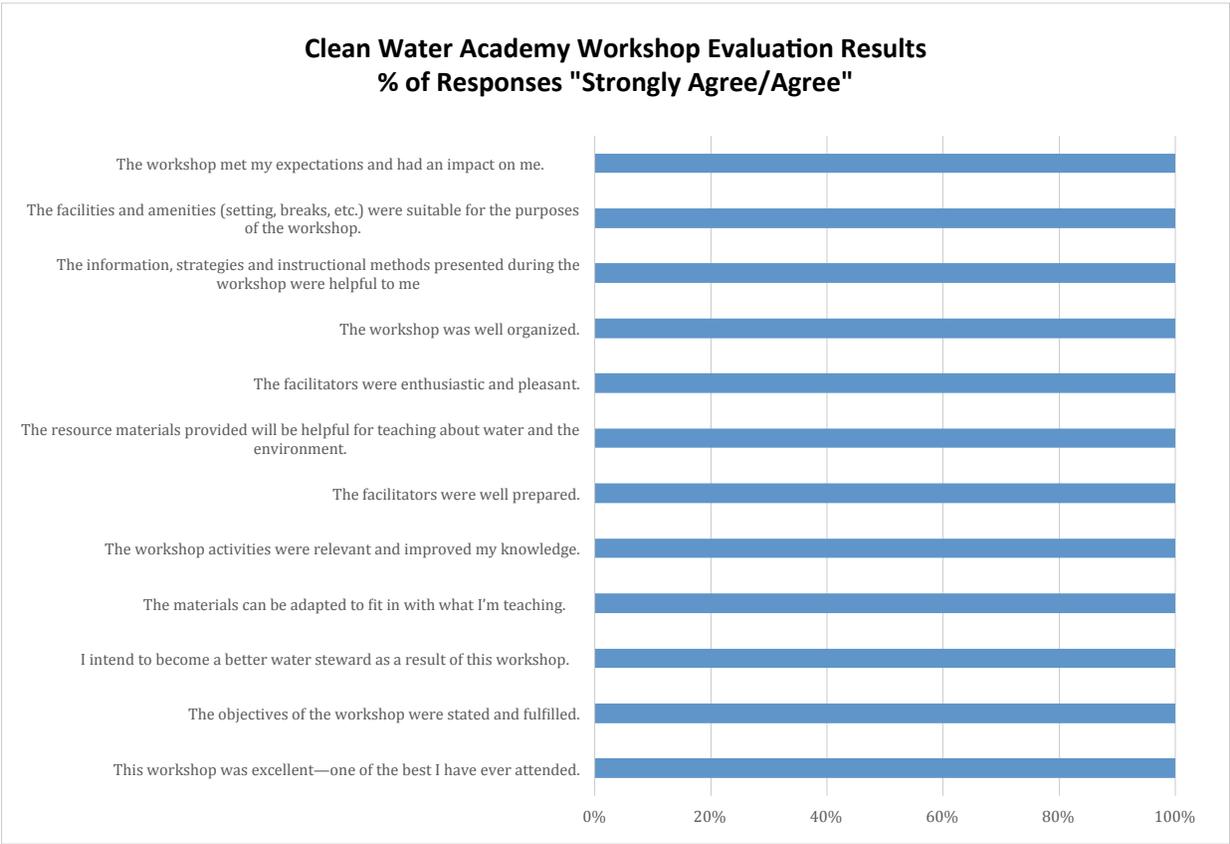


Figure 14

**STEMAZing Institute**

Arizona Project WET in partnership with the USA National Phenology Network provided one strand of the 6 offered at of this 3-day STEMAZing Institute hosted by the Office of the Pima County School Superintendent. The strand, “Real-World Projects: Connecting Students to Their Local Environment with Data Driven Projects,” focused on water availability for plants, animals and humans. Sixteen pre-school through high school teachers learned how to incorporate real world observations and data in order to answer student-driven research questions.

**The teachers’ level of mastery in all the topics increased from a pre-workshop average of 4.04 to a post workshop average of 8.22 on a scale of 1-10. This is an increase of 50.8% over the 3 days.** Workshop satisfaction as measured by the Office of the Pima County School Superintendent showed 100% of the teachers rated the workshop outstanding/above average in 5 out of 6 areas as outlined in the graph below. Eighty percent of the teachers felt they, “Were provided opportunities to apply learning to my personal context.”

## STEMAZing Workshop Content

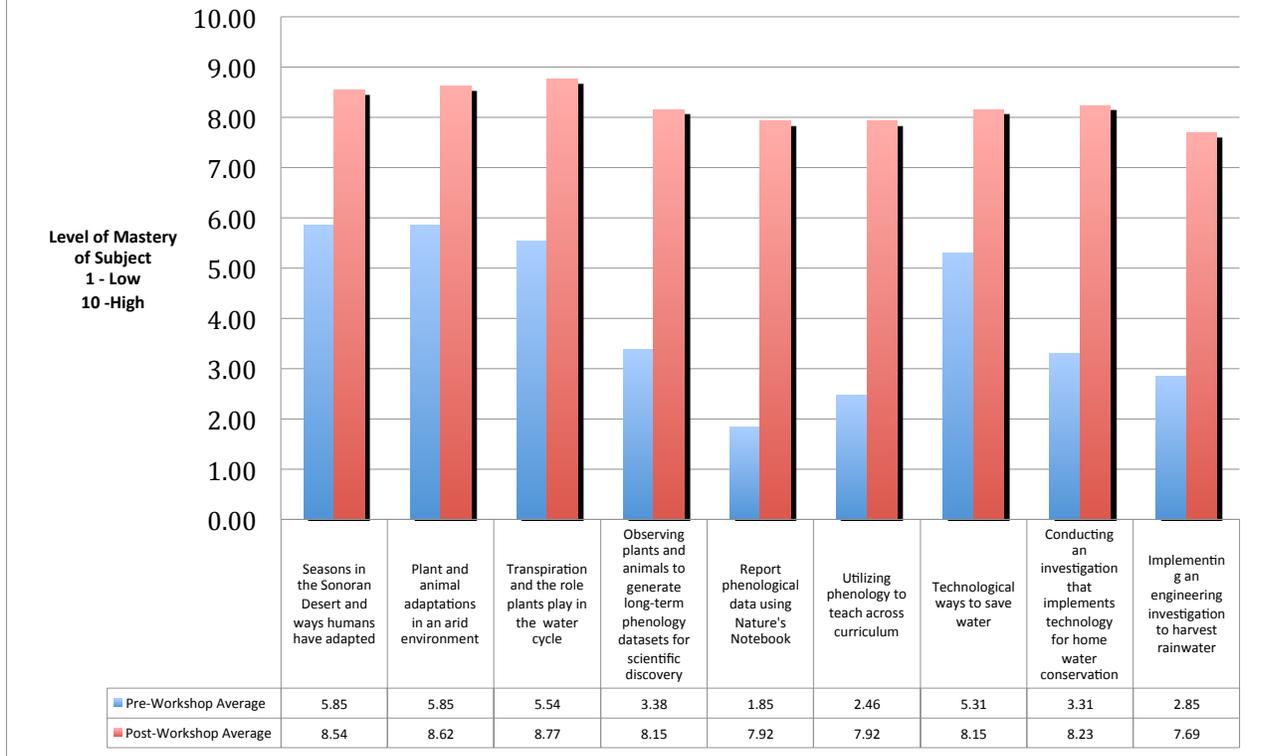


Figure 15

## STEMAZing Institute Workshop Evaluation Results % of Responses "Outstanding" / "Above Average"

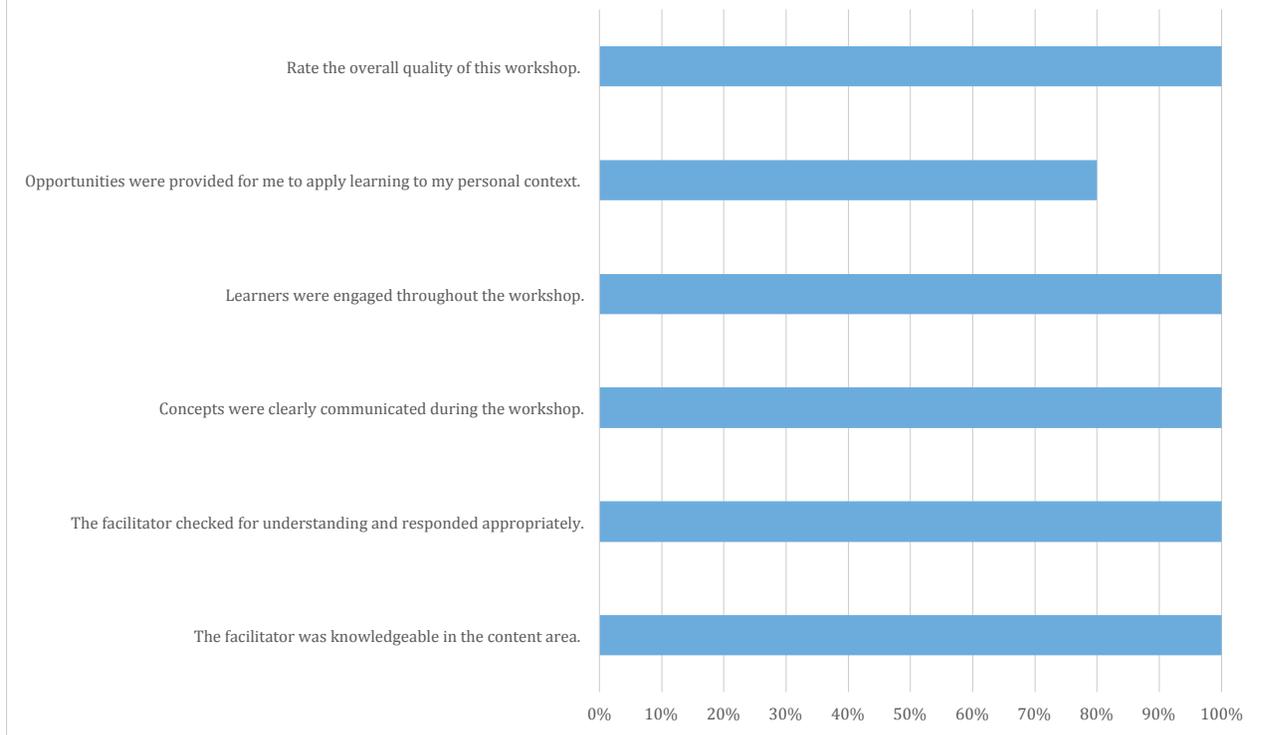


Figure 16

## Workshops

Workshops are categorized as professional development offerings of one day or less. The workshops discussed in this section are a result of collaborations with other organizations.

APW joined forces with TUSD to train 3<sup>rd</sup> grade teachers in the use of the APW-adapted Water FOSS kit which is one third of the science curriculum for that grade level. **The two 7-hour workshops were rated highly by the 30 teachers who reported reaching 611 students. One teacher commented, "Excellent -- I feel prepared for the water kit now. Thanks!"**

In partnership with Biosphere 2, APW facilitates one day of the two weeklong Arizona Center for STEM Teachers Summer Institute. One-day teacher workshops for the 2013 and 2014 Summer Institutes were provided this fiscal year. The July 2013 workshop engaged 41 intermediate schoolteachers, who report teaching 2,154 students, in water education focused on the Institute theme of energy. In June 2014, another 39 teachers that report teaching 2,641 students were involved in a workshop focusing on STEM education in the primary grades. **The teachers' level of mastery in each of the topics covered during the 2013 workshop increased from a 2.55 pre-workshop average to a 7.67 post-workshop average on a scale of 1-10. This is an increase of 66.7%.** Evaluation results for 2014 are not yet compiled.

The Earth Camp program at the Arizona-Sonora Desert Museum (ASDM), another APW partnership that also includes the Planetary Science Institute and University of Arizona College of Science, has been offered for the past six years. Teacher professional development was included for three years, and a 1-day workshop was provided in November that reached 8 teachers and the 842 students they teach. **In the teacher evaluation of the professional development, 95.5% agreed/strongly agreed that, "This workshop was excellent-one of the best I have ever attended."**

APW's ongoing collaboration with Arizona Hydrological Society enabled teachers to attend professional development that included interaction with water professionals at their Annual Symposium. **The 18 teachers, that reported reaching 1,878 students annually, rated the workshop highly. One teacher commented, "This was my first Arizona Project WET workshop and I loved it. This was great being able to be a part of the AHS conference and then incorporating it for teaching."**

The Blue Marble Institute's Champions for Change (C4C) program provides educators with tools and resources to inspire students to engage in projects to create positive change in their communities. Jane Poynter, former Biospherian and chairwoman/president of Paragon Space Development Corporation, wrote the C4C book that links athletic champions with environmental change projects. APW's School Water Audit Program, Water Scene Investigations Program and a developing rainwater harvesting program are programs designed to help students make these positive changes. **APW and C4C joined forces at the Arizona Science Teachers Association Conference to engage 13 teachers in 3 hours of professional development.** One teacher commented that he liked, "It's ability (the program) to have students do their own research at their own school."

Booth-Fickett Math/Science K-8 Magnet School requested that APW deliver school-wide professional development focused on STEM. Two 1-hour trainings involved the entire K-8 staff, 67 educators, reaching 1300 students. They were introduced to the C4C program, and provided with hands-on instruction in the use of technology tools in the classroom. An all-day Saturday workshop attended by 31 teachers, focused on the School Water Audit Program. They implemented a school audit with their students following the training. **Teachers reported a level of mastery increase in the topics covered during the all-day workshop from a 3.03 pre-workshop average to a 7.97 post-workshop average on a scale of 1-10. This is an increase of 62.0%.**

## *Student Instruction*

Partnerships also resulted in direct student instruction. C4C approached APW to assist Imago Dei Middle School with a student-driven rainwater-harvesting project. APW worked with a Watershed Management Group volunteer to develop and present rainwater-harvesting instruction that engages students in the engineering design process. APW also received a \$1000 grant through the National Girls Collaborative Program to purchase supplies to be used in rain barrel harvesting projects at schools. Installation of the system at Imago Dei and other schools is planned for the 2014 fall semester.

APW participated in engaging 12 middle school students in learning about the earth in both the natural and built environments in this summer's Earth Camp in partnership with the Arizona-Sonora Desert Museum. This experience had a profound effect on the students. In a final survey, 100% agreed/strongly agreed that, "...because of Earth Camp, I intend to work harder to conserve nature and reduce my eco-footprint". The experience also had academic impacts on the students. On other survey statements, 91.7% of the students said they were more motivated to do well in their science classes, and 83.3% said they were more interested in STEM careers.

## **IV. Student Educational Programs**

Student educational programs as outlined in the IGA include groundwater flow model presentations, Sweetwater Wetlands water festivals, school water audits, and community water festivals.

### *3<sup>rd</sup> Grade Groundwater*

A one-hour classroom presentation facilitated by APW Water Educators is an integral part of the APW-FOSS Water Unit. The in-classroom presentation is supported by pre- and post-instruction. Groundwater is the least understood and least taught part of the water cycle. The interactive classroom presentation ensures that students understand that: groundwater is a system within the water cycle, water is between the grains of sand and gravel, groundwater moves because of gravity, and groundwater is important because it is part our water supply. Lesson scripts are available upon request. **APW-trained Water Educators conducted 141 in-classroom presentations for 3,419 3<sup>rd</sup> grade students and 153 teachers.**

The pre- and post-assessment consisted of a ten true or false questions, and was administered prior to the presentation and revisited following the lesson. The assessment covers the main ideas of the lesson and addresses common misconceptions. Overall, student understanding improved by 12.15%. The largest gains were in understanding that groundwater can be pumped from underground, water moves faster through gravel than sand, groundwater is an important source of drinking water, and groundwater is not in a large lake underground. These gains ranged from a 29.47% improvement to an 11.30% improvement. All of these concepts can be attributed directly to the interactive nature of the lesson using the groundwater model and earth material tubes. Students observe water moving through the groundwater model, time the movement of the water through different materials, and pump water out of the ground. The statement that students struggled with the most was, "Water in a lake can never move into the groundwater." This saw a 2.22% decrease in correct responses. The confusion may arise from the hidden artesian spring in the model filling the lake. It was also an area that 3<sup>rd</sup> grade students struggled with last year. Lesson modifications will address this concern for next school year.

## Groundwater Assessment - 3rd Grade

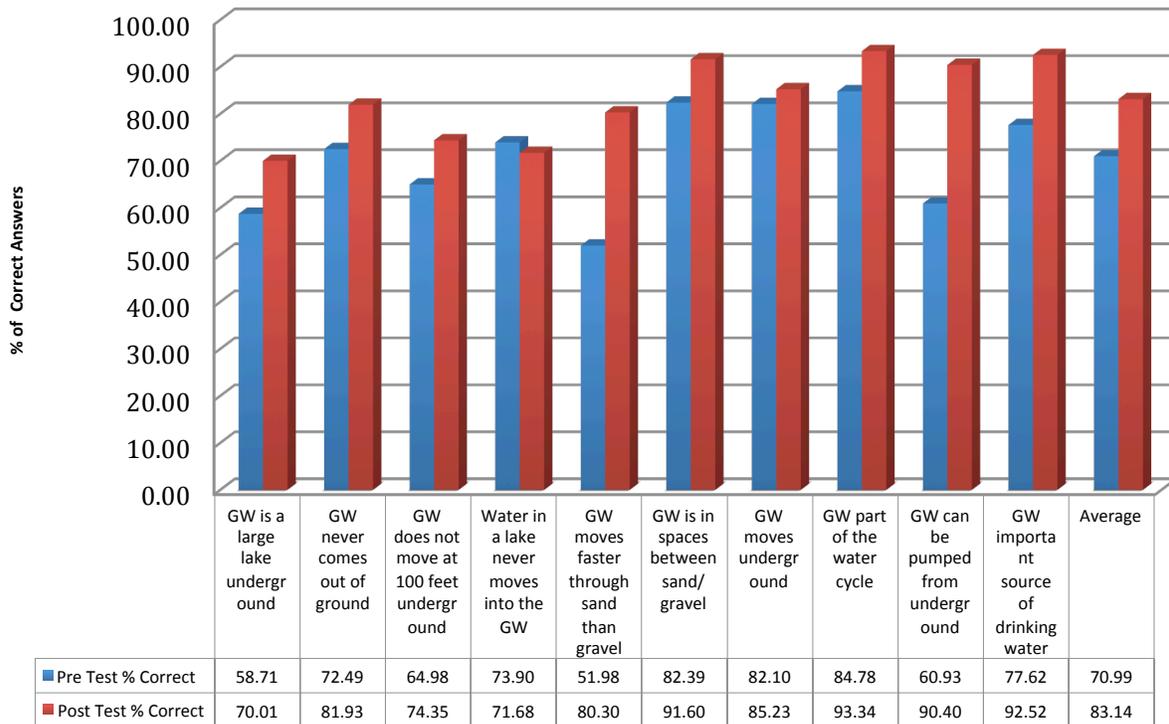


Figure 17

### 3<sup>rd</sup> Grade Sweetwater Wetlands Water Festival

The Sweetwater Wetlands Water Festival is an event designed to synthesize students' conceptual understanding of the APW-FOSS Water Unit and is written into the curriculum. **The Sweetwater Festival instructed 3,351 third grade students in 152 classes along with their teachers and an additional 555 parents during the 58 field trips.** The Sweetwater Festival consists of lessons on the Water Cycle, Water Conservation and Watersheds, which have been adapted from the Arizona Water Festival model. In the fourth lesson, Tucson students tour the wetland and try to understand its' importance.

Teachers administer pre-assessments to students prior to their Sweetwater visit. The pre-assessments are provided to teachers when APW educators come in to deliver the groundwater flow model presentation. The corresponding post-assessment was administered during the festival after each lesson. Each evaluation booklet contains five identical questions, one of which is a writing prompt designed to ascertain students' feelings about being at the wetland. The remaining four questions evaluated students' understanding of a watershed, water conservation actions, the water cycle (Incredible Journey), and the role of the Sweetwater Wetlands in Tucson's urban water cycle (Wetland Explorers). **Overall student learning increased 27.56% as measured by the percentage of correct responses in the pre- and post-assessments.** The largest gain of 33.16% was in understanding that water exists in many different forms as it moves through different places in the earth system. Students act as water molecules in the Incredible Journey lesson, leading them to a deeper understanding of the water cycle.

## Sweetwater Wetlands Assessment

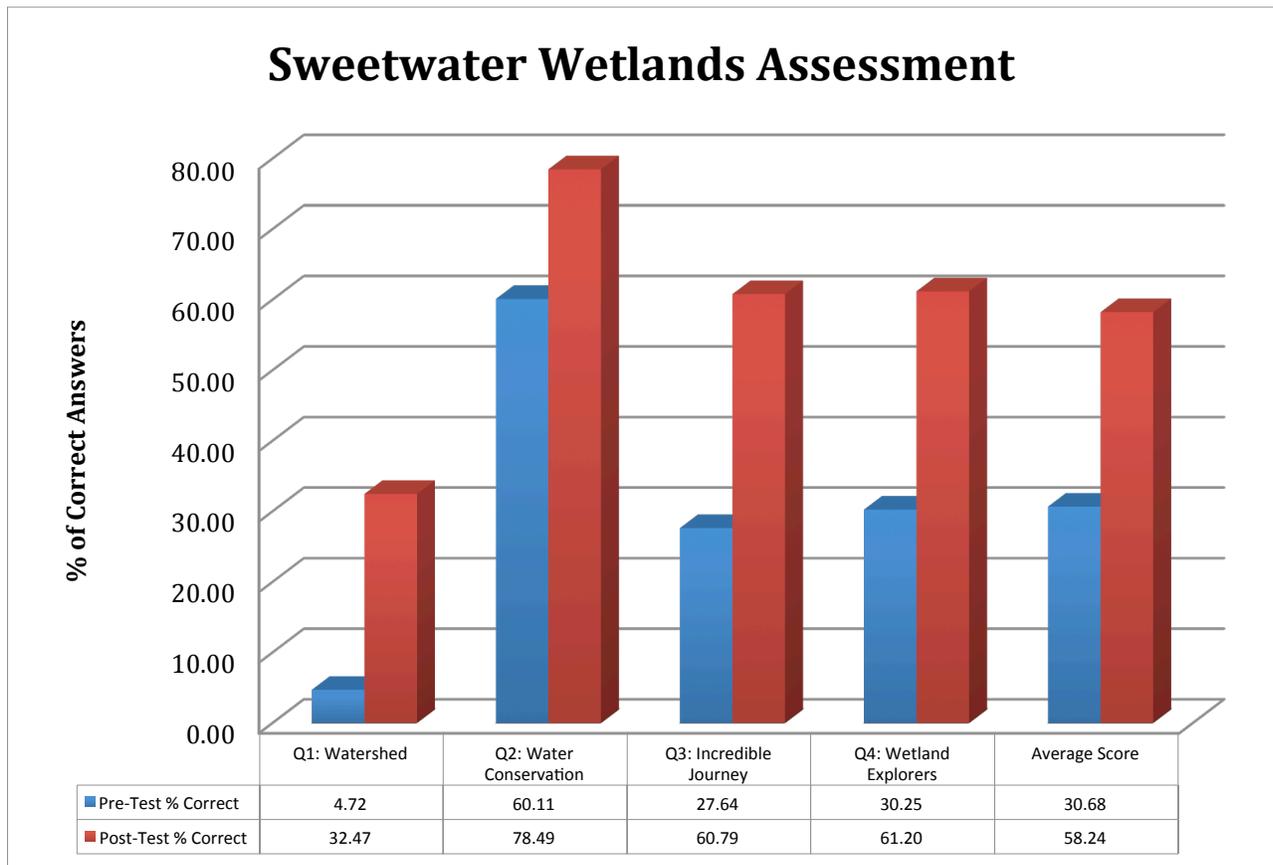


Figure 18

### 6<sup>th</sup> Grade Groundwater

Sixth grade Arizona Science Standards incorporate Earth Science and water concepts into the curriculum. APW Water Educators provide a 1-hour groundwater presentation to 6<sup>th</sup> grade classrooms as part of their science curriculum. Groundwater is the least understood and least taught part of the hydrologic cycle. The classroom presentation connects them to this part of the water cycle by emphasizing that: an aquifer is a groundwater system within the water cycle, water moves between grains of sand and gravel, and groundwater is an important part of our water supply. **APW Water Educators facilitated 92 classroom presentations, reaching 2,224 students and 36 teachers in 19 schools throughout Tucson.**

The pre- and post-assessment for 6<sup>th</sup> grade is an open-ended written evaluation that requires students to explain the four most important things they know about the groundwater system. Points were awarded when students explained that groundwater: is under the ground, is in between the grains of sand and gravel (pore spaces), moves due to gravity, is connected to the surface (pumping, percolation), is part of the water cycle, and is important because we use it. **The students averaged a 20.32% increase in overall learning**, while their understanding that groundwater is in the pore spaces increased 40.68%. Unfortunately, the thinking and writing required in this assessment doesn't always get the necessary time and attention required to adequately complete it. This assessment is being redesigned to account for time restrictions and better assess student learning for next year.

## Groundwater Assessment - 6th Grade

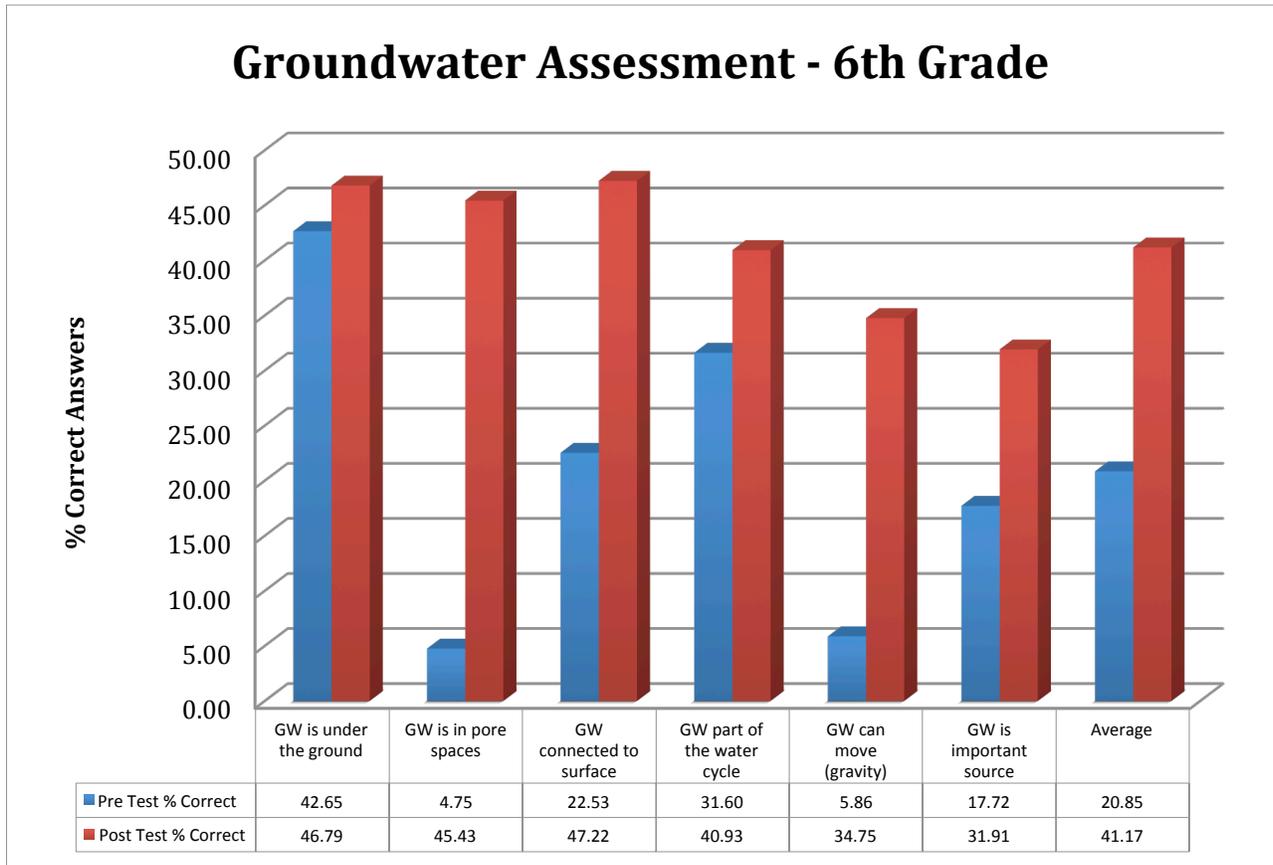


Figure 19

### Groundwater Summary

**Five additional groundwater presentations were provided to 111 students this year at the high school level and above.** There were three high school and two Pima College presentations that were requested. Two of the presentations were for the students of high school teacher participants in the 2013 Tucson STEM Academy.

Due to a new online curriculum adoption, Sunnyside Unified School District declined all of APW's attempts to provide them with classroom presentations and Sweetwater Wetlands Water Festivals. All of their science content was to be taught within the language arts curriculum through the online Discovery Education Techbook. APW will try to reconnect in the coming school year.

An interactive summary of the distribution across Tucson of all APW presentations is available on Google Maps at: <http://goo.gl/y1hzDa>. A screenshot of the map is provided in Figure 20.

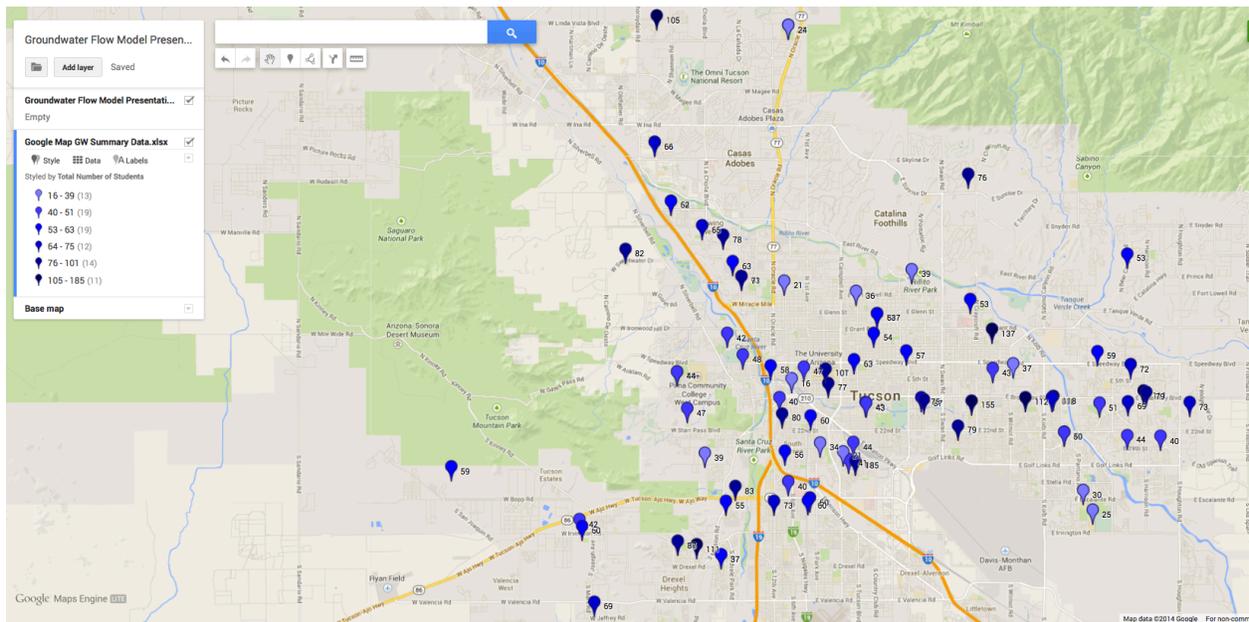


Figure 20

## Water Conservation - School Water Audit Program & Water Scene Investigation

The School Water Audit Program (SWAP) is a real-world and relevant STEM education program. Through the application of science and mathematics, students investigate and quantify water use at school. They study technological ways to reduce water use and install water efficient fixtures. **APW Water Educators assisted 911 students at 6 schools over 14 days to perform indoor bathroom faucet audits. One hundred eighty aerators were replaced for a projected water savings of 674,709 gallons/year.** The actual water savings may be much higher, since three of the schools did not return their calculated savings. We will continue to work with the teachers to ensure that they are able to complete the water savings computations with their students.

The Water Scene Investigation (WSI) offers students an opportunity to apply their learning and skills regarding water audits and water efficient technology at home. They utilize math skills by measuring water flow before and after the installation of new faucet aerators in their own homes, estimating usage and then calculating annual water savings. **This year APW facilitated the WSI curriculum at five schools and one teacher workshop for a total of 509 participants. A projected Water Savings of 805,362 gallons/year was reported by 102 participants on APW's website [http://arizonawet.arizona.edu/wsi/water\\_savings](http://arizonawet.arizona.edu/wsi/water_savings).** The actual water savings are higher, because many people did not report data online.

## Water Festivals

The Tucson Water Festival and Sahuarita Water Festival involved school districts not served by the Sweetwater Wetlands Water Festivals. **Eight schools from Amphitheater School District and Sonoran Science Academy participated in the Tucson Festival at James Kreigh Park in Oro Valley on April 17<sup>th</sup>. APW staff and 28 volunteers educated 592 students from 23 classrooms. Seventeen teachers participated in the 1-day professional development workshop associated with this festival. On May 16<sup>th</sup> APW staff and 25 volunteers educated 444 students from 16 classrooms in Sahuarita Unified School District during the water festival there. Prior to the festival, 16 teachers engaged in 1-day of professional development.** Teachers administer pre- and post-assessments for the Water Festival consisting of a variety of questions designed to evaluate students' conceptual understanding of water concepts. **Students made gains**

in understanding in all areas. The average gain was 21%, and the largest gain of 29% was on the concept that groundwater is an important resource.

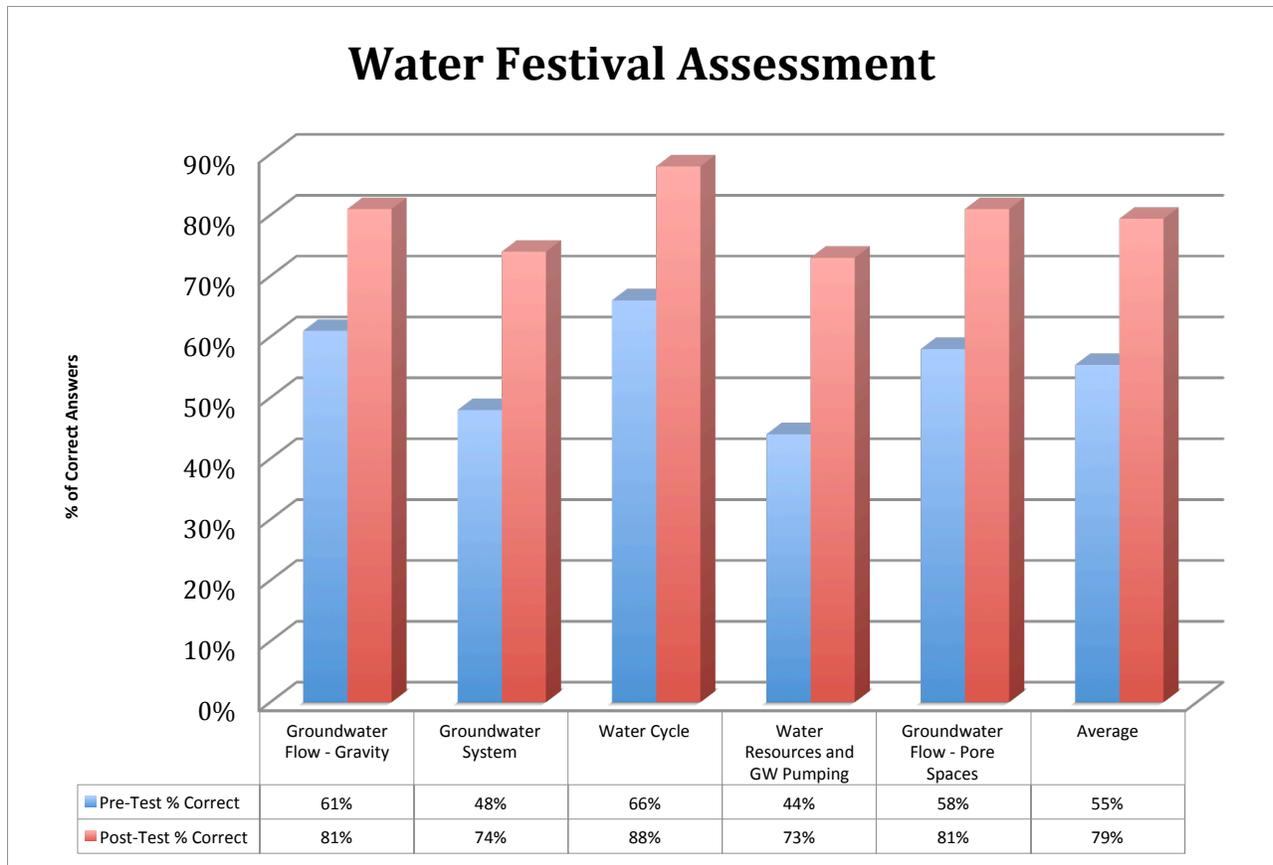


Figure 21

## V. Community Outreach

**Arizona Project WET provided coverage for Tucson Water at 37 events reaching 3,766 adults and 6,988 students.** This year APW worked with Tucson Water to devise a way to perform an accurate count of attendees that participated in APW activities at large community events. APW water educators counted out giveaways provided to attendees and utilized a hand-held counter. Large multi-day events included Tucson FunFest and Science City at the Tucson Festival of Books. Family science days/nights at the Tucson Children’s Museum, Biosphere 2 and local schools were also included. Interactive lessons for children and youth were provided at all of the events along with water conservation information for adults. APW also provided a 3-hour training to docents at Tohono Chul Park. The importance of APW’s community outreach efforts is highlighted in one docent’s comments, “This was an eye opening class. It wouldn't hurt to require every person who uses water to learn a little about water conservation.” **A total of 3,003 Tucson Water promotional items were distributed at events (See Figure 2: 2013-14 School Year Summary).**

## VI. Conclusion

Education is the first step toward responsible water stewardship in the Tucson community. With the new Tucson IGA, APW has developed new targeted programs and expanded and improved existing ones; helping to ensure that Tucson remains hydroliterate and conservation savvy.

## **Appendix D – EEEExchange 2013-14 Annual Report**

(Included as a pdf report)

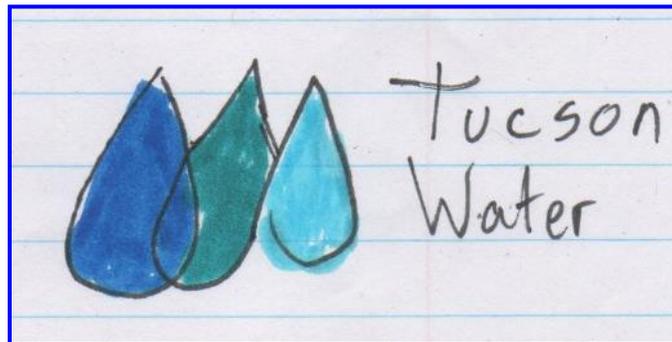


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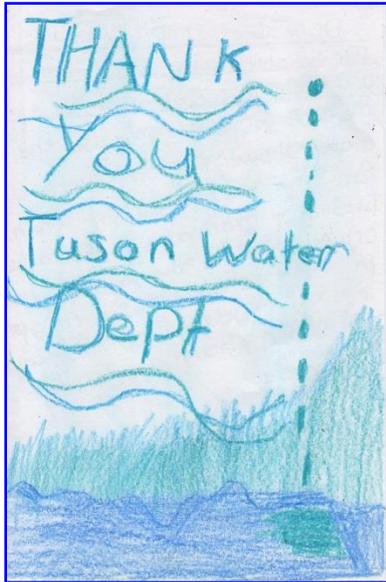
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## I. Program History

The Environmental Education Exchange in close partnership with Tucson Water has developed and continues to manage three water conservation education programs for Tucson Water. Together, the programs reach over 13,000 students annually in grades one through eight in multiple school districts throughout the Tucson Basin.



Originally Tucson Water commissioned the EEExchange to develop an outreach program that would bring hands-on activities to fourth and fifth grade classrooms. In 1993, the Exchange developed *Our Water, Our Future*, a two-part program consisting of five teacher-led activities followed by an interactive 90-minute presentation from an outreach educator. Now an hour-long presentation, *Our Water, Our Future* has reached over 2,200 classrooms, and is now an institution for many local fourth and fifth grade teachers.

In addition to developing *Our Water, Our Future*, the Exchange also manages the program. This entails contacting teachers, scheduling programs, revising curriculum activities, hiring and training presenters, maintaining equipment, conducting ongoing evaluation of the program, and otherwise coordinating this outreach effort. The on-site presentation is offered by a lively "Doctor Faucet" character and includes graphics, activities with a specially customized groundwater model, an overview of the water treatment process, ideas for water conservation, and complementary shower timers for each student. *Our Water, Our Future* was revised for the start of the 2013-2014 school year, with changes to the pre- and post-visit lessons, as well as to the on-site presentation. An exciting addition to *Our Water, Our Future* is a full-color activity book given to each student at the end of the presentation.

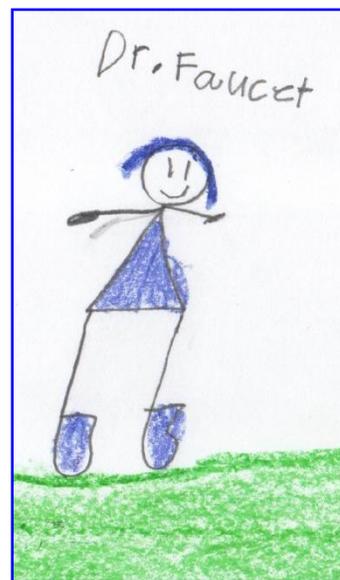
In 1998, the EEExchange developed and began to manage a new Tucson Water education program that was targeted primarily for first through third grade audiences. The Water Info Van Program, which begins with a short video, soon became known as *Da Drops* in honor of the animated talking water drops that take students on a journey beginning in the clouds and ending in the kitchen sink. The presentation focuses on groundwater model activities in which students experience changes in how people have used water over time. Working with another customized groundwater model students first retrieve water with miniature buckets from the Santa Cruz River and later pump water through modern wells at a rapid rate. This teaching tool clearly demonstrates the connection between Tucson's growing population, diminishing underground water supply, new sources of water from the Colorado River and reclaimed water, and the importance of helping to conserve water on a daily basis. At the end of this hour-long program, the presenter passes out student activity booklets and a friendly cup for each student that encourages them to "*Brush Up With Just One*

*Cup! Da Drops* has reached over 83,000 students and has also become an institution for many local first through third grade teachers.

As an outgrowth of these highly successful elementary school programs, Tucson Water contracted the Exchange to develop and manage a middle school water education program as well.

In the year 2000, the Exchange produced the *Tucson Toolkit: Perspectives on Our Water*, a five-unit curriculum developed for middle school science teachers to integrate into their lesson plans. The *Tucson Toolkit* contains nine engaging hands-on activities such as collecting transpiration from leaves, constructing a miniature Mount Lemmon, and building a model to investigate groundwater contamination. In the culminating activity, after the class has learned why water is such a precious and limited resource in southern Arizona, students measure the flow rate of their showerheads at home.

Those who report high flow rates receive a water-saving showerhead. The *Tucson Toolkit* differs from the other programs in that no presenter visits the classroom and all of the activities are led by the classroom teacher. All students receive a workbook, shower timer and flow rate measurement bag. Because the *Tucson Toolkit* materials have become dated, and there was a desire to have a middle school on-site classroom presentation, the *Toolkit* will no longer be offered after this school year (although parts of it will be incorporated in to the new program).



During 2013-2014, *El Tour de Agua*, a new middle school program including an on-site classroom presentation, was developed. The program focuses on water sources, water recycling, and water conservation. Students are taught to question if their water sources are reliable, safe and sustainable. The classroom presentation is approximately one hour in length and uses a Prezi media format rather than posters, for a more exciting and interactive learning experience. Teachers show a pre-visit PowerPoint presentation to their students for background information (with a related Student Study Guide), and follow up with a post-visit lesson on water conservation (using the Shower Flow Kit materials that are student give-aways). *El Tour de Agua* was piloted to 50 classrooms in April and May 2014.

These educational programs are currently managed by the Environmental Education Exchange, on behalf of Tucson Water, and are offered free of charge to local teachers and students.

## II. 2013-2014 School Year Overview

### Students and Classes Reached

During the 2013-2014 school year, Dr. Faucet and *Da Drops* visited approximately 7,415 students in 293 first, second, and third grade classrooms in 87 different schools. Through the *Our Water, Our Future* program, Dr. Faucet visited 4,443 students in 170 fourth and fifth grade classes in 54 schools. *Da Drops* and *Our Water, Our Future* were presented in 93 different schools in eight school districts, as well as seven charter schools and two private schools. Although EExchange was initially budgeted for 450 classroom presentations, an additional 13 presentations were scheduled (more could have been scheduled, but presenters were limited because they were busy with the *El Tour de Agua* pilot). The middle school curriculum, the *Tucson Toolkit*, was taught to a total of 515 students by 8 teachers from 4 schools representing two school districts. In addition, the new middle school program, *El Tour de Agua*, was piloted to 1,443 students at 50 schools, representing 25 teachers at 11 schools in 5 districts. Refer to [Appendices A-H](#) for details about school districts, schools and numbers of students reached.

#### Da Drops 2013-2014 Totals:

Presentations – 293

Students Reached – 7,415

#### Our Water, Our Future 2013-2014 Totals:

Presentations – 170

Students Reached – 4,443

#### Tucson Toolkit 2013-2014 Totals:

Teachers Participating – 8

Students Reached – 515

#### El Tour de Agua Pilot Spring 2013 Totals:

Presentations - 50

Students Reached – 1,443

In addition, the following special events were attended by a presenter with the *Da Drops* kit: Discovery Night at Biosphere 2 on October 19, 2013; Envision Tucson Sustainable Festival at Reid Park on October 20, 2013; Math, Science and Technology Funfest at TCC on November 7 and 8, 2013; and, Family Science Night at Rattlesnake Ridge Elementary School (MUSD) on November 21, 2013. Refer to [Appendix H](#) for details.



Curriculum activities for *Da Drops*, *Our Water, Our Future* and the *Tucson Toolkit* continue to be downloaded from the website. The number of downloads exceeds the number of *Da Drops* and *Our Water, Our Future* presentations, as well as the number of teachers requesting the *Tucson Toolkit*, suggesting that there are teachers interested in the

lessons who have not had classroom presentations or materials delivered. In addition, it is likely that we are reaching teachers beyond the Tucson area via these

on-line curriculum activities. Although pre- and post-visit materials for *El Tour de Agua* were downloadable from a link on the website during April and May 2014, they have not yet been connected to the download counter. After they are revised this summer based on teacher evaluations, the materials will be linked to the download counter for the 2014-2015 school year. Refer to [Appendix A](#) for details.

### Program Highlights

- Evaluations continue to be completed by teachers on-line
- Continued streamlined approach to outreach scheduling with scheduling website
- Presenter training, observation and feedback
- Outreach to new schools not visited in past years
- A revision of *Our Water, Our Future* was completed for the 2013-2014 school year
- A new middle school program, *El Tour de Agua*, was developed during 2013-2014 and piloted in spring 2014

### The Scheduling Website

The scheduling website originally came on-line in mid-September 2003 and was revised in August, 2006 ([www.outreach-scheduling.org](http://www.outreach-scheduling.org)). It continues to be extremely beneficial to teachers, the Outreach Education Coordinator and classroom presenters.

- The scheduling website continues to allow teachers and the Outreach Education Coordinator to easily schedule outreach presentations.
- During the 2013-2014 school year, 71% of *Da Drops* presentations and 51% *Our Water, Our Future* presentations were scheduled by teachers using the website. This not only includes when all presentations for specific dates are scheduled on-line, but also includes when one teacher schedules him/herself and writes an on-line note that other teachers at his/her school should be scheduled as well. These teachers scheduled at their convenience, without having to reach the Outreach Education Coordinator by phone or email. The remainder of the presentations was scheduled primarily by teachers contacting the Outreach Education Coordinator via email (28% for *Da Drops* and 47% for *Our Water, Our Future*) and occasionally by telephone (1% for *Da Drops* and 2% for *Our Water, Our Future*). The Coordinator then enters the information onto the scheduling website. (After initial telephone conversations, schedules are finalized using email.) Over the past years, the number of phone calls has decreased, and this year saw an increase in the number of teachers using the website to schedule *Da Drops* as compared to *Our Water, Our Future*.
- Teachers can download the complete set of curriculum activities for each program, or individual sections. It is extremely rare (no requests at all this year) that a teacher requests a copy sent by mail (thus eliminating hundreds of photocopies and mailings each year).



- Teachers complete evaluations on-line, saving paper and postage. In addition, statistics can easily be calculated using all of the data collected.
- The Outreach Education Coordinator can easily schedule presentations using the website, and keep track of all presentations for the entire school year. The website continues to offer easy access while out of the office. The database of teachers can be used to contact teachers for reminders and announcements.
- School addresses continue to be updated on the scheduling website. As presenters discover new ways to get to a school, or old ways that no longer work, they continue to inform the Outreach Education Coordinator, who updates the site (as well as a separate file that is printed out for each presenter at the beginning of each school year).
- The pdf download counter continues to provide information about the number of downloads for the various curricula available on-line. Refer to [Appendix A](#) for details.
- Presenters continue to obtain their schedules from the website, thus eliminating numerous photocopies of presentation details each month. Directions to schools and roundtrip mileage are also included, as well as a direct link to Google Maps.

### Teacher Evaluation and Feedback

After a presentation is completed, a teacher receives a thank you note via email that contains a link to an on-line evaluation form. The site indicates when that form has been completed, so that the Outreach Education Coordinator can review it. Lots of paper and postage is saved using the on-line method. The on-line site not only stores all of the valuable data, but it also does statistical analysis of the information. If a teacher does not have an email address, he/she can still receive a paper evaluation form. In this extremely rare case, the Coordinator can enter the data herself.

The average evaluation ratings for the on-site programs of *Da Drops* and *Our Water, Our Future* were overwhelmingly “Excellent” and “Good” (96% for *Da Drops* and 93% for *Our Water, Our Future*). The table below shows the average results for the both on-site programs. Data were collected from September 1, 2013 through May 20, 2014.

<i>Da Drops</i> Average Teacher Evaluation Results for On-Site Programs	<i>Our Water, Our Future</i> Average Teacher Evaluation Results for On-Site Programs
Excellent: 76%	Excellent: 76%
Good: 20%	Good: 17%
Fair: <1%	Fair: <1%
Poor: <1%	Poor: 0%
Not Applicable: 3%	Not Applicable: 6%

### III. *Da Drops* Program Summary

2013-2014 was an extremely successful year in the history of the *Da Drops* program, with 293 programs presented (and a waiting list of teachers we were unable to reach). Compared with 2012-2013, there were 32 fewer presentations, with 680 fewer students reached at 9 fewer schools. The slight decrease in the number of *Da Drops* presentations is probably the result of several factors: an increase in the number of *Our Water, Our Future* presentations over the past few years, the addition of *El Tour de Agua* middle school presentations in Spring 2014 (these kept the calendar and presenters busier than usual), a decrease in the number of schools (especially in TUSD because of school closures), and the addition of a new 1<sup>st</sup>-3<sup>rd</sup> grade water program for Oro Valley Water (scheduled instead of *Da Drops*). Approximately 29% of the presentations were given to 1<sup>st</sup> grade classes (up from 22%), 31% to 2<sup>nd</sup> grade classes (up from 27%), 34% to 3<sup>rd</sup> grade classes (down from 44%), and 6% to other classes (multi-age) (down from 7%). Refer to [Appendices A-D](#) for details about school districts, schools and numbers of students reached by the *Da Drops* program.

*Da Drops* pre/post-visit activities are being downloaded by more than just the teachers having on-site presentations. The complete set of activities was downloaded 349 times during the 2013-2014 school year (September 1, 2013-May 20, 2014), with individual sections downloaded between 241 and 442 times, so we know that many teachers are aware of these materials on-line, and are possibly even using them outside of the Tucson area. Refer to [Appendix A](#) for details.

#### Partnership with Project WET

At the beginning of the 2013-2014 school year, Project WET informed the EEExchange that they would be scheduling Sweetwater Wetlands field trips for 3<sup>rd</sup> grade on their own, using only their *Groundwater Flow Model Presentations* (GWFMPs) as the pre-requisite for the field trip. Since *Da Drops* was no longer a pre-requisite, the EEExchange was no longer needed to help schedule Sweetwater Wetlands field trips.

#### Overview of Program Revisions – *Da Drops*

Worn props were replaced as needed throughout the year.

#### Teacher Evaluations

The 70 completed teacher evaluations showed a continuing strong satisfaction with the *Da Drops* program. Twenty-four percent of the teachers returned their completed evaluations this year (as compared to 41% last year). Of the teachers who completed the evaluations, 21% teach 1<sup>st</sup> grade, 49% 2<sup>nd</sup> grade, and 30% 3<sup>rd</sup> grade.



The following areas of the on-site program received at least 80% excellent ratings: groundwater model and activities, effectiveness of presenter in conveying information, presenter's ability to relate well with students, conveying the value and importance of water, and introducing water conservation. All other areas of the on-site program received 64-79% excellent ratings. All areas of the on-site program received 87-100% excellent and good ratings combined.

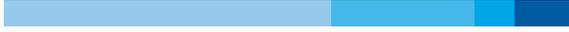
Approximately 54% of teachers completing the evaluation used one or more of the pre/post-visit activities, rating them primarily as excellent and good. However, not all of the teachers completing the evaluation used the materials, thus causing the level of satisfaction on the evaluation form to appear lower than it actually is. In addition, the wording of the question "My students completed these pre- and post-visit activities" may have been unclear to some teachers. Teachers should have selected the numbers 1, 2, and/or 3 based on which specific activities they completed. However, it appears that some teachers may have selected the total number of activities they completed, rather than indicating which specific activities they completed. It appears that approximately 20% used one lesson, 21% used two lessons, 13% used 3 lessons, 34% used none, and 11% did not respond. Sixty-nine percent of the teachers indicated that they would complete lessons after the on-site presentation, 13% indicated they would not, and 18% did not respond. The predominant reasons for not completing pre/post-visit lessons are that teachers already have their own curriculum to teach, and they have time constraints.

Only four teachers indicated that they were not aware of pre/post-visit materials. Although all teachers receive the link to download the materials in both confirmation and reminder emails, unfortunately some teachers do not read their email messages carefully. These teachers are re-sent the link as well as an attachment of the complete set of activities.

Teacher access to the Internet is extremely high. Approximately 96% of teachers have Internet access to schedule presentations, and 98% have easy Internet access to download materials. Every teacher who scheduled this year provided an email address.

When asked if their students' understanding of water conservation improved by participating in the *Da Drops* program, 100% of the teachers responded yes. When asked if they would be interested in participating in the program next year, all teachers completing the evaluation responded yes.

The table below lists the questions asked in the evaluations and percentages of response for each category. Note that each category may not add up to 100% because some teachers did not answer some questions. (This especially affects the results for questions related to the pre-visit activities, because some teachers did not complete the activities, and thus did not answer those questions.)

Da Drops - 70 Total Records	
Please give an overall rating for the following components of the ON-SITE program:	
	<div style="display: flex; justify-content: space-around; font-size: small;"> <span>Excellent</span> <span>Good</span> <span>Fair</span> <span>Poor</span> <span>Not Applicable</span> </div> 
Solid-liquid-gas ice cube activity	67% (E) <span style="float: right;">23% (G) 4% (F) 5% (NA)</span> 
Water Cycle story with Slick the Drop	78% (E) <span style="float: right;">17% (G) 1% (F) 2% (NA)</span> 
Da Drops video	76% (E) <span style="float: right;">16% (G) 2% (F) 4% (NA)</span> 
Groundwater model and activities	84% (E) <span style="float: right;">13% (G) 1% (F) 1% (NA)</span> 
Introduction to reclaimed water	67% (E) <span style="float: right;">22% (G) 2% (F) 8% (NA)</span> 
Colorado River water/CAP canal images	60% (E) <span style="float: right;">28% (G) 4% (F) 7% (NA)</span> 
Water conservation activity	77% (E) <span style="float: right;">16% (G) 1% (F) 1% (P) 4% (NA)</span> 
Effectiveness of presenter in conveying information	82% (E) <span style="float: right;">11% (G) 4% (F) 2% (NA)</span> 
Presenter's ability to relate well with students	81% (E) <span style="float: right;">12% (G) 3% (F) 3% (NA)</span> 
<b>Please rate the overall value of the ON-SITE program in...</b>	
conveying the value and importance of water.	85% (E) <span style="float: right;">10% (G) 1% (F) 3% (NA)</span> 
introducing the three states of water.	75% (E) <span style="float: right;">19% (G) 2% (F) 2% (NA)</span> 

introducing the water cycle.	82% (E)	14% (G)	1% (F)	1% (NA)	
introducing the aquifer and groundwater.	81% (E)	14% (G)	1% (F)	2% (NA)	
introducing Colorado River water and the CAP canal.	75% (E)	20% (G)	2% (F)	2% (NA)	
introducing water conservation.	81% (E)	13% (G)	1% (F)	4% (NA)	
teaching water-related vocabulary words.	75% (E)	19% (G)	1% (F)	4% (NA)	
<b>Please rate the value of the ON-SITE program in...</b>					
integrating into your classroom's curriculum.	77% (E)	19% (G)	1% (F)	2% (NA)	
fitting easily into available classroom time.	80% (E)	17% (G)	1% (F)	1% (NA)	
raising the interest and motivation of your students.	81% (E)	16% (G)	1% (F)	1% (NA)	
being appropriate for the grade level of your students.	82% (E)	16% (G)	1% (NA)		
being easy to schedule.	77% (E)	18% (G)	1% (F)	3% (NA)	
addressing ADE academic standards.	78% (E)	17% (G)	1% (F)	3% (NA)	
<b>Please rate the following components of the PRE-VISIT activities:</b>					
Teacher Background Reading	43% (E)	20% (G)	1% (F)	35% (NA)	
Activity #1: Wondering About Water	39% (E)	19% (G)	1% (F)	1% (P)	40% (NA)

Activity #2: Desert Water Cycle Crossword Puzzle	38% (E)      16% (G)    2% (F)    43% (NA)
Activity #3: Can You Imagine...Life Without Water?	39% (E)      17% (G)      43% (NA)
<b>Please rate the following components of the PRE-VISIT activities:</b>	
integrating into your classroom's curriculum.	46% (E)      18% (G)    35% (NA)
fitting easily into available classroom time.	46% (E)      19% (G)    1% (F)    33% (NA)
raising the interest and motivation of your students.	52% (E)      16% (G)      31% (NA)
being appropriate for the grade level of your students.	51% (E)      13% (G)    1% (F)    35% (NA)
addressing ADE academic Standards.	52% (E)      14% (G)      33% (NA)

### Suggestions for the Future

- Encourage more teachers to do the pre-visit activities. Be more specific in email messages and phone conversations about the activities and how to download them. Emphasize that the activities have been updated to reflect the new ADE standards.
- Replace reclaimed water sign in the kit with new signage.
- Replace worn props in kit.
- Continue to analyze the data from the PDF download counter.
- Reword the evaluation form question relating to the number of pre/post-visit activities completed.
- Revise ADE academic standards once the new Next Generation Science Standards are adopted by the AZ Department of Education (the NGSS were released in April 2013).

## IV. *Our Water, Our Future* Program Summary

The *Our Water, Our Future* program reached 170 classrooms and 4,443 students during the 2013-2014 school year. This represents 6 fewer presentations to 250 fewer students this year at 6 additional schools. The slight decrease in the number of *Our Water, Our Future* presentations is probably the result of both the addition of *El Tour de Agua* middle school presentations in Spring 2014 (these kept the calendar and presenters busier than usual) and a decrease in the number of schools (especially in TUSD because of school closures). Approximately 71% of the presentations were given to 4th grade classes (same as last year), 25% to 5th grade classes (up from 23%), and 4% to multi-age classes (down from 6%). Refer to [Appendices A-C and E](#) for details about school districts, schools and numbers of students reached.



*Our Water, Our Future* pre/post-visit activities are being downloaded by more than just the teachers having on-site presentations. The complete set of revised activities was downloaded 316 times during the 2013-2014 school year (September 1, 2013-May 20, 2014), with individual sections downloaded between 204 and 324 times, so we know that many teachers are aware of these materials on-line, and are possibly even using them outside of the Tucson area. In addition, some teachers continue to download the old versions of the pre/post-visit materials for *Our Water, Our Future*. Although both the scheduling website and the Tucson Water website have posted the revised files, some teachers are still downloading the older files probably found in cached older versions on-line. The complete set of older activities was downloaded 128 times, with individual sections downloaded between 99 and 385 times. Refer to [Appendix A](#) for details.

### Overview of Program Revisions – *Our Water, Our Future*

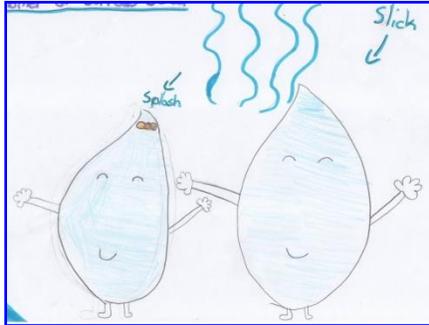
- An activity book was developed and completed for the start of the 2013-2014 school year.
- Additional revisions to the on-site and pre/post-visit activities were completed for the 2013-2014 school year.
- Worn or outdated props were replaced as needed throughout the year.

### Teacher Evaluations

The 31 completed teacher evaluations showed a continuing strong satisfaction with the *Our Water, Our Future* program. Eighteen percent of teachers turned in their evaluations this year, compared with 34% last year. Of the teachers who returned the evaluations, 78% teach 4th grade and 22% 5th grade.

All areas of the on-site program received 81-100% excellent and good ratings combined. Areas of the on-site program that received at least 84% excellent ratings

included groundwater model activities, teaching water supply (groundwater, CAP, reclaimed), teaching the concept of conservation, integrating into your classroom's curriculum, fitting easily into available classroom time, raising the interest and motivation of your students, being appropriate for your grade level students, and being easy to schedule.



Part of the revision of the *Our Water, Our Future* program included the evaluation form. The original question asking teachers how many pre/post-visit lessons they completed was not clearly stated, so that question was redesigned into four separate questions, one for completion of each lesson. Approximately 47% of teachers submitting an evaluation completed Lesson 1, 59% Lesson 2, 38% Lesson 3, and 13% Lesson 4, with 2-9% not responding for each particular lesson. Sixty-five

percent of the teachers indicated that they would complete lessons after the on-site presentation, 25% indicated they would not, and 10% did not respond. The predominant reasons for not completing pre/post-visit lessons are that teachers already have their own curriculum to teach, and they have time constraints.

Only two teachers indicated that they were not aware of pre/post-visit materials. Although all teachers receive the link to download the materials in both confirmation and reminder emails, unfortunately some teachers do not read their email messages carefully. These teachers were re-sent the link to the scheduling website as well as an attachment of the complete set of activities.

Teacher access to the Internet is extremely high. Ninety-seven percent of teachers have Internet access to schedule presentations and 94% have access to download materials online. Every teacher who scheduled this year provided an email address.

When asked if their students' understanding of water conservation improved by participating in the *Our Water, Our Future* program, 100% of the teachers responded yes. When asked if they would be interested in participating in the program next year, 97% of the teachers responded yes (with only one teacher indicating no, but without any explanation).

The table below lists the questions asked in the evaluations and percentages of response for each category. Note that each category may not add up to 100% because some teachers did not answer some questions. (This especially affects the results for questions related to the pre-visit activities, because some teachers did not complete the activities, and thus did not answer those questions.)

Our Water, Our Future - 31 Total Forms	
Please give an overall rating for the following components of the ON-SITE program:	
	<div style="display: flex; justify-content: space-around; width: 100%;"> <span>Excellent</span> <span>Good</span> <span>Fair</span> <span>Poor</span> <span>Not Applicable</span> </div>
Groundwater model and activities	90% (E) 10% (G) % (NA)
Colorado River/CAP activity	66% (E) 19% (G) % (F) % 16% (NA)
Reclaimed water activity	61% (E) 29% (G) % (F) % 10% (NA)
Water On The Go game	68% (E) 26% (G) % (F) % 6% (NA)
Water conservation activity	65% (E) 26% (G) % (F) % 10% (NA)
Effectiveness of presenter in conveying information	74% (E) 19% (G) % (F) % 3% (NA)
Presenter's ability to relate well with students	68% (E) 23% (G) % (F) % 6% (NA)
Please rate the value of the ON-SITE program in...	
teaching the concept of water cycles.	58% (E) 29% (G) % (F) % 6% (NA)
teaching water supply (groundwater, CAP, reclaimed).	84% (E) 13% (G) % (F) % 3% (NA)
teaching the concept of conservation.	84% (E) 19% (G) % (F) % 3% (NA)
integrating into your classroom's curriculum.	74% (E) 23% (G) % (F) % 3% (NA)
fitting easily into available classroom time	94% (E) 3% (G) % (F) % 3% (NA)
raising the interest and motivation of your students.	84% (E) 13% (G) % (F) % 3% (NA)
being appropriate for your grade level students.	84% (E) 13% (G) % (F) % 3% (NA)

being easy to schedule.	87% (E)	13% (G)	3% (F)	6% (NA)
addressing ADE academic standards.	68% (E)	13% (G)	3% (F)	16% (NA)
<b>Please give an overall rating of the PRE- and POST-VISIT lessons:</b>				
Lesson 1: Water History and Supply - Tucson's Water Story	35% (E)	19% (G)	1% (F)	45% (NA)
Lesson 2: Water Systems - Our Water Cycle	35% (E)	23% (G)	1% (F)	42% (NA)
Lesson 3: Water Conservation - Becoming Water Smart	32% (E)	26% (G)	1% (F)	42% (NA)
Lesson 4: Water Poetry - "A River of Words" Poetry	19% (E)	23% (G)	1% (F)	58% (NA)
Our Water, Our Future Vocabulary	42% (E)	19% (G)	3% (F)	35% (NA)
Our Water, Our Future Activity Booklet	52% (E)	16% (G)	1% (F)	32% (NA)
<b>Please rate the value of the PRE- and POST-VISIT lessons in...</b>				
introducing the concept of water cycles.	42% (E)	13% (G)	3% (F)	32% (NA)
introducing water supply (groundwater, CAP, reclaimed).	45% (E)	13% (G)	1% (F)	32% (NA)
introducing the concept of water conservation.	48% (E)	10% (G)	1% (F)	42% (NA)
integrating into your classroom's curriculum.	39% (E)	16% (G)	1% (F)	45% (NA)
fitting easily into available classroom time.	39% (E)	16% (G)	3% (F)	42% (NA)
raising the interest and motivation of your students.	42% (E)	16% (G)	1% (F)	42% (NA)
being appropriate for your grade level students.	48% (E)	13% (G)	1% (F)	39% (NA)
addressing ADE academic standards.	45% (E)	16% (G)	1% (F)	39% (NA)

## Suggestions for the Future

- Replace worn props in kit.
- Encourage more teachers to do the pre-visit activities. Be more specific in email messages and phone conversations about the activities and how to download them. Emphasize that the activities have been updated to reflect the new ADE standards.
- Continue to analyze the data from the PDF download counter.
- Revise ADE academic standards once the new Next Generation Science Standards are adopted by the AZ Department of Education (the NGSS were released in April 2013).

## V. *El Tour de Agua* Program Summary

*El Tour de Agua*, a new middle school program (grades 6-8) including an on-site classroom presentation, was developed during 2013-2014. *El Tour de Agua* focuses on water sources, water recycling, and water conservation, with an emphasis on understanding if our water sources are reliable, safe and sustainable.

The classroom presentation is approximately one hour in length and uses a Prezi media format rather than posters, for a more exciting and interactive learning experience. A model and assorted props are also used for hands-on and interactive learning. To provide background to their students, teachers first show a pre-visit PowerPoint presentation that includes a complete script (both in the notes section of the PowerPoint and as a separate file). Students complete the related Student Study Guide during the PowerPoint presentation. Teachers can follow up the on-site classroom presentation with a post-visit lesson on water conservation entitled “*How Does Your Shower Flow?*”, using the Shower Flow Kit materials that all students receive at the end of the classroom presentation. (The Shower Flow Kit includes a flow measurement bag, shower timer, and parent permission form to request a low flow showerhead.) Teachers are encouraged to have their students participate in the *40 Gallon Challenge* (<http://www.40gallonchallenge.org>). For the pilot, teachers were able to download the pre- and post-visit materials at <http://www.outreach-scheduling.org/eltourdeagua.php>.

In April and May 2014, *El Tour de Agua* was piloted to 50 classrooms and 1,443 students, representing 25 teachers at 11 schools in 5 districts. All of the pilot presentations were scheduled for 6th grade classes. Refer to [Appendices A, C and F](#) for details about school districts, schools and numbers of students reached

## Teacher Evaluations

At the beginning of a presentation, each teacher received an evaluation form with a stamped and addressed envelope. The presenter encouraged the teacher to complete the evaluation during or shortly after the presentation. Fifteen evaluations (60%) were completed, with 20% returned via email and 80% via regular mail. The completed teacher evaluations showed a strong satisfaction with the *El Tour de Agua* program. All areas of the on-site program received 77-100% excellent and good

ratings combined. Approximately 54% of the twenty-eight aspects of the on-site program received 100% excellent ratings. Several comments related to a need for a clearer understanding of the urban water cycle, as well as glitches in Prezi. The urban water cycle will be better addressed in both the pre-visit and on-site portions of the program, and the Prezi will be revised to address these concerns (in addition, as presenters became more familiar with using the Prezi, there were fewer problems).



Approximately 93% of teachers submitting an evaluation completed the Pre-Visit PowerPoint Program; the only teacher not to complete the PowerPoint Program did use some of the slides and information in her own lessons. Approximately 80% of teachers used the Pre-Visit Student Study Guide; those not using cited lack of time as an explanation. For the pilot, timing was definitely an issue, as the presentations were only offered in late April and May, the end of the school year. Some teachers were already finished with their water unit, but still wanted to participate in the pilot; other teachers had a limited number of classes in which to finish up their curriculum. All aspects of the Pre-Visit materials received 80-100% excellent and good

ratings.

Approximately 60% of teachers submitting an evaluation completed the Post-Visit Lesson: *How Does Your Shower Flow?* and 67% had their students take the *40 Gallon Challenge*. (One teacher used it as an optional homework assignment with a few students participating.) The predominant reason for not completing either lesson was related to time constraints, as previously explained. All aspects of the Post-Visit Lessons received 67-80% excellent and good ratings.

Teacher access to the Internet is extremely high. All teachers completing the evaluation have Internet access to schedule presentations and all have access to download materials online. Every teacher who scheduled provided an email address; in fact, all scheduling for the pilot was done via email.

When asked if their students' understanding of water sources and water conservation improved by participating in the *El Tour de Agua* program, 100% of the teachers responded yes. When asked if they would be interested in participating in the program next year, 100% of the teachers responded yes. When asked about the importance of having a list of relevant ADE standards, 67% responded yes. (ADE standards were used to develop the program, but were not listed in the pilot program materials. They will be added for the next school year.)

The table below lists the questions asked in the evaluations and percentages of response for each category. Note that each category may not add up to 100% because some teachers did not answer some questions. (This especially affects the

results for questions related to the pre- and post-visit activities, because some teachers did not complete the activities, and thus did not answer those questions.)

<i>El Tour de Agua PILOT</i> <b>Teacher Evaluation Results</b>	<b>Excellent</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>	<b>NA</b>
<b>Please give an overall rating for the following components of the ON-SITE program:</b>					
Use of Prezi (visual media format) for program presentation	47%	13%	20%		
Use of Prezi character (bicyclist) to engage students	40%	47%	13%		
Review of key messages with Water Wheel of Fortune	40%	53%	7%		
Conveying water use with Prezi and gallon jug	67%	33%			
Conveying reliable, safe, sustainable with water jug and Prezi	67%	27%			
Use of model for Down the Drain activity (recycling water)	73%	27%			
Clarity of Prezi in illustrating how water is recycled	40%	33%	13%		
Use of the Water Wheel of Fortune for engaging students	60%	40%			
Use of water saving devices for teaching water conservation	53%	33%	7%		
Clarity of Prezi in illustrating water conservation	53%	27%	13%		
Overall effectiveness of presenter in conveying information	87%	13%			
Presenter's ability to relate well with students	87%	13%			
<b>Please rate the value of the ON-SITE program activities in...</b>					
teaching how much water is used (by students, the city, etc.)	80%	20%			
teaching about water supplies (groundwater, CAP, recycled).	67%	33%			
teaching the concept of reliable, safe, and sustainable water.	47%	53%			
teaching the importance of recycled water.	67%	33%			
teaching how water is recycled.	53%	33%	13%		
teaching the importance of not washing items down the drain.	67%	27%	7%		
teaching the concept of nature's and urban water cycles.	40%	47%	13%		
teaching the importance of water conservation.	87%	13%			
teaching specific ways to conserve water.	80%	13%	7%		
challenging students to conserve water at home.	80%	13%	7%		
integrating into your classroom's curriculum.	73%	27%			
raising the interest and motivation of your students.	60%	40%			
fitting into available classroom time.	73%	27%			
being appropriate for your grade level students.	87%	13%			
being easy to schedule.	73%	20%	7%		
addressing ADE academic standards.	93%	7%			
<b>On-Site Comments:</b>					
<i>The visuals were awesome!</i>					
<i>The urban water cycle difficult for students to understand.</i>					
<i>The presenter did a great job! Very engaging ☺</i>					
<i>Excellent and much needed presentation to kids.</i>					
<i>[The presenter] met challenges with courage and patience.</i>					

<i>Excellent presenter.</i>					
<i>Prezi program and application has glitches on everything I use it for.</i>					
<i>Like to see more of an urban cycle explanation.</i>					
<i>Presenters were very enthusiastic!:) )</i>					
<i>Application of Prezi had many glitches.</i>					
<i>Speaker...did an excellent job.</i>					
<i>All [aspects] were excellent. The kids liked it when they could click on the wheel.</i>					
<i>Wheel, Down the Drain, and especially water saving devices were engaging; loved the critical thinking in the device activity – if more critical thinking and activities with manipulatives could be incorporated it would boost engagement. Prezi/PowerPoint are much less engaging tools.</i>					
<i>I thought it was engaging and hands on.</i>					
<b>Please give an overall rating for the PRE-VISIT lesson components:</b>					
Pre-Visit El Tour de Agua PowerPoint Program	53%	27%	20%		
Pre-Visit El Tour de Agua Student Study Guide	47%	33%	20%		
<b>Please rate the value of the PRE-VISIT lesson in...</b>					
introducing important water concepts and vocabulary.	53%	40%	7%	10%	
introducing the concept of nature's and urban water cycles.	53%	33%	13%	10%	
introducing water supplies (groundwater, CAP, recycled).	80%	20%			
introducing the concept of water conservation.	67%	33%			
integrating into your classroom's curriculum.	60%	40%			
fitting easily into available classroom time.	53%	40%		7%	
raising the interest and motivation of your students.	46%	33%	13%	7%	
preparing your students for the on-site presentation.	60%	40%		10%	
being appropriate for your grade level students.	73%	27%			
	<b>YES</b>	<b>NO</b>			
Did you present the Pre-Visit PowerPoint Program?	93%	7%			
Did your students complete the Pre-Visit Student Study Guide?	80%	20%			
If not (for one or both), please let us know why:					
<i>lack of time, especially at end of school year</i>	13%				
<b>Pre-Visit Comments:</b>					
<i>The pictures were awesome! Students enjoyed! The PPT could have had more words for students to follow along. Provided some explanation on slides. The script was a lot to read.</i>					
<i>The PowerPoint was very long. Also, it was not very engaging and it would be nice if more info was placed in the PowerPoint instead of the notes sheet.</i>					
<i>I'm not crazy about PowerPoint presentations but this one seemed to work well; question sheet helps a lot; good/relevant</i>					

<i>info presented.</i>					
<i>The PowerPoint is kind of long.</i>					
<i>The material is excellent and very complete. I learned so much! I reviewed all of this material by incorporating it into my lessons I already had. I did not go through the PowerPoint slide by slide. I did use some of the pictures especially the ones about CAP and the maps of Arizona when I was doing my own lessons. My sixth graders would not have been able to sit through this if I presented I in the way that it was intended. It is too long and not interactive enough.</i>					
<i>Great graphics/illustrations; lots of relevant information.</i>					
<b>Please give an overall rating for the POST-VISIT lesson components:</b>					
Post-Visit Lesson: How Does Your Shower Flow?	33%	40%			13%
Post-Visit opportunity to receive free low flow showerhead	27%	40%	7%		13%
Post-Visit 40 Gallon Challenge	70%	70%	7%		13%
<b>Please rate the value of the POST-VISIT lessons in...</b>					
reinforcing and applying student learning.	40%	33%	7%		7%
challenging students to conserve water.	47%	33%			7%
having students share their learning with families.	40%	27%	13%		7%
receiving and using give-aways to encourage water savings.	33%	33%	13%		7%
	<b>YES</b>	<b>NO</b>			
Did your students conduct the Post-Visit Lesson: <i>How Does Your Shower Flow?</i>	60%	27%			
Did your students take the <i>40 Gallon Challenge?</i>	74%	20%			
If not (for one or both), please let us know why:					
<i>lack of time</i>	20%				
<i>a few students followed up on their own</i>	7%				
Did you investigate the <i>40 Gallon Challenge</i> on-line?	33%	40%			
<b>Post-Visit Comments:</b>					
<i>I did not have time to do these. It was the end of the year...I did give extra credit if kids showed me a picture of them installing the timer in their shower.</i>					
<i>Students enjoyed the shower flow experiment.</i>					
<i>I would recommend an incentive to follow up on the challenge.</i>					
<i>Did not do but have used the bags in previous years. Great activity, gets the whole family involved.</i>					
<b>Additional Questions:</b>	<b>6</b>	<b>7</b>	<b>8</b>		
My students are in grade:	100%				

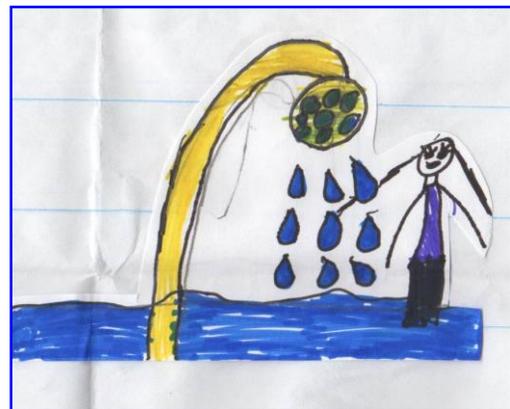
	YES	NO			
My students' understanding of water sources and water conservation in Tucson improved by participating in the <i>El Tour de Agua</i> Program.	100%				
It is important for me to have a list of relevant ADE standards included with the program materials in the future.	67%				
I would be interested in participating in the program next year.	100%				
I have easy Internet access to download materials.	100%				
Where does this program best integrate into your curriculum (for example, which class, which unit, which time of year, etc.)?					
<i>Early school year</i>					
<i>Water Unit – December</i>					
<i>After January</i>					
<i>Water Conservation – 2<sup>nd</sup> semester</i>					
<i>Science - March/April – x3</i>					
<i>Water Cycle Unit - May</i>					
<i>Science - end of year – x2</i>					
<i>Science – Foss kit dates vary each year - x2</i>					
<i>Natural Resources</i>					
<i>Science - Water Unit</i>					
<i>Systems, Water Use</i>					
<b>If you could change anything about the El Tour de Agua program, it would be...</b>					
<i>Just work out the technical glitches! It will be great ☺</i>					
<i>Better vocab intro, more kid-friendly, more diagrams/pics of water amounts</i>					
<i>A little less reliance on Prezi during live presentation, a little more new information in addition to reviewing the pre-visit info, more activities with manipulatives.</i>					
<i>Change character to something about water instead of the helmeted guy.</i>					
<i>The helmet and Tour de Tucson guy - kids don't make connection</i>					
<b>Overall Comments:</b>					
<i>It was great! Such wonderful information!!</i>					
<i>Thank you. The kids learned much and enjoyed.</i>					
<i>Awesome job!!:)</i>					
<i>Great program! I need help understanding the difference between percolation and infiltration; might want to make clear if 45% outdoor water use includes pool?; take out apostrophe in Question 14 (Tucsonans).</i>					
<i>[The presenters] did a great job!</i>					
<i>Great start! Can't wait to see how the program evolves. Thank you for allowing us to be your guinea pits!</i>					
<i>[The presenter] was excellent.</i>					

<p>[The presenter] was excellent. She related to all levels of the kids, adapted to last minute changes, answered all questions, even brought the “strange” ones back to the curriculum, kids felt comfortable, managed the class, most of all kept me interested!</p>					
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## Revisions

Based on responses from teachers completing the pilot evaluation, feedback from the presenters, and observations from Neil Markowitz and Debbie Gevirtzman, the following revisions will be completed during Summer 2014:

- Develop the pre-visit PowerPoint presentation into a video (20-25 minutes in length, with options for teachers to pause). Improve the Urban Water Cycle diagram. Revise the accompanying Student Study Guide.
- Revise the on-site script as needed including a more detailed explanation of “El Tour de Agua” and the Prezi character (to be named Cruz), revising the water conservation activity to work with small groups rather than individuals.
- Modify the on-site Prezi media presentation. Some revisions include the following: the first part of the program will move more linearly (with forward clicks of the mouse), the “wheel of fortune” will only be spun once at the beginning, remove the “wheel of fortune” from the conservation activity, improve the Down the Drain water recycling imagery and labeling, provide infographics near end to show water savings.
- Add additional props to the water conservation activity.
- Modify the Down the Drain model to be smaller and have openings for balls at the top rather than on the back of the model. Add felt to the stands to prevent scratching. Design a carrying case for the new model.
- Revise the post-visit lesson as needed.
- Include AZ Department of Education Academic Standards for all aspects of the program.
- Format the pre- and post-visit materials, then post on-line.
- Add *El Tour de Agua* to the scheduling website, so that teachers can schedule themselves on-line and download related materials. The downloads will be linked to the pdf download counter.
- Consider including faucet aerators or pencils printed with the *40 Gallon Challenge* URL as student give-aways in the future.



## VI. Tucson Toolkit Summary

The *Tucson Toolkit: Perspectives on Our Water* was used by 8 teachers at 4 schools with 515 students during the 2013-2014 school year. Use of the *Tucson Toolkit* decreased this year by 1 teacher and increased by 87 students. Refer to [Appendix G](#) for details.

It is unknown if Project WET continued to distribute the *Tucson Toolkit* materials this year in conjunction with their classroom presentations to 6<sup>th</sup> grade classes in TUSD/FWUSD.

The Teachers' Guide is being downloaded on a much larger scale than is reflected by our *Toolkit* users. The complete guide was downloaded 1470 times during the 2013-2014 school year (September 1, 2013-May 20, 2014), with individual sections downloaded between 186 to 319 times, so we know that many teachers are aware of these materials on-line. Refer to [Appendix A](#) for details.

No teachers requested low flow showerheads for their students this year. Requesting showerheads is an additional step that a *Toolkit* teacher needs to follow through on that does not directly affect the curriculum, so it may likely be set aside.

The *Tucson Toolkit* will no longer be distributed by the EEExchange after this school year. However, the post-visit shower flow activity has been modified and incorporated in the new *El Tour de Agua* program. Students who participate in the *El Tour* presentation will receive Shower Flow Kits and are eligible to receive free low flow showerheads.

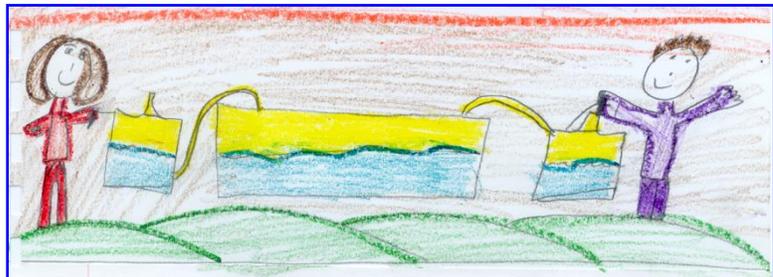
### Teacher Evaluations

Teachers were not asked to complete evaluations this year, because the program will longer be offered.

## VII. Classroom Presenters

Teacher evaluations indicated extremely high teacher satisfaction with classroom presenters. When asked about the effectiveness of the presenter in conveying information and the presenter's ability to relate well with students, teachers overwhelmingly rated presenters as excellent and good (97% and 96% for *Da Drops* and 93% and 91% for *Our Water, Our Future*).

On August 26, 2013, new presenters attended a 2-hour *Da Drops* training to review scripts and kit materials, and on September 26, 2013, new and returning presenters attended a 2-hour *Our Water, Our Future* training to review the revised



program. Presenters attended a 2-hour training on August 28, 2013 to learn about the logistics of being a presenter, including discussions on the contents of the training notebook, pay and time sheets, transportation, kit storage and supplies, the scheduling website, and classroom management. The new presenter observed two presentations of each program before doing programs on her own.

This year's presenters include:

**Torran Anderson** earned his B.A. in Liberal Studies from Northern Arizona University and his M.A. in Teacher Education from Goddard College. He has been in the field of education for over 20 years and worked with the Environmental Education Exchange as a presenter, as a program coordinator, and on presentation revisions. He writes leveled readers for Learning A-Z and created the environmental story app *Earth Day Carol*.

**Claudia Diaz-Combs** received her BS in Environmental Sciences from the University of Arizona with a focus on geology and climate sciences as well as a minor in Spanish. She has been working for Environmental Education Exchange for one year and has plans to continue teaching youth in Tucson about the importance of earth sciences.

**Cassie Mason** received a B.A. in Russian Area Studies with a minor in Biology from George Mason University and a Masters Degree in Russian Linguistics at the University of Arizona. Cassie spent a year abroad in Russia and lived in England for three years. Returning to the U.S. in 2001, she was a 4th-7th grade science teacher and curriculum director for 5 years at a private school in North Carolina. She coordinated a watershed education program for the Paolet Area Conservancy. She continued her career as a 5th grade teacher in Portland, Oregon for three years. She helped coordinate and chaperone a mission trip to Nicaragua in 2010. This was Cassie's second year presenting with the EEExchange and she is excited to engage with students about issues of environmental impact.

**Brian Stark** is a distance runner and published author who received his B.S. in Communication from Hanover College, his teaching certification from Prescott College, and his M.Ed. in Administration from Northern Arizona University. Brian taught middle school language arts for seven years, was an interpreter and tour guide at Kartchner Caverns, and has been a crew leader for a local environmental outdoor youth corps.



He has participated in multiple sessions with the Arizona Department of Education AIMS data review and curriculum alignment. While growing up, Brian spent 13 summers working at a rugged overnight summer camp in Indiana where he served as camp director. This was his third year presenting with the Environmental Education Exchange.

**Julie Strom** joined the EEExchange as an outreach presenter in the fall of 2013. In addition to presenting established curriculum, she helped design and implement programs presented at ReCommunity Tucson's Materials Recovery Facility and to pilot the new middle school water program. Julie earned her bachelor's degrees in Botany and Zoology from the University of Massachusetts, Amherst, and received her

teaching certificate and master's in environmental education from the University of Arizona. Julie was a classroom teacher and assistant principal for over ten years before joining the education staff at the Arizona-Sonora Desert Museum where she worked for 9 years designing and implementing environmental education curriculum, running the junior docent program, teaching and mentoring graduate interns as well as caring for and training Sonoran Desert animals. In addition to her work with the EEEExchange, Julie currently works as an educator in the Pima County Natural Resources, Parks and Recreation Department.

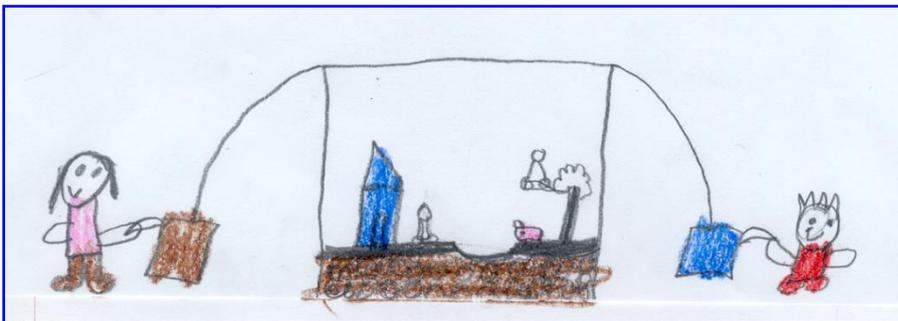
**Debbie Gevirtzman** has been the Outreach Education Coordinator at the Environmental Education Exchange for eleven years, in addition to being an occasional classroom presenter. Debbie also assists in the design and development of classroom presentations, educational curricula, and training workshops. She received her B.A. in Geology from the University of Pennsylvania, her M.S. in Geology from the University of California at Davis, and her teaching certificate from the University of Arizona. She taught science and math in Tucson for many years, primarily at the middle school level. Her classroom was one of the pilot classes using Tucson Water's middle school curriculum, the *Tucson Toolkit*. Debbie has also worked at the Arizona-Sonora Desert Museum as an earth sciences interpreter, and has developed and presented teacher and student workshops for the Southwest Environmental Health Sciences Center at the University of Arizona.

## VIII. What Teachers Have To Say

*As always, the pre-activities, presentation, and the post-activities were terrific. My students and I loved every part of the programs. My students especially loved the booklet. Thanks for a valuable experience for my students!*

*The presenter was excellent. FANTASTIC responding and dealing with young children. She engaged the children very well.*

*[Our presenter] did a fantastic job. It was very engaging, grade/age level appropriate and very informative. Thanks for having this available to us!*



*The kids really loved our presenter.*

*We have always enjoyed having the Da Drops program come to our school.*

*Thank you for educating our children.*

*It was easy to schedule, and the kids loved the presentation.*

*The presenter was personable and encouraged student questions.*

*Wonderful presentation! Dr. Faucet was very friendly and knowledgeable.*

*Presenter was very friendly...She explained content well and appropriately to 2<sup>nd</sup> grade students☺ Thank you Dr. Faucet! The cup you give students is great! Students had something to take home and remind them of what they learned; they were anxious to share what they had learned about water conservation.*

*The lessons are engaging and informative. My students were able to understand what was being taught and could relate the lesson to their everyday lives.*

*This was a great presentation and well-prepared. The pre lessons were fun and gave background knowledge to the students and/or reinforced information they already had.*

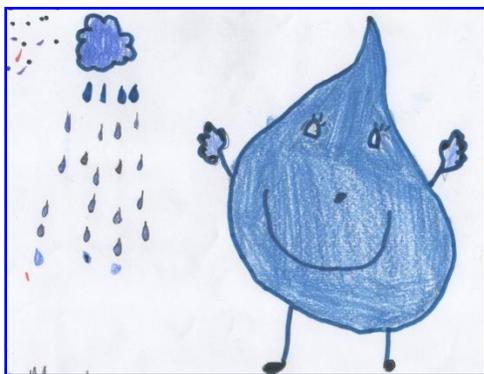
*My students were very engaged and loved the activities used to show the water cycle. I thought the presentation was well done with great models to explain the different cycles of water use.*

*Really great presentation – students were engaged and excited to participate. Awesome! Dr. Faucet was kind, knowledgeable, and worked well with the wide variety of students and their responses that may exist in a single classroom.*

*We really learned about how pumping groundwater can deplete an aquifer. This is great citizenry instruction!*

*Thank you for a great presentation once again! My students love having a guest in the classroom, and you provided models that are just not possible for me to have.*

## **IX. What Students Have To Say...**



*Thank you for coming to our classroom today. I like the cups and the activity books. Thank you for teaching us about where our water comes from. Also thank you for introducing us to Slick and his cousin. I promise you I will save as much water as I can!*

*I have learned to save water. Just because of you. Thank you so much for the shower timer.*

*Thank you for giving us the shower coach. I use it in the shower. Even when I brush my teeth I use it. It was fun when we played the game and I learned saving water is good.*

*...From now on I'll take 5 minute showers and make sure the faucet isn't dripping.*

*Thank you for the timer thing because me, my dad, my mom, and my two big brothers use it.*

*I actually learned something and that is that there is water underground an it is running out so you told us not to waste that much water and that's what I'm gonna do.*

*Thank you for teaching us about water. Now I'm saving water at home.*

*Your presentation was great. It was the funnest one I've been to. Because of you, we all learned how to save water. Thank you!*

*The video you showed us was cool...I'm going to save water by using less water when I wash my hands.*

*I liked the little movie, the big tank, and the presentation. I learned to take less time taking showers or washing hands. I learned to turn off the water while rushing my teeth. Thank you for the water cup and the booklet.*

*I can't wait for you to come back to our school again next year.*

*I loved your method of teaching us. The game was fun and I loved the pictures. It was interesting.*

*After your visit I was more careful with water at my house. I timed myself to take a 7 minute shower and every once in a while take a 10 minute shower to relax after a long, long, long day. I liked your visit here because you taught me something new.*

*I will save water more than I do right now...I thought the whole presentation was so cool.*



## APPENDIX A

### Tucson Water Outreach Education Summary Report: 2013-2014

#### Summary

In 2013-2014, The Environmental Education Exchange presented a total of **293** *Da Drops* and **170** *Our Water, Our Future* programs to a total of **11,858 students** at **93 schools**. The *Tucson Toolkit* was delivered to **5** teachers at **4** schools to a total of **515 students**. In addition, **50** *El Tour de Agua* pilot programs were presented to **1,443** students at **11** schools. In total, **13,816** students at **102** schools participated in Tucson Water Outreach Education Programs.

<b><i>Da Drops</i></b>	
2013-2014:	<b>293 Presentations</b>
1 <sup>st</sup> Grade:	2064 students
2 <sup>nd</sup> Grade:	2200 students
3 <sup>rd</sup> Grade:	2704 students
Other (K-2, 1 <sup>st</sup> /2 <sup>nd</sup> , 1 <sup>st</sup> -3 <sup>rd</sup> , 2 <sup>nd</sup> /3 <sup>rd</sup> , 3 <sup>rd</sup> /4 <sup>th</sup> ):	447 students
<b>Total Students:</b>	<b>7415 students reached</b>
<b>Total Schools:</b>	<b>69 schools visited</b>

#### **Schools visited** (For details, refer to [Appendix D.](#))

TUSD: Banks, Blenman, Bloom, Booth-Fickett, Borman, Borton, Carrillo, Cavett, Collier, Cragin, Davidson, Dietz, Drachman, Erickson, Ford, Fruchthendler, Grijalva, Henry, Hollinger, Howell, Hudlow, Hughes, Kellond, Lawrence, Lineweaver, Lynn-Urquides, Maldonado, Marshall, McCorkle, Miles, Miller, Mission View, Oyama, Pueblo Gardens, Robins, Roskruge, Safford, Sewell, Soleng Tom, Tully, Van Buskirk, Vesey, Wheeler, White, Whitmore, and Wright Elementary Schools  
 AMPHI: Harelson, Nash, and Rio Vista Elementary Schools  
 CFSD: Canyon View, Sunrise Drive, and Ventana Vista Elementary Schools  
 FWUSD: Hendricks and Homer Davis Elementary Schools  
 MUSD: Coyote Trail, Desert Winds, Estes, Ironwood, Rattlesnake Ridge, Roadrunner, Thornydale, and Twin Peaks Elementary Schools  
 SUSD: Elvira Elementary School  
 TVUSD: Agua Caliente and Tanque Verde Elementary Schools  
 VUSD: Desert Willow Elementary School  
 CHARTER: Academy of Math and Science, Our Mother of Sorrows Catholic School, Tucson Hebrew Academy

<b><i>Our Water, Our Future</i></b>	
2013-2014:	<b>170 Presentations</b>
4 <sup>th</sup> Grade:	3155 students
5 <sup>th</sup> Grade:	1103 students
Other (3 <sup>rd</sup> , 3 <sup>rd</sup> /4 <sup>th</sup> , 4 <sup>th</sup> /5 <sup>th</sup> ):	185 students
<b>Total Students:</b>	<b>4443 students reached</b>
<b>Total Schools:</b>	<b>54 schools visited</b>

#### **Schools visited** (For details, refer to [Appendix E.](#))

TUSD: Bloom, Bonillas, Booth-Fickett, Borman, Cragin, Davis Bilingual, Dunham, Ford, Gale, Grijalva, Henry, Hollinger, Howell, Hughes, Lynn-Urquides, Lawrence, Manzo, Marshall, Maxwell, Pueblo Gardens, Roberts/Naylor, Rose, Roskruge, Soleng Tom, Tully, Wheeler, and Wright Elementary Schools  
 AMPHI: Harelson, Holaway, Nash, and Painted Sky Elementary and Coronado K-8 Schools  
 CFSD: Canyon View, Manzanita, Sunrise Drive, and Ventana Vista Elementary Schools

FWUSD: Centennial, Homer Davis, Laguna, and Richardson Elementary Schools  
 MUSD: Estes, Ironwood, Picture Rocks, Quail Run, and Thornydale Elementary Schools  
 TVUSD: Agua Caliente and Tanque Verde Elementary Schools  
 VUSD: Acacia Elementary School  
 CHARTER: Academy of Tucson Elementary School, Children Reaching for the Sky, Children's Success Academy, La Paloma Academy-Central  
 PRIVATE: Immaculate Heart Academy, Santa Cruz Catholic School

<b><i>El Tour de Agua PILOT</i></b>	
Spring 2014 Presentations:	<b>50 Total</b>
6 <sup>th</sup> Grade:	1443 students
<b>Total:</b>	<b>1443 students reached</b>

**Schools visited** (For details, refer to [Appendix F.](#))

TUSD: Dodge Middle School (6<sup>th</sup> grade, x5); McCorkle Middle School (6<sup>th</sup> grade, x3); Pistor Middle School (6<sup>th</sup> grade, x4); Roberts/Naylor K-8 School (6<sup>th</sup> grade, x3)  
 AMPHI: Coronado K-8 School (6<sup>th</sup> grade, x6); La Cima Middle School (6<sup>th</sup> grade, x6); Wilson K-8 School (6<sup>th</sup> grade, x6)  
 CFSD: Orange Grove Middle School (6<sup>th</sup> grade, x7)  
 MUSD: Butterfield Elementary School (6<sup>th</sup> grade, x3); Twin Peaks Elementary School (6<sup>th</sup> grade, x3)  
 TVUSD: Tanque Verde Elementary School (6<sup>th</sup> grade, x4)

<b><i>Tucson Toolkit</i></b>	
2013-2014:	<b>8 teachers/4 schools</b>
<b>Total:</b>	<b>515 students reached</b>

**Schools participating** (For details, refer to [Appendix G.](#))

TUSD: Maxwell K-8 (2 teachers – 5<sup>th</sup> grade); McCorkle Academy of Excellence K-8 (3 teachers – 6<sup>th</sup> grade); Valencia Middle School (2 teachers – 6<sup>th</sup> grade)  
 VUSD: Civano Community School (1 teacher – 6<sup>th</sup>-8<sup>th</sup> grade)

<b><i>Special Events</i></b>	
2013-2014	
<b>Total:</b>	<b>4 special events</b>

For details, refer to [Appendix H.](#)

**ALL SCHOOLS VISITED**

TUSD: Banks, Blenman, Bloom, Bonillas, Booth-Fickett, Borman, Borton, Carrillo, Cavett, Collier, Cragin, Davidson, Davis Bilingual, Dietz, Drachman, Dunham, Erickson, Ford, Fruchthendler, Gale, Grijalva, Henry, Hollinger, Howell, Hudlow, Hughes, Kellond, Lawrence, Lineweaver, Lynn-Urquides, Maldonado, Manzo, Marshall, Maxwell K-8, McCorkle K-8, Miles K-8, Miller, Mission View, Oyama, Pueblo Gardens K-8, Roberts/Naylor K-8, Robins, Rose K-8, Roskruge, Safford, Sewell, Soleng Tom, Tully, Van Buskirk, Vesey, Wheeler, White, Whitmore, and Wright Elementary Schools; Dodge, Pistor, and Valencia Middle Schools  
 AMPHI: Harelson, Holaway, Nash, Painted Sky, and Rio Vista Elementary Schools; Coronado and Wilson K-8 Schools; La Cima Middle School  
 CFSD: Canyon View, Manzanita, Sunrise Drive, and Ventana Vista Elementary Schools; Orange Grove Middle School  
 FWUSD: Centennial, Hendricks, Homer Davis, Laguna, and Richardson Elementary Schools  
 MUSD: Butterfield, Coyote Trail, Desert Winds, Estes, Ironwood, Picture Rocks, Quail Run, Rattlesnake Ridge, Roadrunner, Thornydale, and Twin Peaks Elementary Schools  
 SUSD: Elvira Elementary School  
 TVUSD: Agua Caliente and Tanque Verde Elementary Schools  
 VUSD: Acacia and Desert Willow Elementary Schools; Civano Community School K-8

CHARTER: Academy of Math and Science, Academy of Tucson Elementary School, Children Reaching for the Sky, Children’s Success Academy, La Paloma Academy-Central, Our Mother of Sorrows Catholic School, Tucson Hebrew Academy  
 PRIVATE: Immaculate Heart Academy, Santa Cruz Catholic School

### Water Curricula Downloaded 2013-2014

Water Curricula Downloaded	2013-2014*
DD - COMPLETE	349
DD - ACTIVITY 1	340
DD - ACTIVITY 2	442
DD - ACTIVITY 3	357
DD - PRELIMINARY INFO	275
DD - ADE STANDARDS	241
REVISED OWF - COMPLETE	316
REVISED OWF - LESSON 1	232
REVISED OWF - LESSON 2	324
REVISED OWF - LESSON 3	204
REVISED OWF - LESSON 4	265
REVISED OWF – TEACHER LETTER	227
REVISED OWF - VOCABULARY	204
REVISED OWF - ADE STANDARDS	273
OWF - COMPLETE	128
OWF - LESSON 1	259
OWF - LESSON 2	385
OWF - LESSON 3	315
OWF - LESSON 4	746
OWF - PRELIMINARY INFO	99
OWF - ADE STANDARDS	115
TT - COMPLETE	1470
TT - UNIT 1	319
TT - UNIT 2	211
TT - UNIT 3	212
TT - UNIT 4	186
TT - UNIT 5	250
TT - ADDITIONAL INFO	187
TT - ADE STANDARDS	188
SW - COMPLETE	277
SW – FRONT COVERS, WELCOME	197
SW – WATER CYCLE	267
SW – INTRO TO WETLANDS	225
SW – WETLAND ECOLOGY	852
SW – WETLAND CONSERVATION	190
SW – ABOUT SW WETLANDS	222
SW – TRAIL MAP	181
SW – VIEWING WILDLIFE	192
SW – MAMMALS	183
SW – BIRDS	203

SW – INSECTS	193
SW – PLANTS	193
SW – REPTILES	171
SW – ANSWERS/GLOSSARY	196
SW – INSIDE/BACK COVERS	192

DD = *Da Drops*

\*September 1, 2013-May 20, 2014

OWF = *Our Water, Our Future*

TT = *Tucson Toolkit*

NOTE: *El Tour de Agua* Pilot Materials are not linked to the downloader counter. After the pilot is finished and the materials have been revised, they will be linked for the start of next school year.

## APPENDIX B

### Tucson Water Outreach Education Summary Report: Autumn 2013

#### Summary

In Autumn 2013, The Environmental Education Exchange presented a total of **137 Da Drops** and **73 Our Water, Our Future** programs to a total of **5,339 students at 56 schools**. The *Tucson Toolkit* was delivered to **2 schools** to a total of **370 students**. In total, **5,709 students in 58 schools** were reached by all three outreach programs. In addition, **4** special events were attended.

<b>Da Drops</b>	
Autumn 2013 Presentations:	<b>137 Total</b>
1 <sup>st</sup> Grade:	804 students
2 <sup>nd</sup> Grade:	1369 students
3 <sup>rd</sup> Grade:	1186 students
Other ( 1 <sup>st</sup> /2 <sup>nd</sup> , 2 <sup>nd</sup> /3 <sup>rd</sup> ):	135 students
<b>Total Students:</b>	<b>3494 students reached</b>
<b>Total Schools:</b>	<b>43 schools visited</b>

#### Schools visited

TUSD: Bloom, Booth-Fickett, Borman, Borton, Carrillo, Cavett, Cragin, Davidson, Dietz, Erickson, Ford, Grijalva, Hudlow, Hughes, Kellond, Lawrence, Maldonado, Marshall, Miller, Pueblo Gardens, Robins, Roskruge, Sewell, Tully, Vesey, Whitmore, and Wright Elementary Schools

AMPHI: Harelson and Nash Elementary Schools

CFSD: Canyon View, Sunrise Drive, and Ventana Vista Elementary Schools

MUSD: Desert Winds, Estes, Ironwood and Thornydale Elementary Schools

SUSD: Elvira Elementary School

VUSD: Desert Willow Elementary School

CHARTER: Academy of Tucson Elementary School, Carden of Tucson, Sonoran Science Academy-Sunset

PRIVATE: Our Mother of Sorrows Catholic School, Tucson Hebrew Academy

<b>Our Water, Our Future</b>	
Autumn 2013 Presentations:	<b>73 Total</b>
4 <sup>th</sup> Grade:	1397 students
5 <sup>th</sup> Grade:	389 students
Other (3 <sup>rd</sup> , 4 <sup>th</sup> /5 <sup>th</sup> ):	59 students
<b>Total Students:</b>	<b>1845 students reached</b>
<b>Total Schools:</b>	<b>25 schools visited</b>

#### Schools visited

TUSD: Borman, Cragin, Ford, Gale, Henry, Hollinger, Manzo, Pueblo Gardens, and Tully Elementary Schools

AMPHI: Harelson, Holaway, Nash Elementary and Coronado K-8 Schools

CFSD: Canyon View, Manzanita, Sunrise Drive, and Ventana Vista Elementary Schools

FWUSD: Hendricks and Richardson Elementary Schools

MUSD: Quail Run and Thornydale Elementary Schools

TVUSD: Agua Caliente Elementary School

CHARTER: Academy of Tucson Elementary School, Children Reaching for the Sky, Children's Success Academy

## **Tucson Toolkit**

Autumn 2013:

**3 teachers/2 schools**

**Total:**

**370 students reached**

### **Schools participating:**

TUSD: Valencia Middle School (2 teachers – 6<sup>th</sup> grade)

VUSD: Civano Community School (1 teacher – 6<sup>th</sup>-8<sup>th</sup> grade)

### **Highlights:**

1. Debbie Gevirtzman continues to be the Outreach Education Coordinator.
2. Torran Anderson and Cassie Mason returned as presenters. Claudia Diaz-Combs and Julie Strom were hired as new presenters. In addition, one of our energy program presenters, Brian Stark, has returned and occasionally does *Our Water, Our Future* presentations when needed.
3. On August 26, new presenters attended a 2-hour *Da Drops* training, and on September 23, new and returning presenters attended a 2-hour *Our Water, Our Future* training.
4. On August 28, new and returning presenters attended a 2-hour training to learn/review about the logistics of being a presenter, including discussions on the contents of the training notebook, pay and time sheets, transportation, kit storage and supplies, the scheduling website, and classroom management.
5. *Our Water, Our Future* revisions were wrapped up and presentations of the new and improved program began in October. The script was revised, the activity book was printed, and the new artwork from the activity book was incorporated into the presentation and the pre/post-visit materials. In addition, the pre/post-visit materials were revised and re-formatted for a fresh look, more user-friendly lessons, and updated information. Also, the on-line evaluation form was updated to match the changes in the program.

6. The number of *Da Drops* programs presented in Autumn 2013 (137) decreased slightly from Autumn 2012 (142), with a slight decrease in number of schools (5), and slight decrease (25) in number of students. *Our Water, Our Future* decreased by 12 programs and 274 students, but increased by 4 schools. (Remember that *Our Water, Our Future* did not begin presentations until October this year as revisions were being completed.)

7. In Autumn 2013, 2 fewer teachers at the same number of schools, and 180 additional students used the *Tucson Toolkit* than in Autumn 2012. Project WET is distributing the *Toolkit* to 6<sup>th</sup> grade teachers in TUSD and FWUSD who participate in their in-class presentation, so the overall total use may be higher.
8. The total number of students reached by *Da Drops, Our Water, Our Future* and the *Tucson Toolkit* decreased in Autumn 2013 (219 fewer students), and the number of schools decreased slightly (6) as compared to Autumn 2012. (Keep in mind that *Our Water, Our Future* did not begin presentations until October this year, additional teachers/students are using the *Toolkit* via deliveries from Project WET, and some schools previously scheduling *Da Drops* are now scheduling a version developed for the Oro Valley Water Utility.)
9. Teachers have already scheduled 132 *Da Drops* programs and 53 *Our Water, Our Future* programs for the spring. Last year at this time, 152 *Da Drops* programs and 56 *Our Water, Our Future* programs had been scheduled for the spring. Approximately 56 water programs (out of 450) remain to be scheduled, as compared with 15 at this time last year.
10. The programs continue to receive extremely positive feedback on evaluation forms and from direct communication with teachers.

11. Curriculum activities for *Da Drops*, *Our Water, Our Future* and the *Tucson Toolkit* continue to be downloaded from the website, even during the summer when no programs occur. During Autumn 2013, the number of downloads exceeded the number of presentations, suggesting that there are teachers interested in the lessons without having classroom presentations. The *Sweetwater Wetlands Activity Book and Field Guide* also continues to be downloaded. (See download tables below.)

12. Our partnership with Project WET has changed. During a meeting on September 3, it was determined that EEExchange would no longer schedule any Sweetwater Wetlands field trips. In addition, *Da Drops* is no longer a pre-requisite for the field trip.

13. EEExchange is currently developing a middle school water program including classroom presentations.

### Special Events – Autumn 2013

Date	Time	Event
10/19/2013	5:00-9:00pm	Discovery Night at Biosphere 2
10/20/2013	10:00am-2:00pm	Envision Tucson Sustainable Festival at Reid Park
11/7 & 8/2013	9:00 am-1:00 pm	Math, Science and Technology Funfest at TCC
11/21/2013	6:00-8:00 pm	Rattlesnake Ridge Elementary School Science Night

### Water Curricula Downloaded – Autumn 2014

Water Curricula Downloaded	Summer 2013*	Autumn 2013**
DD - COMPLETE	142	154
DD - ACTIVITY 1	137	141
DD - ACTIVITY 2	237	216
DD - ACTIVITY 3	181	178
DD - PRELIMINARY INFO	110	115
DD - ADE STANDARDS	94	103
REVISED OWF - COMPLETE		97
REVISED OWF - LESSON 1		86
REVISED OWF - LESSON 2		107
REVISED OWF - LESSON 3		71
REVISED OWF - LESSON 4		97
REVISED OWF – TEACHER LETTER		73
REVISED OWF - VOCABULARY		71
REVISED OWF - ADE STANDARDS		93
OWF - COMPLETE	100	67
OWF - LESSON 1	249	182
OWF - LESSON 2	28	249
OWF - LESSON 3	291	221
OWF - LESSON 4	474	567
OWF - PRELIMINARY INFO	97	61
OWF - ADE STANDARDS	105	62
TT - COMPLETE	185	121
TT - UNIT 1	130	150
TT - UNIT 2	87	84
TT - UNIT 3	93	90

TT - UNIT 4	92	80
TT - UNIT 5	82	106
TT - ADDITIONAL INFO	77	87
TT - ADE STANDARDS	148	84
SW - COMPLETE	82	82
SW – FRONT COVERS, WELCOME	71	83
SW – WATER CYCLE	70	90
SW – INTRO TO WETLANDS	68	84
SW – WETLAND ECOLOGY	67	84
SW – WETLAND CONSERVATION	67	84
SW – ABOUT SW WETLANDS	60	79
SW – TRAIL MAP	55	78
SW – VIEWING WILDLIFE	62	77
SW – MAMMALS	62	84
SW – BIRDS	59	84
SW – INSECTS	64	83
SW – PLANTS	68	71
SW – REPTILES	67	69
SW – ANSWERS/GLOSSARY	71	82
SW – INSIDE/BACK COVERS	68	78

DD = *Da Drops*

OWF = *Our Water, Our Future*

TT = *Tucson Toolkit*

SW = *Sweetwater Wetlands Activity Book and Field Guide*

\*June 1-Aug. 31, 2013 \*\*Sept. 1-Dec. 19, 2013

Note: Revised OWF curricula files were posted online in late September, 2013

## APPENDIX C

### Tucson Water Outreach Education Summary Report: Spring 2014

#### Summary

In Spring 2014, The Environmental Education Exchange presented a total of **156 *Da Drops*** and **97 *Our Water, Our Future*** programs to a total of **6,519 students at 65 schools**. The *Tucson Toolkit* was delivered to **2 schools to 145 students**. In addition, **50 *El Tour de Agua*** pilot programs were presented to **1,443 students**. In total, **8,107 students in 71 schools** were reached by all four outreach programs.

<b>Da Drops</b>	
Spring 2014 Presentations:	<b>156 Total</b>
1 <sup>st</sup> Grade:	1260 students
2 <sup>nd</sup> Grade:	831 students
3 <sup>rd</sup> Grade:	1518 students
Other (K-2 <sup>nd</sup> , 1 <sup>st</sup> /2 <sup>nd</sup> , 1 <sup>st</sup> -3 <sup>rd</sup> , 3 <sup>rd</sup> /4 <sup>th</sup> ):	312 students
<b>Total Students:</b>	<b>3921 students reached</b>
<b>Total Schools:</b>	<b>43 schools visited</b>

#### Schools visited

TUSD: Banks, Blenman, Bloom, Booth-Fickett, Borman, Borton, Collier, Drachman, Erickson, Fruchthendler, Henry, Hollinger, Howell, Kellond, Lineweaver, Lynn-Urquides, Marshall, McCorkle, Miles, Mission View, Oyama, Roskruge, Safford, Soleng Tom, Tully, Van Buskirk, Wheeler, White, Whitmore, and Wright Elementary Schools  
AMPHI: Rio Vista Elementary School  
CFSD: Ventana Vista Elementary School  
FWUSD: Hendricks and Homer Davis Elementary Schools  
MUSD: Coyote Trail, Rattlesnake Ridge, Roadrunner, Thornydale, and Twin Peaks Elementary Schools  
TVUSD: Agua Caliente and Tanque Verde Elementary Schools  
VUSD: Desert Willow Elementary School  
CHARTER: Academy of Math and Science

<b>Our Water, Our Future</b>	
Spring 2014 Presentations:	<b>97 Total</b>
4 <sup>th</sup> Grade:	1758 students
5 <sup>th</sup> Grade:	714 students
Other (3 <sup>rd</sup> /4 <sup>th</sup> , 4 <sup>th</sup> /5 <sup>th</sup> ):	126 students
<b>Total Students:</b>	<b>2598 students reached</b>
<b>Total Schools:</b>	<b>33 schools visited</b>

#### Schools visited

TUSD: Bloom, Bonillas, Booth-Fickett, Davis Bilingual, Dunham, Grijalva, Howell, Hughes, Lynn-Urquides, Lawrence, Marshall, Maxwell, Roberts/Naylor, Rose, Roskruge, Soleng Tom, Wheeler, and Wright Elementary Schools  
AMPHI: Harelson Elementary, Painted Sky Elementary, and Coronado K-8 Schools  
FWUSD: Centennial, Homer Davis, Laguna, and Richardson Elementary Schools  
MUSD: Estes, Ironwood, and Picture Rocks Elementary Schools  
TVUSD: Tanque Verde Elementary Schools  
VUSD: Acacia Elementary School

CHARTER: La Paloma Academy-Central  
PRIVATE: Immaculate Heart Academy, Santa Cruz Catholic School

<b>Tucson Toolkit</b>	
Spring 2014:	<b>5 teachers/2 schools</b>
5 <sup>th</sup> Grade:	52 students
6 <sup>th</sup> Grade:	93 students
<b>Total:</b>	<b>145 students reached</b>

**Schools participating:**

TUSD: Maxwell K-8 (2 teachers – 5<sup>th</sup> grade); McCorkle Academy of Excellence K-8 (3 teachers – 6<sup>th</sup> grade)

<b>El Tour de Agua PILOT</b>	
Spring Presentations:	<b>50 Total</b>
6 <sup>th</sup> Grade:	1443 students
<b>Total:</b>	<b>1443 students reached</b>

**Schools visited**

TUSD: Dodge Middle School (6<sup>th</sup> grade, x5); McCorkle Middle School (6<sup>th</sup> grade, x3); Pistor Middle School (6<sup>th</sup> grade, x4); Roberts/Naylor K-8 School (6<sup>th</sup> grade, x3)  
AMPHI: Coronado K-8 School (6<sup>th</sup> grade, x6); La Cima Middle School (6<sup>th</sup> grade, x6); Wilson K-8 School (6<sup>th</sup> grade, x6)  
CFSD: Orange Grove Middle School (6<sup>th</sup> grade, x7)  
MUSD: Butterfield Elementary School (6<sup>th</sup> grade, x3); Twin Peaks Elementary School (6<sup>th</sup> grade, x3)  
TVUSD: Tanque Verde Elementary School (6<sup>th</sup> grade, x4)

**Highlights:**

1. Twenty-seven fewer *Da Drops* program were presented in Spring 2014 than in Spring 2013, with a decrease in both the number of students (650) and the number of schools (10). The slight decrease in *Da Drops* programs is primarily the result of a new program developed by EEEExchange for Oro Valley Water called *Conservation Kids*, offered to 6 Oro Valley-area schools that would normally have scheduled *Da Drops*. (Also, the addition of 50 *El Tour de Agua* pilot programs to the schedule limited the number of available openings for other presentations.)
2. *Our Water, Our Future* increased by 6 programs, with an increase in both the number of students (124) and the number of schools (4).
3. *Da Drops* and *Our Water, Our Future* presentations were completely booked for the remainder of the school year as of March, 2014. The total for the 2013-2014 school year was 463 presentations.
4. In Spring 2014, the *Tucson Toolkit* was delivered to 1 additional teacher and 93 fewer students at the same number of schools as compared to Spring 2013. Project WET has been disseminating the *Tucson Toolkit* to 6<sup>th</sup> grade classrooms in TUSD/FW who schedule their water presentations, so fewer teachers have been requesting materials from EEEExchange over the past several years. This is the last year that the *Toolkit* will be distributed, although some of activities as well as the shower flow kit give-away have been incorporated into the *El Tour de Agua* middle school program.
5. The pilot of the *El Tour de Agua* middle school program began on April 25 with a Spring total of 50 presentations to 1,443 students, representing 25 teachers at 11 schools in 5 districts. Teachers have been asked to complete a detailed evaluation form; data will be tabulated and revisions will be made to the program over the summer.

6. Curriculum activities for *Da Drops, Our Water, Our Future* and the *Tucson Toolkit* continue to be downloaded from the website. Even during the spring, the number of downloads exceeds the number of presentations, suggesting that there are teachers interested in the lessons without having classroom presentations.

7. The programs continue to receive extremely positive feedback on evaluation forms and from direct communication with teachers.

### Water Curricula Downloaded – Spring 2014

Water Curricula Downloaded	Spring 2014*
DD - COMPLETE	178
DD - ACTIVITY 1	185
DD - ACTIVITY 2	210
DD - ACTIVITY 3	167
DD - PRELIMINARY INFO	148
DD - ADE STANDARDS	124
REVISED OWF - COMPLETE	205
REVISED OWF - LESSON 1	134
REVISED OWF - LESSON 2	193
REVISED OWF - LESSON 3	118
REVISED OWF - LESSON 4	152
REVISED OWF – TEACHER LETTER	136
REVISED OWF - VOCABULARY	122
REVISED OWF - ADE STANDARDS	161
OWF - COMPLETE	55
OWF - LESSON 1	70
OWF - LESSON 2	131
OWF - LESSON 3	82
OWF - LESSON 4	165
OWF - PRELIMINARY INFO	32
OWF - ADE STANDARDS	47
TT - COMPLETE	1334
TT - UNIT 1	158
TT - UNIT 2	118
TT - UNIT 3	107
TT - UNIT 4	91
TT - UNIT 5	130
TT - ADDITIONAL INFO	89
TT - ADE STANDARDS	92
SW - COMPLETE	183
SW – FRONT COVERS, WELCOME	101
SW – WATER CYCLE	166
SW – INTRO TO WETLANDS	130
SW – WETLAND ECOLOGY	753
SW – WETLAND CONSERVATION	94
SW – ABOUT SW WETLANDS	132
SW – TRAIL MAP	91

SW – VIEWING WILDLIFE	106
SW – MAMMALS	88
SW – BIRDS	107
SW – INSECTS	99
SW – PLANTS	112
SW – REPTILES	91
SW – ANSWERS/GLOSSARY	103
SW – INSIDE/BACK COVERS	102

DD = *Da Drops* \*January 1, 2013-May 20, 2014

OWF = *Our Water, Our Future*

TT = *Tucson Toolkit*

NOTE: *El Tour de Agua* Pilot Materials are not linked to the downloader counter. After the pilot is finished and the materials have been revised, they will be linked for the start of next school year.

## APPENDIX D

### Da Drops Participating Schools 2013-2014

Date	District	School	Program	Students	Grades
9/5/13 12:00	TUSD	HUGHES ELEM SCH	DD	35	3
9/5/13 13:05	TUSD	HUGHES ELEM SCH	DD	35	3
9/9/13 8:35	TUSD	SEWELL ELEM SCH	DD	30	2
9/9/13 9:35	TUSD	SEWELL ELEM SCH	DD	24	2
9/9/13 10:35	TUSD	SEWELL ELEM SCH	DD	30	2
9/10/13 8:30	MUSD	ESTES ELEM SCH	DD	25	3
9/10/13 9:45	MUSD	ESTES ELEM SCH	DD	26	3
9/11/13 9:00	MUSD	ESTES ELEM SCH	DD	26	3
9/11/13 10:10	MUSD	ESTES ELEM SCH	DD	26	3
9/11/13 12:00	MUSD	ESTES ELEM SCH	DD	26	3
9/12/13 9:00	TUSD	CRAGIN ELEM SCH	DD	30	2
9/12/13 22:05	TUSD	CRAGIN ELEM SCH	DD	29	2
9/13/13 7:50	TUSD	FORD ELEM SCH	DD	21	2
9/13/13 9:05	TUSD	FORD ELEM SCH	DD	22	2
9/13/13 10:20	TUSD	FORD ELEM SCH	DD	22	2
9/16/13 9:00	AMPHI	NASH ELEM SCH	DD	19	2
9/16/13 10:05	AMPHI	NASH ELEM SCH	DD	18	2
9/17/13 8:55	MUSD	DESERT WINDS ELEM SCH	DD	26	3
9/17/13 10:00	MUSD	DESERT WINDS ELEM SCH	DD	26	3
9/19/13 12:15	C/P	CARDEN OF TUCSON INC	DD	15	1
9/19/13 13:20	C/P	CARDEN OF TUCSON INC	DD	33	2/3
9/20/13 10:40	TUSD	BOOTH-FICKETT MATH/SCI MAG (K-8)	DD	21	2
9/20/13 12:25	TUSD	BOOTH-FICKETT MATH/SCI MAG (K-8)	DD	24	2
9/20/13 13:30	TUSD	BOOTH-FICKETT MATH/SCI MAG (K-8)	DD	24	2
9/24/13 8:55	MUSD	DESERT WINDS ELEM SCH	DD	22	3
9/24/13 10:00	MUSD	DESERT WINDS ELEM SCH	DD	22	3
9/25/13 8:30	C/P	ACAD OF TUCSON ELEM SCH	DD	30	3
9/25/13 9:35	C/P	ACAD OF TUCSON ELEM SCH	DD	30	3
9/26/13 12:00	TUSD	CAVETT ELEM SCH	DD	28	1
9/26/13 13:05	TUSD	CAVETT ELEM SCH	DD	28	2
9/27/13 8:00	TUSD	BLOOM ELEM SCH	DD	21	2
9/27/13 9:05	TUSD	BLOOM ELEM SCH	DD	22	2
9/27/13 10:10	TUSD	BLOOM ELEM SCH	DD	22	2
9/30/13 9:00	AMPHI	NASH ELEM SCH	DD	17	2
9/30/13 10:05	AMPHI	NASH ELEM SCH	DD	19	2
10/1/13 9:00	TUSD	WRIGHT ELEM SCH	DD	22	2
10/1/13 10:05	TUSD	WRIGHT ELEM SCH	DD	21	2
10/1/13 11:10	TUSD	WRIGHT ELEM SCH	DD	22	2
10/2/13 8:30	AMPHI	HARELSON ELEM SCH	DD	30	2
10/2/13 9:30	AMPHI	HARELSON ELEM SCH	DD	30	2
10/2/13 10:30	AMPHI	HARELSON ELEM SCH	DD	30	2
10/3/13 7:55	TUSD	BORMAN ELEM SCH	DD	25	1
10/3/13 9:00	TUSD	BORMAN ELEM SCH	DD	25	1

10/3/13 10:05	TUSD	BORMAN ELEM SCH	DD	25	1
10/3/13 12:15	TUSD	BORMAN ELEM SCH	DD	25	1
10/4/13 9:00	CFSD	VENTANA VISTA ELEM SCH	DD	25	1
10/4/13 11:00	CFSD	VENTANA VISTA ELEM SCH	DD	24	1
10/7/13 9:30	CFSD	SUNRISE DRIVE ELEM SCH	DD	19	1
10/7/13 10:35	CFSD	SUNRISE DRIVE ELEM SCH	DD	23	1
10/7/13 12:30	CFSD	SUNRISE DRIVE ELEM SCH	DD	22	1
10/8/13 9:30	CFSD	SUNRISE DRIVE ELEM SCH	DD	18	1
10/8/13 10:35	CFSD	SUNRISE DRIVE ELEM SCH	DD	24	1
10/9/13 12:15	C/P	OUR MOTHER OF SORROWS	DD	35	2
10/9/13 13:30	C/P	OUR MOTHER OF SORROWS	DD	31	1
10/11/13 10:30	CFSD	CANYON VIEW ELEM SCH	DD	24	1
10/11/13 12:30	CFSD	CANYON VIEW ELEM SCH	DD	26	1
10/11/13 13:35	CFSD	CANYON VIEW ELEM SCH	DD	25	1
10/14/13 8:30	VUSD	DESERT WILLOW ELEM SCH	DD	24	1
10/14/13 9:45	VUSD	DESERT WILLOW ELEM SCH	DD	24	1
10/15/13 8:30	VUSD	DESERT WILLOW ELEM SCH	DD	24	1
10/15/13 9:45	VUSD	DESERT WILLOW ELEM SCH	DD	24	1
10/17/13 8:30	TUSD	MARSHALL ELEM SCH	DD	25	3
10/17/13 9:35	TUSD	MARSHALL ELEM SCH	DD	25	3
10/18/13 8:30	VUSD	DESERT WILLOW ELEM SCH	DD	23	1
10/18/13 9:45	VUSD	DESERT WILLOW ELEM SCH	DD	23	1
10/21/13 12:30	TUSD	PUEBLO GARDENS K-8 SCH	DD	22	3
10/21/13 13:40	TUSD	PUEBLO GARDENS K-8 SCH	DD	23	3
10/22/13 12:00	MUSD	DESERT WINDS ELEM SCH	DD	33	1
10/22/13 13:00	MUSD	DESERT WINDS ELEM SCH	DD	29	1
10/23/13 12:00	MUSD	DESERT WINDS ELEM SCH	DD	23	1
10/23/13 13:00	MUSD	DESERT WINDS ELEM SCH	DD	21	1
10/24/13 12:00	TUSD	ROSKRUGE ELEM SCH	DD	25	2
10/24/13 13:05	TUSD	ROSKRUGE ELEM SCH	DD	25	2
10/29/13 8:45	TUSD	BORTON ELEM SCH	DD	30	3
10/29/13 9:50	TUSD	BORTON ELEM SCH	DD	30	3
10/29/13 10:55	TUSD	BORTON ELEM SCH	DD	30	3
10/31/13 9:30	TUSD	KELLOND ELEM SCH	DD	30	3
10/31/13 10:35	TUSD	KELLOND ELEM SCH	DD	30	3
11/1/13 9:30	TUSD	KELLOND ELEM SCH	DD	30	3
11/1/13 10:35	TUSD	KELLOND ELEM SCH	DD	30	3
11/4/13 9:00	TUSD	TULLY ELEM SCH	DD	27	2
11/4/13 10:05	TUSD	TULLY ELEM SCH	DD	26	2
11/4/13 12:00	TUSD	TULLY ELEM SCH	DD	23	2/3
11/5/13 8:30	C/P	OUR MOTHER OF SORROWS	DD	18	3
11/5/13 9:45	C/P	OUR MOTHER OF SORROWS	DD	18	3
11/6/13 8:30	SUSD	ELVIRA ELEM SCH	DD	23	1
11/6/13 9:45	SUSD	ELVIRA ELEM SCH	DD	26	1
11/7/13 9:00	TUSD	DAVIDSON ELEM SCH	DD	25	3
11/7/13 10:05	TUSD	DAVIDSON ELEM SCH	DD	22	3
11/12/13 13:00	C/P	TUCSON HEBREW ACAD	DD	20	1
11/12/13 14:05	C/P	TUCSON HEBREW ACAD	DD	20	3
11/13/13 8:30	SUSD	ELVIRA ELEM SCH	DD	27	1
11/13/13 9:45	SUSD	ELVIRA ELEM SCH	DD	26	1
11/14/13 12:15	TUSD	MILLER ELEM SCH	DD	23	2
11/14/13 13:20	TUSD	MILLER ELEM SCH	DD	24	2
11/15/13 12:15	TUSD	MILLER ELEM SCH	DD	21	2
11/15/13 13:20	TUSD	MILLER ELEM SCH	DD	25	2
11/18/13 8:30	TUSD	ERICKSON ELEM SCH	DD	26	2

11/18/13 9:35	TUSD	ERICKSON ELEM SCH	DD	24	2
11/19/13 8:00	TUSD	GRIJALVA ELEM SCH	DD	23	2
11/19/13 9:05	TUSD	GRIJALVA ELEM SCH	DD	26	2
11/19/13 10:10	TUSD	GRIJALVA ELEM SCH	DD	27	2
11/22/13 8:00	TUSD	GRIJALVA ELEM SCH	DD	26	2
11/22/13 9:05	TUSD	GRIJALVA ELEM SCH	DD	26	2
11/25/13 12:15	TUSD	LAWRENCE 3-8 SCH	DD	30	3
11/25/13 13:20	TUSD	LAWRENCE 3-8 SCH	DD	30	3
11/25/13 14:25	TUSD	LAWRENCE 3-8 SCH	DD	30	3
11/26/13 12:30	TUSD	CARRILLO MAGNET SCH	DD	26	2
11/26/13 13:35	TUSD	CARRILLO MAGNET SCH	DD	26	2
12/2/13 8:00	MUSD	IRONWOOD ELEM SCH	DD	26	3
12/2/13 9:15	MUSD	IRONWOOD ELEM SCH	DD	28	3
12/3/13 8:00	MUSD	IRONWOOD ELEM SCH	DD	27	3
12/3/13 9:15	MUSD	IRONWOOD ELEM SCH	DD	28	3
12/4/13 9:00	TUSD	HUDLOW ELEM SCH	DD	25	3
12/4/13 10:05	TUSD	HUDLOW ELEM SCH	DD	25	2/3
12/5/13 8:30	TUSD	ERICKSON ELEM SCH	DD	25	2
12/5/13 9:35	TUSD	ERICKSON ELEM SCH	DD	24	2
12/6/13 9:00	TUSD	WHITMORE ELEM SCH	DD	28	3
12/6/13 10:15	TUSD	WHITMORE ELEM SCH	DD	28	3
12/9/13 13:00	TUSD	VESEY ELEM SCH	DD	25	2
12/9/13 14:15	TUSD	VESEY ELEM SCH	DD	28	2
12/10/13 13:00	TUSD	VESEY ELEM SCH	DD	30	2
12/10/13 14:15	TUSD	VESEY ELEM SCH	DD	25	2
12/11/13 10:10	TUSD	ROBINS K-8 SCH	DD	29	3
12/11/13 12:00	TUSD	ROBINS K-8 SCH	DD	29	3
12/11/13 13:05	TUSD	ROBINS K-8 SCH	DD	29	3
12/12/13 12:00	TUSD	HUDLOW ELEM SCH	DD	30	1/2
12/12/13 13:00	TUSD	HUDLOW ELEM SCH	DD	30	1
12/13/13 9:00	C/P	SONORAN SCI ACAD - SUNSET	DD	28	2
12/13/13 10:15	C/P	SONORAN SCI ACAD - SUNSET	DD	28	2
12/16/13 8:00	TUSD	DIETZ ELEM SCH	DD	28	3
12/16/13 9:05	TUSD	DIETZ ELEM SCH	DD	28	3
12/17/13 11:55	MUSD	THORNYDALE ELEM SCH	DD	25	2
12/17/13 13:00	MUSD	THORNYDALE ELEM SCH	DD	25	2
12/19/13 0:50	TUSD	MALDONADO ELEM SCH	DD	24	1/2
12/19/13 10:00	TUSD	MALDONADO ELEM SCH	DD	23	2
12/19/13 11:45	TUSD	MALDONADO ELEM SCH	DD	24	2
1/7/14 8:55	AMPHI	RIO VISTA ELEM SCH	DD	22	1
1/7/14 10:00	AMPHI	RIO VISTA ELEM SCH	DD	23	1
1/8/14 8:55	AMPHI	RIO VISTA ELEM SCH	DD	22	1
1/8/14 10:00	AMPHI	RIO VISTA ELEM SCH	DD	23	1
1/9/14 9:00	TUSD	BLENMAN ELEM SCH	DD	23	2
1/9/14 10:05	TUSD	BLENMAN ELEM SCH	DD	22	2
1/10/14 8:00	TUSD	HENRY ELEM SCH	DD	33	2
1/10/14 9:05	TUSD	HENRY ELEM SCH	DD	33	2
1/13/14 12:00	TUSD	ROSKRUGE ELEM SCH	DD	25	3
1/13/14 13:05	TUSD	ROSKRUGE ELEM SCH	DD	24	1
1/14/14 8:30	TUSD	ERICKSON ELEM SCH	DD	27	3
1/14/14 9:40	TUSD	ERICKSON ELEM SCH	DD	30	3
1/15/14 9:00	TUSD	BLENMAN ELEM SCH	DD	23	2
1/15/14 10:05	TUSD	BLENMAN ELEM SCH	DD	22	2
1/16/14 9:00	TUSD	HOWELL ELEM SCH	DD	30	3
1/16/14 10:05	TUSD	HOWELL ELEM SCH	DD	30	3

1/17/14 8:45	FWUSD	HOMER DAVIS ELEM SCH	DD	25	2
1/17/14 10:00	FWUSD	HOMER DAVIS ELEM SCH	DD	25	2
1/17/14 11:45	FWUSD	HOMER DAVIS ELEM SCH	DD	25	2
1/21/14 8:30	TUSD	ERICKSON ELEM SCH	DD	22	3
1/21/14 9:40	TUSD	ERICKSON ELEM SCH	DD	27	3
1/22/14 9:00	TUSD	BLENMAN ELEM SCH	DD	24	1
1/22/14 10:00	TUSD	BLENMAN ELEM SCH	DD	33	1
1/22/14 11:45	TUSD	BLENMAN ELEM SCH	DD	24	1
1/23/14 9:30	TVUSD	TANQUE VERDE ELEM SCH	DD	21	2
1/23/14 10:35	TVUSD	TANQUE VERDE ELEM SCH	DD	21	2
1/24/14 9:25	FWUSD	HENDRICKS ELEM SCH	DD	34	3
1/24/14 10:30	FWUSD	HENDRICKS ELEM SCH	DD	34	3
1/27/14 9:25	TUSD	BANKS ELEM SCH	DD	33	3
1/27/14 10:30	TUSD	BANKS ELEM SCH	DD	32	3
1/28/14 12:20	TUSD	BANKS ELEM SCH	DD	21	2
1/28/14 13:25	TUSD	BANKS ELEM SCH	DD	21	2
1/29/14 9:25	TUSD	KELLOND ELEM SCH	DD	20	1
1/29/14 10:30	TUSD	KELLOND ELEM SCH	DD	28	1
1/30/14 8:30	TUSD	WHEELER ELEM SCH	DD	25	3
1/30/14 9:45	TUSD	WHEELER ELEM SCH	DD	25	3
1/30/14 11:00	TUSD	WHEELER ELEM SCH	DD	25	3
1/31/14 8:00	TUSD	WHITE ELEM SCH	DD	24	2
1/31/14 9:05	TUSD	WHITE ELEM SCH	DD	25	2
2/4/14 8:30	TUSD	VAN BUSKIRK ELEM SCH	DD	20	3
2/4/14 9:35	TUSD	VAN BUSKIRK ELEM SCH	DD	25	3
2/4/14 10:40	TUSD	VAN BUSKIRK ELEM SCH	DD	25	3
2/5/14 9:00	TUSD	BORTON ELEM SCH	DD	24	1/2
2/5/14 10:05	TUSD	BORTON ELEM SCH	DD	24	1/2
2/6/14 9:30	TVUSD	TANQUE VERDE ELEM SCH	DD	21	2
2/6/14 10:35	TVUSD	TANQUE VERDE ELEM SCH	DD	21	2
2/7/14 9:00	TUSD	LINWEAVER ELEM SCH	DD	33	3
2/7/14 10:05	TUSD	LINWEAVER ELEM SCH	DD	33	3
2/7/14 11:10	TUSD	LINWEAVER ELEM SCH	DD	34	3
2/10/14 9:00	TUSD	COLLIER ELEM SCH	DD	27	3/4
2/10/14 10:05	TUSD	COLLIER ELEM SCH	DD	28	3
2/11/14 8:40	TUSD	WRIGHT ELEM SCH	DD	20	3
2/11/14 9:45	TUSD	WRIGHT ELEM SCH	DD	30	3
2/11/14 10:50	TUSD	WRIGHT ELEM SCH	DD	30	3
2/13/14 8:00	C/P	ACAD OF MATH & SCIENCE	DD	25	3
2/13/14 9:05	C/P	ACAD OF MATH & SCIENCE	DD	22	3
2/17/14 13:00	TUSD	SAFFORD K-8 SCH	DD	20	1
2/17/14 14:05	TUSD	SAFFORD K-8 SCH	DD	21	1
2/18/14 9:00	TUSD	FRUCHTHENDLER ELEM SCH	DD	28	3
2/18/14 10:05	TUSD	FRUCHTHENDLER ELEM SCH	DD	28	3
2/25/14 9:05	TUSD	WRIGHT ELEM SCH	DD	26	1
2/25/14 10:10	TUSD	WRIGHT ELEM SCH	DD	26	1
2/25/14 11:50	TUSD	WRIGHT ELEM SCH	DD	26	1
2/26/14 9:00	TUSD	HOLLINGER ELEM SCH	DD	22	1/2
2/26/14 10:05	TUSD	HOLLINGER ELEM SCH	DD	28	2
2/27/14 9:00	MUSD	ROADRUNNER ELEM SCH	DD	27	2
2/27/14 10:05	MUSD	ROADRUNNER ELEM SCH	DD	27	2
2/28/14 9:00	CFSD	VENTANA VISTA ELEM SCH	DD	25	1/2
2/28/14 10:05	CFSD	VENTANA VISTA ELEM SCH	DD	25	1/2
2/28/14 11:10	CFSD	VENTANA VISTA ELEM SCH	DD	24	1/2
3/3/14 8:00	TUSD	WHITE ELEM SCH	DD	25	1

3/3/14 9:05	TUSD	WHITE ELEM SCH	DD	26	1
3/4/14 8:50	TUSD	SOLENG TOM ELEM SCH	DD	25	3
3/4/14 9:55	TUSD	SOLENG TOM ELEM SCH	DD	25	3
3/4/14 11:00	TUSD	SOLENG TOM ELEM SCH	DD	25	3
3/5/14 9:00	TUSD	MARSHALL ELEM SCH	DD	21	2
3/5/14 10:05	TUSD	MARSHALL ELEM SCH	DD	23	2
3/6/14 9:00	TUSD	WHITMORE ELEM SCH	DD	30	1
3/6/14 10:05	TUSD	WHITMORE ELEM SCH	DD	30	1
3/7/14 8:00	TUSD	WHITE ELEM SCH	DD	20	1
3/7/14 9:05	TUSD	WHITE ELEM SCH	DD	25	1
3/7/14 11:00	TUSD	WHITE ELEM SCH	DD	24	1
3/10/14 8:00	MUSD	TWIN PEAKS ELEM SCH	DD	23	3
3/10/14 9:05	MUSD	TWIN PEAKS ELEM SCH	DD	27	3
3/10/14 10:10	MUSD	TWIN PEAKS ELEM SCH	DD	26	3
3/12/14 9:00	TUSD	MARSHALL ELEM SCH	DD	27	1
3/12/14 10:05	TUSD	MARSHALL ELEM SCH	DD	23	1
3/13/14 8:00	TUSD	BORMAN ELEM SCH	DD	26	3
3/13/14 9:05	TUSD	BORMAN ELEM SCH	DD	26	3
3/13/14 10:10	TUSD	BORMAN ELEM SCH	DD	26	3
3/17/14 9:50	CFSD	VENTANA VISTA ELEM SCH	DD	19	2
3/17/14 11:05	CFSD	VENTANA VISTA ELEM SCH	DD	19	2
3/24/14 13:30	TUSD	MCCORKLE PREK-8 SCH	DD	17	2
3/24/14 14:35	TUSD	MCCORKLE PREK-8 SCH	DD	18	2
3/25/14 8:40	TUSD	MISSION VIEW ELEM SCH	DD	25	3
3/25/14 9:45	TUSD	MISSION VIEW ELEM SCH	DD	25	3
3/25/14 10:50	TUSD	MISSION VIEW ELEM SCH	DD	25	3
3/27/14 10:10	TUSD	SOLENG TOM ELEM SCH	DD	28	1/2
3/27/14 12:00	TUSD	SOLENG TOM ELEM SCH	DD	31	1
3/27/14 13:05	TUSD	SOLENG TOM ELEM SCH	DD	31	1
3/28/14 12:00	TUSD	DRACHMAN MONT MAG SCH	DD	28	1-3
3/28/14 13:05	TUSD	DRACHMAN MONT MAG SCH	DD	28	1-3
4/4/14 10:00	TUSD	VAN BUSKIRK ELEM SCH	DD	24	1
4/4/14 12:00	TUSD	VAN BUSKIRK ELEM SCH	DD	29	1
4/4/14 13:05	TUSD	VAN BUSKIRK ELEM SCH	DD	23	1
4/7/14 8:50	TUSD	LYNN-URQUIDES ELEM SCH	DD	22	1
4/7/14 9:55	TUSD	LYNN-URQUIDES ELEM SCH	DD	22	1
4/7/14 11:40	TUSD	LYNN-URQUIDES ELEM SCH	DD	22	1
4/9/14 8:30	TUSD	LYNN-URQUIDES ELEM SCH	DD	22	1
4/9/14 9:35	TUSD	LYNN-URQUIDES ELEM SCH	DD	22	1
4/10/14 12:00	TUSD	ROSKRUGE ELEM SCH	DD	23	1
4/10/14 13:05	TUSD	ROSKRUGE ELEM SCH	DD	22	1
4/11/14 8:00	MUSD	RATTLESNAKE RIDGE ELEM SCH	DD	19	2
4/11/14 9:05	MUSD	RATTLESNAKE RIDGE ELEM SCH	DD	20	2
4/14/14 8:55	MUSD	COYOTE TRAIL ELEM SCH	DD	22	1
4/14/14 10:00	MUSD	COYOTE TRAIL ELEM SCH	DD	22	1
4/15/14 8:55	MUSD	COYOTE TRAIL ELEM SCH	DD	20	1
4/15/14 10:00	MUSD	COYOTE TRAIL ELEM SCH	DD	22	1
4/16/14 11:55	MUSD	THORNYDALE ELEM SCH	DD	24	3
4/16/14 13:00	MUSD	THORNYDALE ELEM SCH	DD	22	3
4/17/14 10:05	TUSD	OYAMA ELEM SCH	DD	27	1
4/17/14 11:50	TUSD	OYAMA ELEM SCH	DD	27	1
4/17/14 12:55	TUSD	OYAMA ELEM SCH	DD	26	1
4/18/14 8:00	MUSD	RATTLESNAKE RIDGE ELEM SCH	DD	25	2
4/18/14 9:05	MUSD	RATTLESNAKE RIDGE ELEM SCH	DD	25	2
4/21/14 8:30	TUSD	HENRY ELEM SCH	DD	26	3

4/21/14 9:35	TUSD	HENRY ELEM SCH	DD	23	3
4/21/14 10:40	TUSD	HENRY ELEM SCH	DD	30	3
4/23/14 9:00	TUSD	BLOOM ELEM SCH	DD	26	3
4/23/14 10:05	TUSD	BLOOM ELEM SCH	DD	27	3
4/25/14 9:15	TUSD	BOOTH-FICKETT MATH/SCI MAG	DD	23	1
4/25/14 10:20	TUSD	BOOTH-FICKETT MATH/SCI MAG	DD	24	1
4/25/14 12:10	TUSD	BOOTH-FICKETT MATH/SCI MAG	DD	24	1
4/28/14 8:45	AMPHI	RIO VISTA ELEM SCH	DD	26	3
4/28/14 9:50	AMPHI	RIO VISTA ELEM SCH	DD	25	3
4/28/14 10:55	AMPHI	RIO VISTA ELEM SCH	DD	26	3
4/29/14 12:00	TUSD	TULLY ELEM SCH	DD	24	3
4/29/14 13:05	TUSD	TULLY ELEM SCH	DD	27	3
5/2/14 9:20	TUSD	HOWELL ELEM SCH	DD	22	2
5/2/14 10:25	TUSD	HOWELL ELEM SCH	DD	24	2
5/2/14 12:10	TUSD	HOWELL ELEM SCH	DD	20	2
5/6/14 12:30	TUSD	MILES EXPL LRNG CNTR K-8	DD	29	K-2
5/6/14 13:35	TUSD	MILES EXPL LRNG CNTR K-8	DD	28	1-3
5/7/14 12:15	VUSD	DESERT WILLOW ELEM SCH	DD	27	3
5/7/14 13:20	VUSD	DESERT WILLOW ELEM SCH	DD	26	3
5/8/14 12:15	VUSD	DESERT WILLOW ELEM SCH	DD	37	3
5/8/14 13:20	VUSD	DESERT WILLOW ELEM SCH	DD	38	3
5/9/14 8:30	TVUSD	AGUA CALIENTE ELEM SCH	DD	23	2
5/9/14 9:30	TVUSD	AGUA CALIENTE ELEM SCH	DD	24	2
5/9/14 10:30	TVUSD	AGUA CALIENTE ELEM SCH	DD	24	2
5/15/14 8:30	TUSD	FRUCHTHENDLER EL SCH	DD	24	1
5/15/14 9:30	TUSD	FRUCHTHENDLER EL SCH	DD	24	1
5/15/14 22:30	TUSD	FRUCHTHENDLER EL SCH	DD	24	1
5/19/14 11:45	TUSD	TULLY ELEM SCH	DD	24	1
5/19/14 12:45	TUSD	TULLY ELEM SCH	DD	17	1
5/19/14 13:45	TUSD	TULLY ELEM SCH	DD	25	1

DD = *Da Drops*

## APPENDIX E

### *Our Water, Our Future* Participating Schools 2013-2014

Date	District	School	Program	Students	Grades
10/3/13 8:40	AMPHI	HARELSON ELEM SCH	OWOF	24	4
10/3/13 9:45	AMPHI	HARELSON ELEM SCH	OWOF	25	4
10/3/13 10:50	AMPHI	HARELSON ELEM SCH	OWOF	26	4
10/10/13 10:10	AMPHI	NASH ELEM SCH	OWOF	20	4
10/10/13 11:25	AMPHI	NASH ELEM SCH	OWOF	20	4
10/11/13 10:10	AMPHI	NASH ELEM SCH	OWOF	30	4
10/11/13 11:25	AMPHI	NASH ELEM SCH	OWOF	20	4
10/15/13 8:05	CFSD	MANZANITA ELEM SCH	OWOF	28	4
10/15/13 9:10	CFSD	MANZANITA ELEM SCH	OWOF	28	4
10/16/13 8:05	CFSD	MANZANITA ELEM SCH	OWOF	28	4
10/16/13 9:10	CFSD	MANZANITA ELEM SCH	OWOF	28	4
10/16/13 10:15	CFSD	MANZANITA ELEM SCH	OWOF	26	4
10/17/13 8:00	MUSD	QUAIL RUN ELEM SCH	OWOF	28	4
10/17/13 9:05	MUSD	QUAIL RUN ELEM SCH	OWOF	28	4
10/17/13 10:10	MUSD	QUAIL RUN ELEM SCH	OWOF	23	4
10/18/13 9:30	C/P	CHILDREN'S SUCCESS ACAD	OWOF	10	3
10/18/13 10:35	C/P	CHILDREN'S SUCCESS ACAD	OWOF	19	4/5
10/21/13 10:55	C/P	ACAD OF TUCSON ELEM SCH	OWOF	25	4
10/21/13 12:50	C/P	ACAD OF TUCSON ELEM SCH	OWOF	26	4
10/22/13 9:00	MUSD	THORNYDALE ELEM SCH	OWOF	25	4
10/22/13 10:05	MUSD	THORNYDALE ELEM SCH	OWOF	25	4
10/25/13 8:45	TUSD	MANZO ELEM SCH	OWOF	27	4
10/25/13 9:50	TUSD	MANZO ELEM SCH	OWOF	26	5
10/28/13 9:55	TUSD	TULLY ELEM SCH	OWOF	30	4/5
10/28/13 11:00	TUSD	TULLY ELEM SCH	OWOF	19	5
10/29/13 9:55	TUSD	TULLY ELEM SCH	OWOF	26	4
10/29/13 11:00	TUSD	TULLY ELEM SCH	OWOF	18	5
10/29/13 12:30	TUSD	TULLY ELEM SCH	OWOF	26	4
10/30/13 8:15	TUSD	FORD ELEM SCH	OWOF	29	4
10/30/13 9:20	TUSD	FORD ELEM SCH	OWOF	29	4
11/1/13 9:10	FWUSD	HENDRICKS ELEM SCH	OWOF	28	4
11/1/13 10:15	FWUSD	HENDRICKS ELEM SCH	OWOF	28	4
11/1/13 12:15	FWUSD	HENDRICKS ELEM SCH	OWOF	28	4
11/4/13 12:30	C/P	CHILDREN REACH FOR SKY	OWOF	20	4
11/4/13 13:35	C/P	CHILDREN REACH FOR SKY	OWOF	20	4
11/5/13 9:45	TUSD	BORMAN ELEM SCH	OWOF	25	5
11/5/13 10:50	TUSD	BORMAN ELEM SCH	OWOF	25	5
11/12/13 8:00	TUSD	HENRY ELEM SCH	OWOF	30	5
11/12/13 9:05	TUSD	HENRY ELEM SCH	OWOF	30	5
11/14/13 8:15	CFSD	VENTANA VISTA ELEM SCH	OWOF	27	4
11/14/13 9:20	CFSD	VENTANA VISTA ELEM SCH	OWOF	26	4
11/14/13 10:25	CFSD	VENTANA VISTA ELEM SCH	OWOF	25	4
11/18/13 8:45	TUSD	HOLLINGER ELEM SCH	OWOF	20	4
11/18/13 9:50	TUSD	HOLLINGER ELEM SCH	OWOF	22	4
11/18/13 10:55	TUSD	HOLLINGER ELEM SCH	OWOF	26	4
11/19/13 8:45	TUSD	HOLLINGER ELEM SCH	OWOF	26	5
11/19/13 9:50	TUSD	HOLLINGER ELEM SCH	OWOF	25	5
12/2/13 12:05	FWUSD	RICHARDSON ELEM SCH	OWOF	25	5
12/2/13 13:10	FWUSD	RICHARDSON ELEM SCH	OWOF	27	5
12/3/13 10:00	CFSD	SUNRISE DRIVE ELEM SCH	OWOF	25	4

12/3/13 11:05	CFSD	SUNRISE DRIVE ELEM SCH	OWOF	25	4
12/5/13 8:45	TUSD	GALE ELEM SCH	OWOF	30	4
12/5/13 10:00	TUSD	GALE ELEM SCH	OWOF	30	4
12/6/13 10:00	CFSD	SUNRISE DRIVE ELEM SCH	OWOF	24	4
12/6/13 11:05	CFSD	SUNRISE DRIVE ELEM SCH	OWOF	25	4
12/9/13 9:00	TUSD	PUEBLO GARDENS K-8 SCH	OWOF	30	5
12/9/13 10:05	TUSD	PUEBLO GARDENS K-8 SCH	OWOF	30	5
12/10/13 8:40	TVUSD	AGUA CALIENTE ELEM SCH	OWOF	26	4
12/10/13 9:45	TVUSD	AGUA CALIENTE ELEM SCH	OWOF	27	4
12/10/13 10:50	TVUSD	AGUA CALIENTE ELEM SCH	OWOF	27	4
12/12/13 8:00	TUSD	CRAGIN ELEM SCH	OWOF	25	4
12/12/13 9:05	TUSD	CRAGIN ELEM SCH	OWOF	25	5
12/13/13 10:20	TUSD	CRAGIN ELEM SCH	OWOF	25	4
12/13/13 12:15	TUSD	CRAGIN ELEM SCH	OWOF	28	5
12/16/13 10:15	AMPHI	CORONADO K-8 SCH	OWOF	25	4
12/16/13 12:05	AMPHI	CORONADO K-8 SCH	OWOF	25	4
12/16/13 13:15	AMPHI	CORONADO K-8 SCH	OWOF	25	4
12/17/13 9:45	CFSD	CANYON VIEW ELEM SCH	OWOF	26	4
12/17/13 11:00	CFSD	CANYON VIEW ELEM SCH	OWOF	27	4
12/18/13 9:00	AMPHI	HOLAWAY ELEM SCH	OWOF	20	4
12/18/13 10:15	AMPHI	HOLAWAY ELEM SCH	OWOF	20	4
12/19/13 9:45	CFSD	CANYON VIEW ELEM SCH	OWOF	25	4
12/19/13 11:00	CFSD	CANYON VIEW ELEM SCH	OWOF	25	4
1/10/14 12:10	FWUSD	LAGUNA ELEM SCH	OWOF	28	5
1/10/14 13:10	FWUSD	LAGUNA ELEM SCH	OWOF	30	5
1/14/14 7:55	TUSD	BLOOM ELEM SCH	OWOF	29	4
1/14/14 9:00	TUSD	BLOOM ELEM SCH	OWOF	27	4
1/14/14 10:20	TUSD	BLOOM ELEM SCH	OWOF	29	4/5
1/21/14 8:00	MUSD	PICTURE ROCKS ELEM SCH	OWOF	25	4
1/21/14 9:15	MUSD	PICTURE ROCKS ELEM SCH	OWOF	26	4
1/22/14 8:30	MUSD	PICTURE ROCKS ELEM SCH	OWOF	23	4
1/22/14 9:45	MUSD	PICTURE ROCKS ELEM SCH	OWOF	24	4
1/23/14 9:00	TUSD	ROBERTS/NAYLOR K-8 SCH	OWOF	24	4/5
1/23/14 10:05	TUSD	ROBERTS/NAYLOR K-8 SCH	OWOF	29	4
1/23/14 11:10	TUSD	ROBERTS/NAYLOR K-8 SCH	OWOF	26	3/4
1/23/14 12:35	TUSD	ROBERTS/NAYLOR K-8 SCH	OWOF	27	5
1/27/14 9:00	TUSD	WHEELER ELEM SCH	OWOF	30	5
1/27/14 10:05	TUSD	WHEELER ELEM SCH	OWOF	30	5
1/28/14 7:55	TUSD	BLOOM ELEM SCH	OWOF	24	5
1/28/14 9:00	TUSD	BLOOM ELEM SCH	OWOF	23	5
1/29/14 8:00	TUSD	MARSHALL ELEM SCH	OWOF	23	5
1/29/14 9:05	TUSD	MARSHALL ELEM SCH	OWOF	23	5
1/29/14 10:10	TUSD	MARSHALL ELEM SCH	OWOF	17	5
1/31/14 9:35	TUSD	LAWRENCE 3-8 SCH	OWOF	26	4
1/31/14 10:40	TUSD	LAWRENCE 3-8 SCH	OWOF	26	4
1/31/14 12:25	TUSD	LAWRENCE 3-8 SCH	OWOF	25	4
2/3/14 10:00	TVUSD	TANQUE VERDE ELEM SCH	OWOF	26	4
2/3/14 11:05	TVUSD	TANQUE VERDE ELEM SCH	OWOF	26	4
2/4/14 10:10	TUSD	LYNN-URQUIDES ELEM SCH	OWOF	29	4
2/4/14 11:15	TUSD	LYNN-URQUIDES ELEM SCH	OWOF	26	4
2/6/14 10:10	TUSD	LYNN-URQUIDES ELEM SCH	OWOF	20	4
2/6/14 11:15	TUSD	LYNN-URQUIDES ELEM SCH	OWOF	20	4/5
2/7/14 9:10	TUSD	BOOTH-FICKETT MAG (K-8)	OWOF	28	4
2/7/14 10:15	TUSD	BOOTH-FICKETT MAG (K-8)	OWOF	29	4
2/7/14 11:20	TUSD	BOOTH-FICKETT MAG (K-8)	OWOF	28	4

2/10/14 10:00	TVUSD	TANQUE VERDE ELEM SCH	OWOF	26	4
2/10/14 11:05	TVUSD	TANQUE VERDE ELEM SCH	OWOF	26	4
2/11/14 8:50	C/P	LA PALOMA ACAD-CENTRAL	OWOF	30	4
2/11/14 9:55	C/P	LA PALOMA ACAD-CENTRAL	OWOF	30	4
2/11/14 11:00	C/P	LA PALOMA ACAD-CENTRAL	OWOF	30	4
2/12/14 10:40	FWUSD	RICHARDSON ELEM SCH	OWOF	30	4
2/12/14 12:30	FWUSD	RICHARDSON ELEM SCH	OWOF	30	4
2/13/14 12:15	VUSD	ACACIA ELEM SCH	OWOF	32	4
2/13/14 13:30	VUSD	ACACIA ELEM SCH	OWOF	32	4
2/17/14 8:45	TUSD	WRIGHT ELEM SCH	OWOF	21	4
2/17/14 9:50	TUSD	WRIGHT ELEM SCH	OWOF	23	4
2/17/14 10:55	TUSD	WRIGHT ELEM SCH	OWOF	21	4
2/18/14 10:30	TUSD	DUNHAM ELEM SCH	OWOF	27	3/4
2/18/14 12:00	TUSD	DUNHAM ELEM SCH	OWOF	22	4
2/18/14 13:00	TUSD	DUNHAM ELEM SCH	OWOF	28	5
2/19/14 9:00	TUSD	ROSKRUGE ELEM SCH	OWOF	27	5
2/19/14 10:15	TUSD	ROSKRUGE ELEM SCH	OWOF	27	5
2/25/14 9:30	C/P	IMMACULATE HEART ACAD	OWOF	17	4
2/25/14 10:35	C/P	IMMACULATE HEART ACAD	OWOF	15	4
2/26/14 9:00	TUSD	MAXWELL K-8 SCH	OWOF	26	5
2/26/14 10:05	TUSD	MAXWELL K-8 SCH	OWOF	26	5
2/26/14 11:10	TUSD	MAXWELL K-8 SCH	OWOF	23	5
2/28/14 9:00	TUSD	DAVIS BILINGUAL ELEM SCH	OWOF	27	4
2/28/14 10:15	TUSD	DAVIS BILINGUAL ELEM SCH	OWOF	27	4
3/4/14 12:15	VUSD	ACACIA ELEM SCH	OWOF	32	4
3/4/14 13:30	VUSD	ACACIA ELEM SCH	OWOF	32	4
3/6/14 9:00	AMPHI	PAINTED SKY ELEM SCH	OWOF	29	4
3/6/14 10:05	AMPHI	PAINTED SKY ELEM SCH	OWOF	29	4
3/6/14 11:10	AMPHI	PAINTED SKY ELEM SCH	OWOF	29	4
3/7/14 9:00	AMPHI	PAINTED SKY ELEM SCH	OWOF	29	4
3/7/14 10:05	AMPHI	PAINTED SKY ELEM SCH	OWOF	29	4
3/11/14 9:00	TUSD	HUGHES, SAM ELEM SCH	OWOF	32	4
3/11/14 10:05	TUSD	HUGHES, SAM ELEM SCH	OWOF	32	4
3/13/14 9:00	TUSD	HOWELL ELEM SCH	OWOF	27	4
3/13/14 10:30	TUSD	HOWELL ELEM SCH	OWOF	26	4
3/24/14 7:45	MUSD	IRONWOOD ELEM SCH	OWOF	27	4
3/24/14 8:50	MUSD	IRONWOOD ELEM SCH	OWOF	26	4
3/25/14 8:00	MUSD	ESTES ELEM SCH	OWOF	30	4
3/25/14 9:15	MUSD	ESTES ELEM SCH	OWOF	30	4
3/26/14 8:00	MUSD	ESTES ELEM SCH	OWOF	30	4
3/26/14 9:15	MUSD	ESTES ELEM SCH	OWOF	30	4
3/27/14 7:45	MUSD	IRONWOOD ELEM SCH	OWOF	27	4
3/27/14 8:50	MUSD	IRONWOOD ELEM SCH	OWOF	27	4
3/28/14 9:50	TUSD	BONILLAS BASIC CUR EL SCH	OWOF	35	5
3/28/14 11:00	TUSD	BONILLAS BASIC CUR EL SCH	OWOF	31	5
4/14/14 8:00	AMPHI	CORONADO K-8 SCH	OWOF	26	5
4/14/14 9:05	AMPHI	CORONADO K-8 SCH	OWOF	26	5
4/14/14 10:30	AMPHI	CORONADO K-8 SCH	OWOF	26	5
4/22/14 10:05	TUSD	GRIJALVA ELEM SCH	OWOF	32	5
4/25/14 8:15	FWUSD	CENTENNIAL ELEM SCH	OWOF	27	4
4/25/14 9:20	FWUSD	CENTENNIAL ELEM SCH	OWOF	29	4
4/28/14 8:40	TUSD	SOLENG TOM ELEM SCH	OWOF	26	4
4/28/14 9:40	TUSD	SOLENG TOM ELEM SCH	OWOF	26	4
4/28/14 10:40	TUSD	SOLENG TOM ELEM SCH	OWOF	26	4
4/30/14 13:00	C/P	SANTA CRUZ CATHOLIC SCH	OWOF	25	4

4/30/14 14:05	C/P	SANTA CRUZ CATHOLIC SCH	OWOF	26	5
5/1/14 9:00	TUSD	ROSE K-8 SCH	OWOF	30	4
5/1/14 10:05	TUSD	ROSE K-8 SCH	OWOF	30	4
5/2/14 8:15	FWUSD	HOMER DAVIS ELEM SCH	OWOF	25	4
5/2/14 9:20	FWUSD	HOMER DAVIS ELEM SCH	OWOF	25	4
5/2/14 10:25	FWUSD	HOMER DAVIS ELEM SCH	OWOF	25	4
5/12/14 8:45	AMPHI	HARELSON ELEM SCH	OWOF	24	5
5/12/14 9:50	AMPHI	HARELSON ELEM SCH	OWOF	25	5
5/12/14 10:55	AMPHI	HARELSON ELEM SCH	OWOF	25	5

OWOF = *Our Water, Our Future*

## APPENDIX F

### *El Tour de Agua* Participating Schools PILOT Spring 2014

Date	District	School	Program	Students	Grades
4/25/14 8:00	MUSD	TWIN PEAKS ELEM SCH	ETDA	24	6
4/25/14 9:05	MUSD	TWIN PEAKS ELEM SCH	ETDA	28	6
4/25/14 10:10	MUSD	TWIN PEAKS ELEM SCH	ETDA	28	6
4/28/14 8:00	MUSD	BUTTERFIELD ELEM SCH	ETDA	29	6
4/28/14 9:00	MUSD	BUTTERFIELD ELEM SCH	ETDA	26	6
4/28/14 10:00	MUSD	BUTTERFIELD ELEM SCH	ETDA	27	6
5/5/14 10:00	TUSD	PISTOR MIDDLE SCHOOL	ETDA	24	6
5/5/14 11:39	TUSD	PISTOR MIDDLE SCHOOL	ETDA	23	6
5/5/14 12:43	TUSD	PISTOR MIDDLE SCHOOL	ETDA	28	6
5/5/14 13:47	TUSD	PISTOR MIDDLE SCHOOL	ETDA	25	6
5/6/14 8:20	AMPHI	CORONADO K-8	ETDA	32	6
5/6/14 9:46	AMPHI	CORONADO K-8	ETDA	32	6
5/6/14 11:54	AMPHI	CORONADO K-8	ETDA	32	6
5/7/14 9:04	AMPHI	CORONADO K-8	ETDA	32	6
5/7/14 12:45	AMPHI	CORONADO K-8	ETDA	32	6
5/7/14 14:13	AMPHI	CORONADO K-8	ETDA	32	6
5/8/14 9:01	TUSD	DODGE MIDDLE SCH	ETDA	30	6
5/8/14 10:05	TUSD	DODGE MIDDLE SCH	ETDA	31	6
5/9/14 9:50	TUSD	MCCORKLE K-8	ETDA	32	6
5/9/14 10:55	TUSD	MCCORKLE K-8	ETDA	32	6
5/9/14 12:35	TUSD	MCCORKLE K-8	ETDA	32	6
5/12/14 12:44	TUSD	DODGE MIDDLE SCH	ETDA	31	6
5/12/14 13:47	TUSD	DODGE MIDDLE SCH	ETDA	31	6
5/12/14 14:50	TUSD	DODGE MIDDLE SCH	ETDA	27	6
5/13/14 8:25	AMPHI	LA CIMA MIDDLE SCH	ETDA	33	6
5/13/14 9:27	AMPHI	LA CIMA MIDDLE SCH	ETDA	20	6
5/13/14 10:24	AMPHI	LA CIMA MIDDLE SCH	ETDA	20	6
5/13/14 11:51	AMPHI	LA CIMA MIDDLE SCH	ETDA	28	6
5/13/14 12:48	AMPHI	LA CIMA MIDDLE SCH	ETDA	33	6
5/13/14 1:45	AMPHI	LA CIMA MIDDLE SCH	ETDA	32	6
5/14/14 8:30	TVUSD	TANQUE VERDE ELEM SCH	ETDA	25	6
5/14/14 9:35	TVUSD	TANQUE VERDE ELEM SCH	ETDA	25	6
5/14/14 10:40	TVUSD	TANQUE VERDE ELEM SCH	ETDA	25	6
5/14/14 11:45	TVUSD	TANQUE VERDE ELEM SCH	ETDA	25	6
5/15/15 12:26	CFSD	ORANGE GROVE MID SCH	ETDA	31	6
5/15/15 13:30	CFSD	ORANGE GROVE MID SCH	ETDA	27	6
5/16/14 9:15	TUSD	ROBERTS/NAYLOR K-8	ETDA	30	6
5/16/14 11:25	TUSD	ROBERTS/NAYLOR K-8	ETDA	30	6
5/16/14 13:20	TUSD	ROBERTS/NAYLOR K-8	ETDA	30	6

5/19/14 9:23	AMPHI	WILSON K-8	ETDA	27	6
5/19/14 10:19	AMPHI	WILSON K-8	ETDA	34	6
5/19/14 11:15	AMPHI	WILSON K-8	ETDA	29	6
5/19/14 12:51	AMPHI	WILSON K-8	ETDA	30	6
5/19/14 13:47	AMPHI	WILSON K-8	ETDA	30	6
5/19/14 14:43	AMPHI	WILSON K-8	ETDA	37	6
5/20/14 7:30	CFSD	ORANGE GROVE MID SCH	ETDA	31	6
5/20/14 8:47	CFSD	ORANGE GROVE MID SCH	ETDA	31	6
5/20/14 11:22	CFSD	ORANGE GROVE MID SCH	ETDA	23	6
5/20/14 12:26	CFSD	ORANGE GROVE MID SCH	ETDA	30	6
5/20/14 13:30	CFSD	ORANGE GROVE MID SCH	ETDA	27	6

EDTA = *El Tour de Agua*

## APPENDIX G

### *Tucson Toolkit* Participating Schools 2013-2014 (Distributed by EExchange)

<b>TUCSON TOOLKIT – PARTICIPATING SCHOOLS 2013-2014</b>				
<b>SCHOOL</b>	<b>DISTRICT</b>	<b># STUDENTS</b>	<b>GRADE</b>	<b>DELIVERY DATE</b>
Valencia Middle School	TUSD	165	6	9/19/13
Valencia Middle School	TUSD	165	6	9/19/13
Civano Community School	VUSD	40	6-8	10/31/13
Roberts/Naylor K-8 School	TUSD	31	6	11/20/12
McCorkle K-8 School	TUSD	31	6	1/14/14
McCorkle K-8 School	TUSD	31	6	1/14/14
McCorkle K-8 School	TUSD	31	6	1/14/14
Maxwell K-8 School	TUSD	26	5	42/26/14
Maxwell K-8 School	TUSD	26	5	42/26/14

## APPENDIX H

### Special Events 2013-2014

Date	Time	Event
10/19/2013	5:00-9:00pm	Discovery Night at Biosphere 2
10/20/2013	10:00am-2:00pm	Envision Tucson Sustainable Festival at Reid Park
11/7 & 8/2013	9:00 am-1:00 pm	Math, Science and Technology Funfest at TCC
11/21/2013	6:00-8:00 pm	Rattlesnake Ridge Elementary School Science Night



# Citizens' Water Advisory Committee

## Financial Plan • 1.7.2015



# The Water Reliability Program



Water Supply

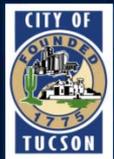
Water Quality

Water  
Customers

Operations  
& Systems

Water Conservation  
& Efficiency

The Water Reliability Program  
includes projects and programs that ensure we have a  
reliable water supply  
and water system – today & in the future



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# Step One in Water Rate Process: the Financial Plan



# Context: Policy Framework

## Mayor & Council Policies

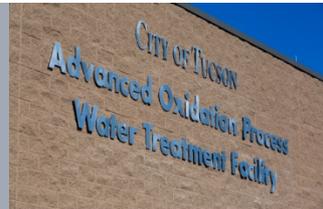
- Debt service coverage
- Cash reserves
- Annual Review of rates and charges

## Bond Covenants/Rating Agencies

- Debt service coverage (Senior Lien)
- Working Capital – Day of O & M

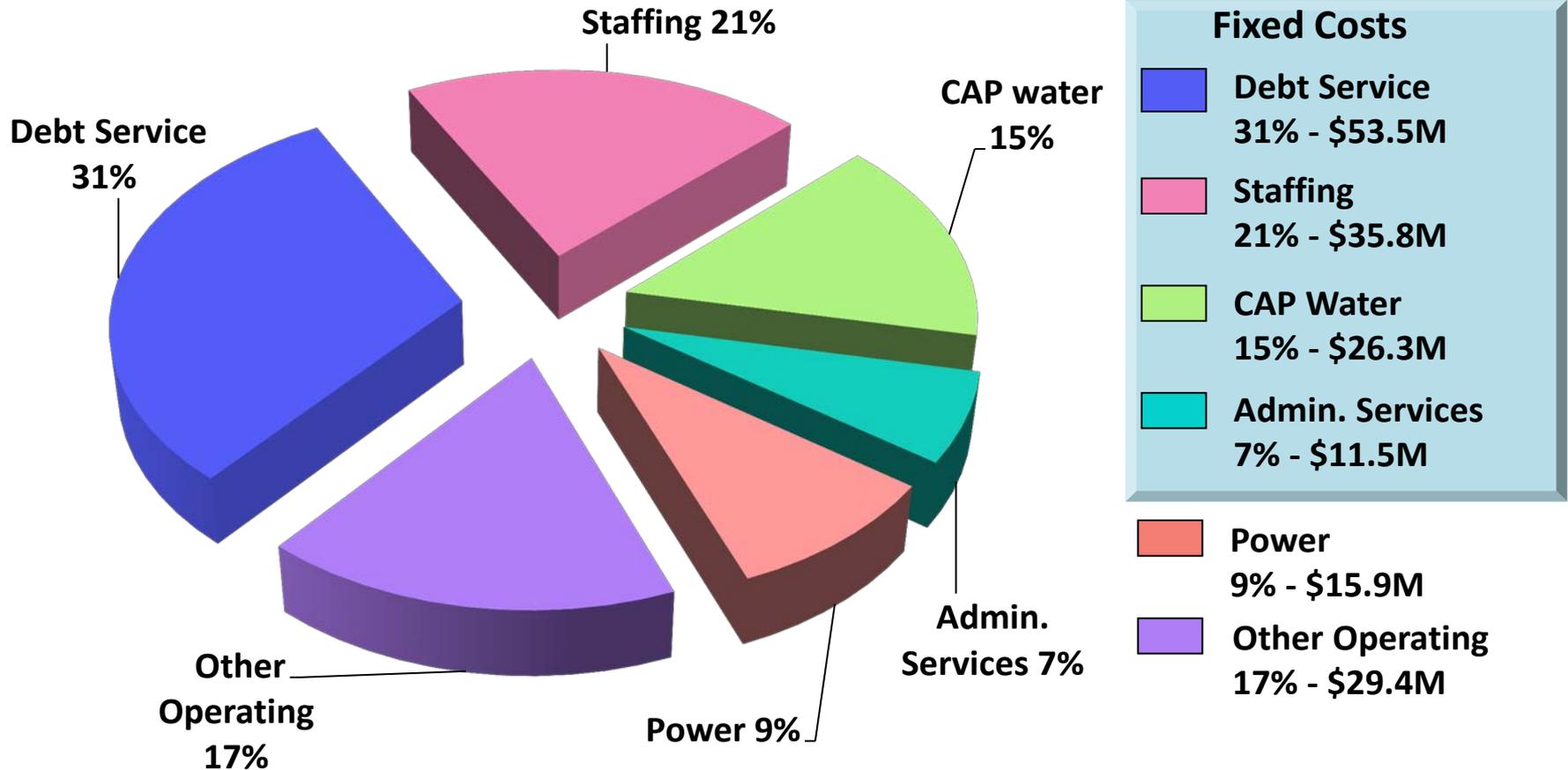


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# Operating & Maintaining FY 2016

## \$172.4 million budget request

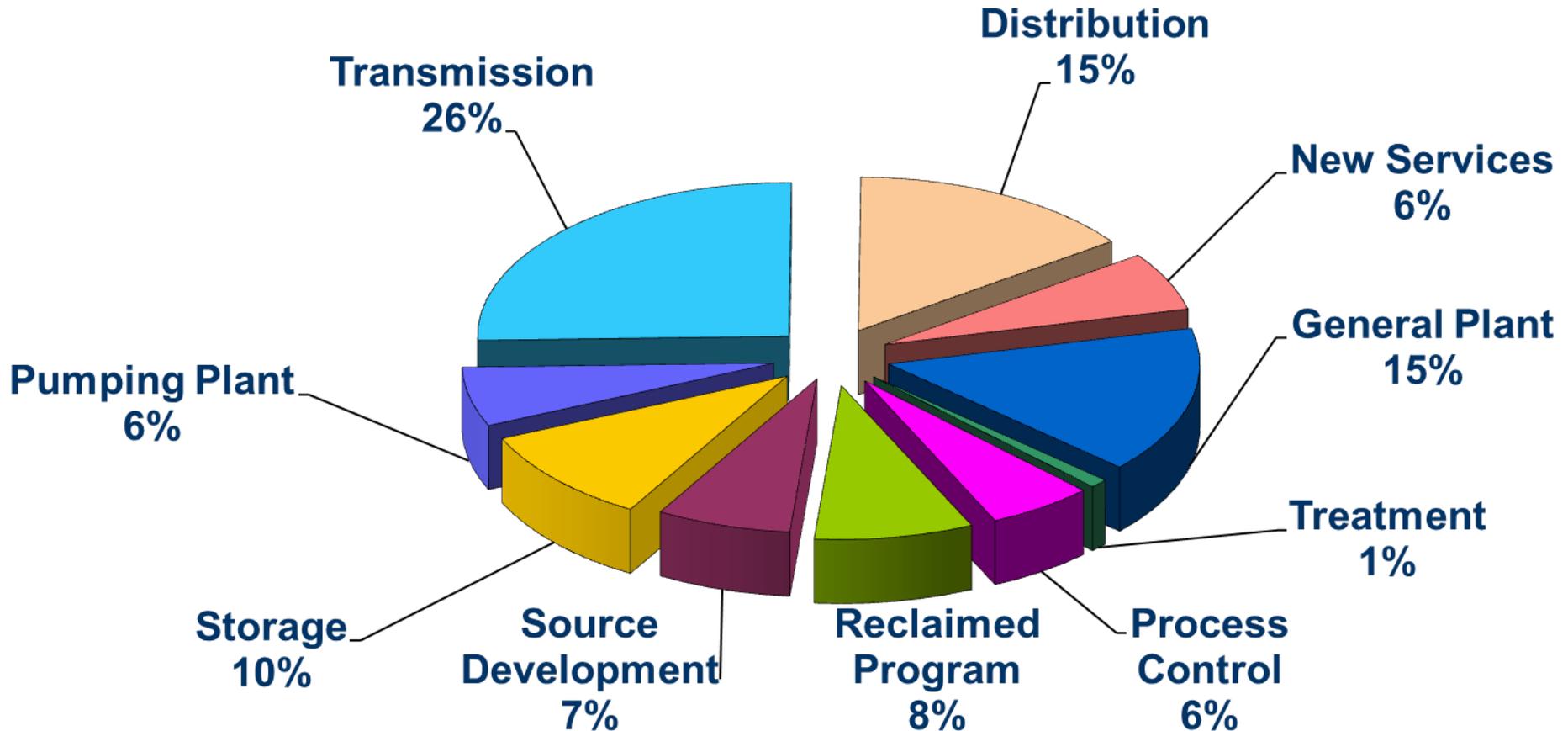


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# Capital Budget FY 2016-FY 2020

\$324.8 million

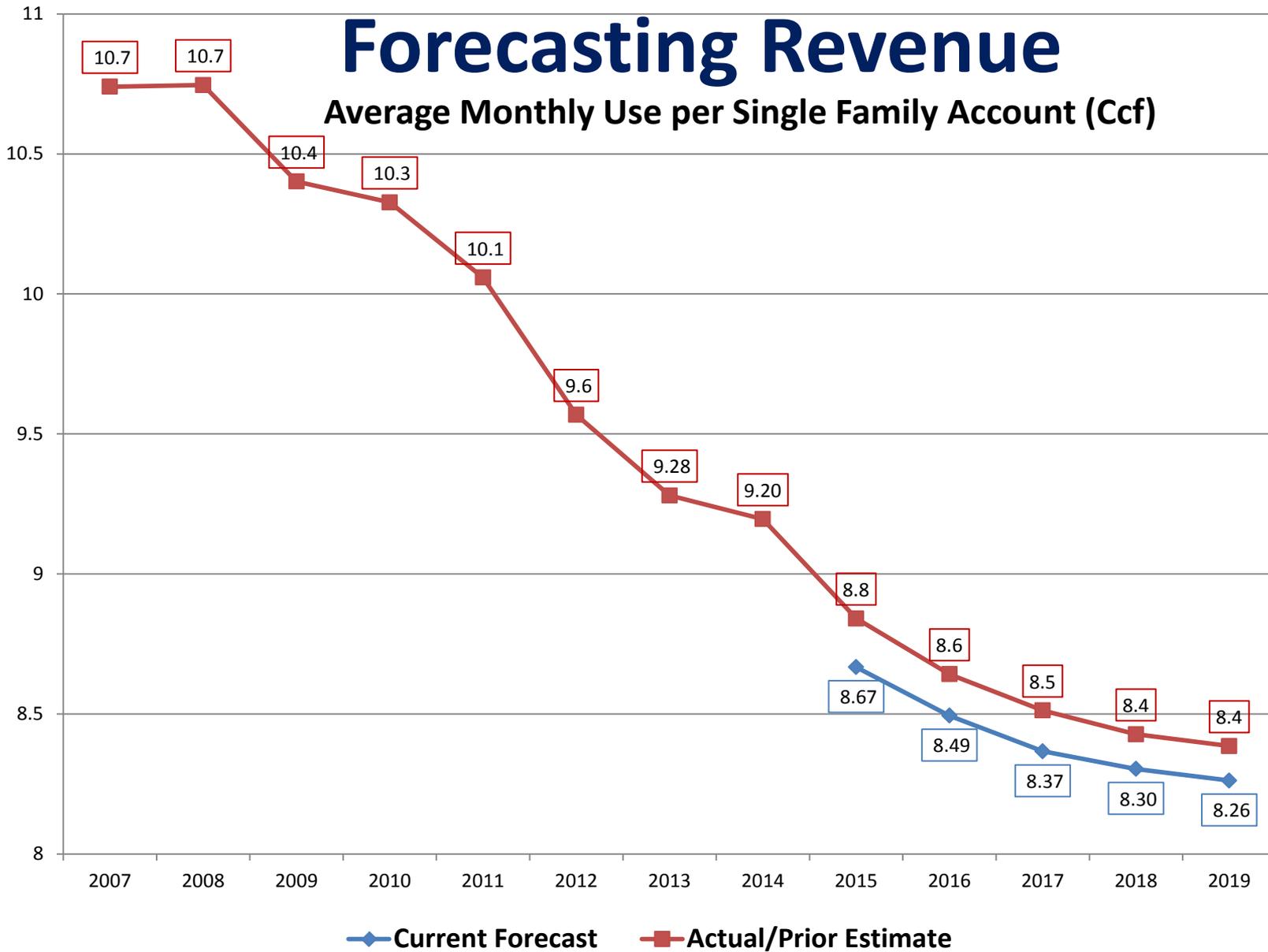


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# Forecasting Revenue

Average Monthly Use per Single Family Account (Ccf)



◆ Current Forecast

■ Actual/Prior Estimate



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# Comparison of Overall Revenue Increases

	Option 1 Alternative Plan	Option 2 Alternative Plan No In-Lieu Tax	Prior Plan
FY 2016	7.3%	7.1%	8.3%
FY 2017	7.3%	7.1%	8.3%
FY 2018	7.3%	7.1%	8.3%
FY 2019	7.3%	7.1%	8.3%
FY 2020	7.3%	7.1%	NA

\* CWAC finance subcommittee recommended



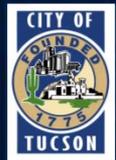
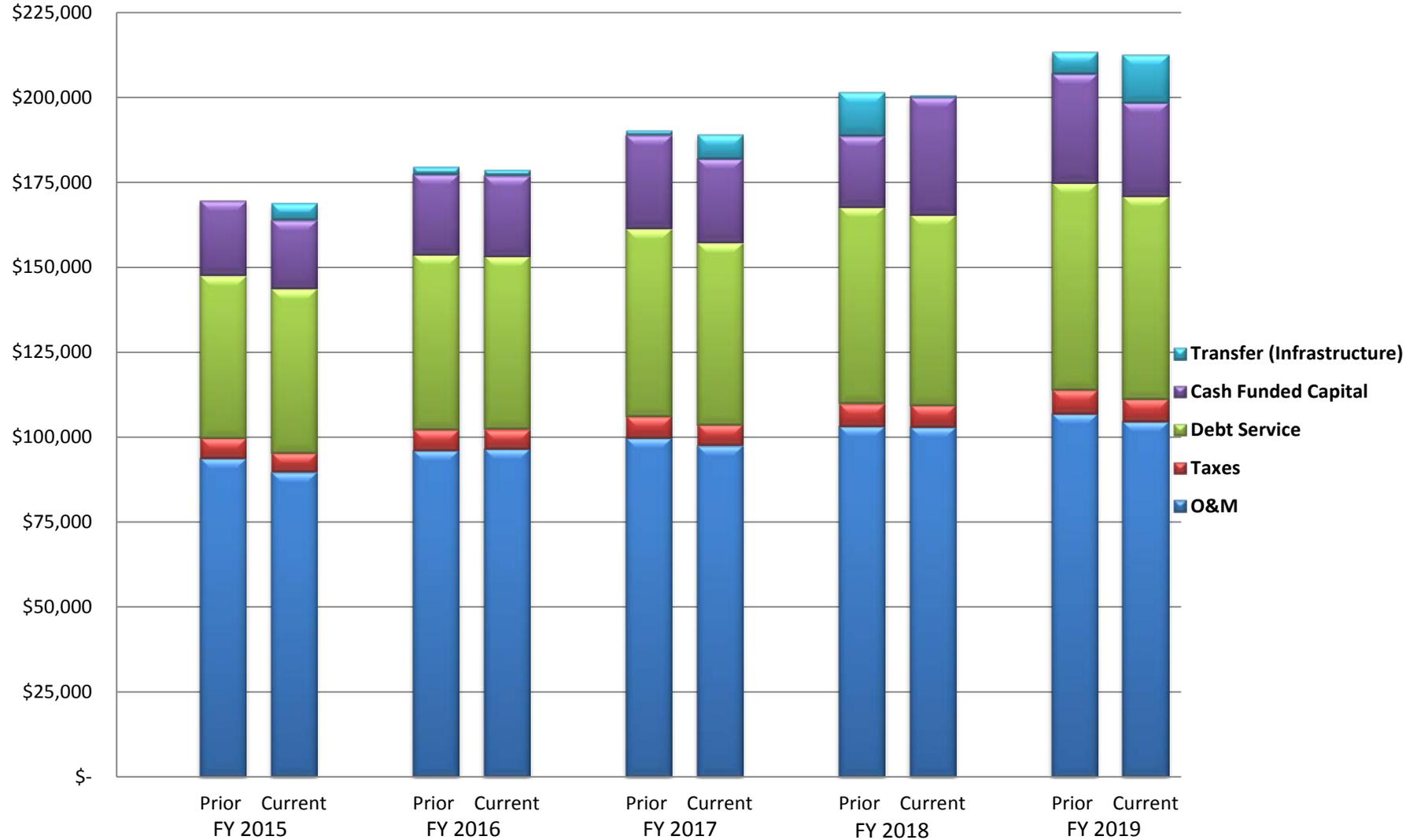
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# Comparison of Annual Revenue Requirements from Rates

## Current Plan vs. Prior Plan

1,000's (\$)



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# FY 2015-2020 Preliminary Financial Plan

## Debt Service Coverage: All Debt

	2015	2016	2017	2018	2019	2020
<b>All Debt<sup>1</sup></b> Option 1	173%	169%	177%	179%	185%	193%
<b>All Debt<sup>1</sup></b> Option 2 CWAC finance subcommittee recommended	173%	168%	176%	177%	183%	191%

<sup>1</sup> M&C Policy = 175%



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# FY 2015-2020 Preliminary Financial Plan

## Debt Service Coverage: Senior Lien Coverage

	2015	2016	2017	2018	2019	2020
<b>Sr. Lien Coverage<sup>2</sup></b>						
Option 1	200%	194%	202%	201%	206%	215%
<b>Sr. Lien Coverage<sup>2</sup></b>						
Option 2						
CWAC finance subcommittee recommended	200%	193%	201%	199%	204%	212%

<sup>2</sup> Bond covenant = 175%



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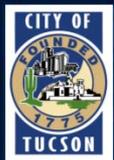


# FY 2015-2020 Preliminary Financial Plan Options

## Working Capital/Cash Reserves

	<u>2015*</u>	<u>2016*</u>	<u>2017*</u>	<u>2018*</u>	<u>2019*</u>	<u>2020*</u>
<b>Working Capital /Cash Reserves</b>						
Option 1	\$35.0M	\$30.9M	\$31.5M	\$31.9M	\$32.7M	\$33.6M
Option 2	\$35.0M	\$30.9M	\$31.0M	\$30.1M	\$32.2M	\$33.2M
<b>Days of Working Capital</b>						
Option 1	121	100	100	99	100	100
Option 2	121	100	100	95	100	100

\*Reflects FY ending June 30



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# Next Steps

- Mid Feb** Staff conducts Cost of Service Study
- Feb 18** Mayor and Council vote to adopt (or not) the FY 2015-2020 Financial Plan
- Feb 19-25** CWAC Finance Subcommittee meets to review Cost of Service/revenue targets & rate schedules
- March 7** CWAC meeting on rate schedules
- Apr 7** Mayor and Council review proposed rate schedules & slate Notice of Intent to increase water rates
- May 19** Mayor and Council public hearing on proposed water rates
- July 6** New water rates would take effect



# Outreach

Late Jan/early Feb Customer Rate Design Group

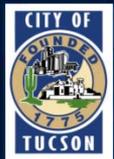
March 8-31 Meet with Council Offices & stakeholders on rate schedules

Apr 7-May 18 Rate Town Halls

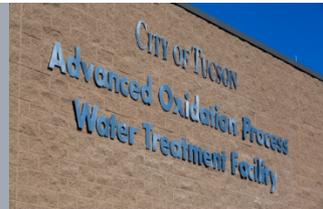
June *Water Matters* bill insert focus on rates



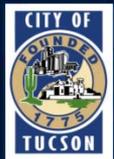
Available online: CWAC reports, proposed rates and fees, and CWAC meeting minutes and PowerPoints



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# Questions or Comments?



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# **TUCSON WATER**

**Proposed FY 2015 - 2020  
Financial Plan**

**CWAC Meeting**

**January 7, 2015**



# Tucson Water Financial Planning Policies and Other Financial Issues Impacting the FY 2015 - 2020 Financial Plan

## Mayor and Council Water System Financial Policies

To assist with the task of operating the Water System, the Mayor and Council have adopted water service policies recommended by CWAC (last updated January 1998). A number of these policies establish guidelines for the water financial planning and ratemaking process and include the following:

- Annual debt service coverage of at least **1.75** shall be maintained on all outstanding debt.
- The Utility shall maintain cash reserves adequate for known future obligations plus an allowance for unbudgeted contingencies set at five percent (**5%**) of revenues from water sales.
- Water rates and charges shall be reviewed annually and changes in the rate structure shall be implemented so as to avoid sudden and large-scale shifts in water rates.

## Tucson Water Revenue Bond Covenants

Tucson Water's bond covenants require that annual debt coverage of at least **175%** be maintained; however, the bond ordinances require 175% coverage *only as applied to Senior Lien debt* (Water Revenue Bond debt and Water System Revenue Obligations) and not to Tucson Water's Junior Lien debt (Water Finance Infrastructure Authority [WIFA] loans).

If in any year actual Senior Lien coverage does not meet the 175% level; bond covenants would require Tucson Water to make large cash deposits in a restricted account. The amount of the deposit would be in the range of \$15-\$25 million. Covenants also specify circumstances under which deposited monies may be released. Surety bonds are no longer readily available in the current financial markets.

## Policies in Recently Adopted Financial Plans

Recent financial plans adopted by Mayor and Council have targeted a cash reserve level of about **\$24-\$30 million**, or about **14% - 15%** of annual water sales revenues. The Financial Plan adopted in 2014 maintained this reserve level in all years of the Plan. In the FY 2015 through FY 2020 Plan (the 2015 Plan), cash reserves are also projected to exceed the official 5% policy, in order to be more consistent with other utilities. Specifically, the 2015 Plan is projected to maintain reserve levels of about 15% - 17% of water sales. An additional metric

is the number of days of working capital/cash reserves which is a criterion utilized by the bond rating agencies to evaluate the financial stability of the Utility. Compared to other Utilities in our rating category (high grade) Tucson Water continues to maintain a relatively modest number of days of working capital/cash reserves. Other Utilities in the same category have anywhere from 120-570 days of working capital/cash reserves. The proposed 2015 Plan reflects 95-100 days of working capital/operating reserves in all years of the Plan which represents a moderate improvement over the Prior Plan.

The 2014 Plan adopted by Mayor and Council did not meet the debt service coverage policy on all debt until the final year of the Plan (2019); however, the 175% coverage required by the bond ordinance for senior lien debt was met. The 2015 Plan exceeds the 175% coverage on senior lien debt in all years of the Plan and meets the 175% coverage on all debt in the last four years of the Plan (FY 2017-FY2020). In addition, input from the bond rating agencies indicates that a minimum 185% coverage on senior lien debt is desirable to obtain favorable interest rates on debt and this target is met in all years of the Plan.

### Other Policies in the Proposed Financial Plan

The proposed 2015 Plan includes the following policies:

- Debt Financing for new Tucson Water System Revenue Obligations:
  - Term – 20 years
  - Interest rates – 4.0% to 5.4%
  - Interest rates-Payments – Principal and Interest payments in all years
  
- Calculation of Debt Service Coverage:
  - *Include in revenues available for debt service:*
    - Santa Rita Bel Air fees, Diamond Bell fees, CAP Water Resource fees
    - Developer cash contributions on capital projects

### On-going Issues - FY 2015

- *Financing the CIP: Tucson Water will continue to finance part of its capital program with debt financing; a combination of WIFA loans (through FY 2015) and water system revenue obligations until a decision is made to utilize another form of financing. The proposed 2015 Plan increases the level of cash funding for the CIP to 53%, from 48% in the Prior Plan.*
  
- *Tucson Water continues to manage vacancies and is actively filling critical positions impacting maintenance and customer service.*

## Issues for - FY 2015 and Beyond

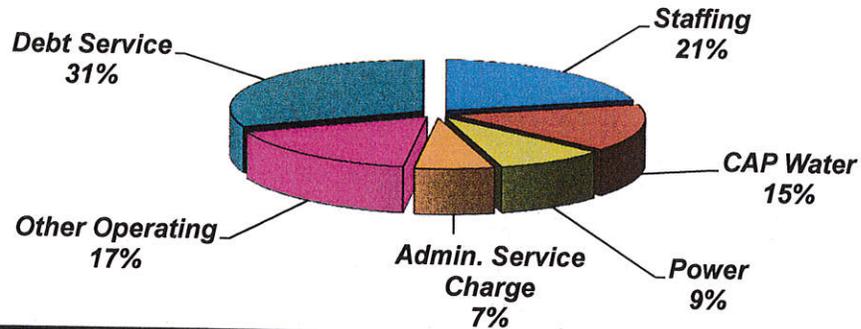
- *The In-Lieu-of Property Tax included in prior Plans is included only in the current year of the Plan (FY 2015). The CWAC Finance Sub-Committee recommended FY 2015-2020 Financial Plan does not include the in-Lieu-of-Property-Tax beyond FY 2015. The Mayor and Council will make the final determination regarding the In-lieu-of-Property Tax.*

*Low Income Assistance Program. Tucson Water continues to include funding for a Low Income Assistance Program. The current program provides a 50% monthly bill credit to qualifying customers.*

- *Designated for Infrastructure. As in prior plans, the 2015 Plan reflects a portion of cash reserves as designated for infrastructure to identify cash that funds the Capital Program. This mechanism clearly identifies capital program funding and helps to smooth overall revenue increases required in the Plan.*
- *Water Sales/Consumption. Water Sales revenue under existing rates is forecasted to be slightly higher in each year of the 2015 Plan, compared to the prior Plan. The water sales consumption forecast continues to reflect the downward trend in average annual use per service consistent with the prior Plan. Customer account growth and nonpotable water use are increased slightly in all years of the Plan compared to the prior Plan, reflecting more current data.*

**FY 2016 O & M Budget Request  
\$172.4 Million**

Revised 12/22/2014



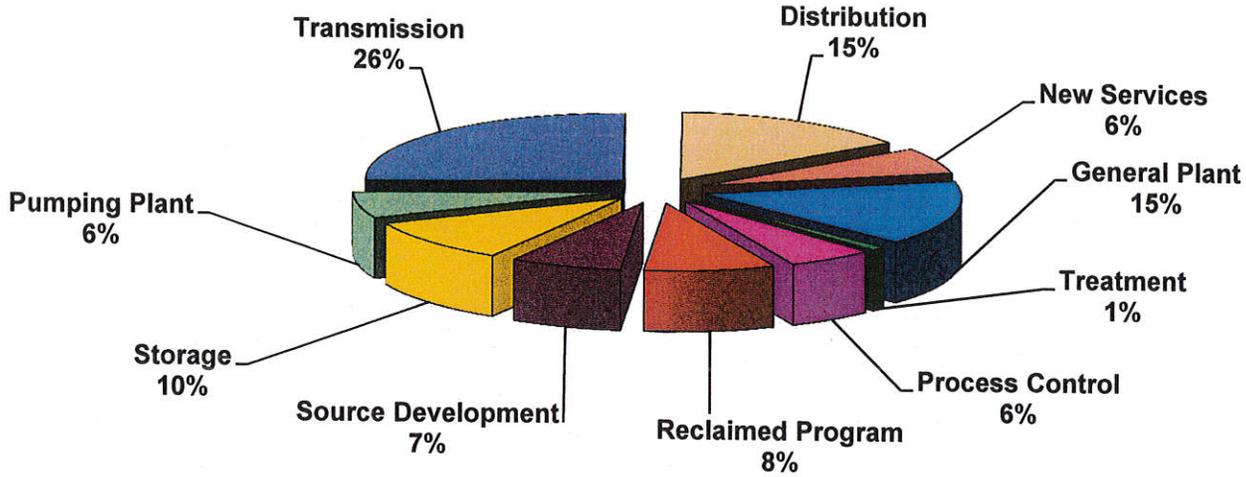
**FY 2016 Operating Budget Request**

	FY 2015 Adopted Budget	FY 2016 Requested Budget	Change
Requested O&M Budget	\$163,556,140	\$172,357,736	\$8,801,596
Less Debt Service	50,827,560	53,511,000	\$2,683,440
Less Salaries/Wages	35,531,890	35,825,691	293,801
Remaining O&M	\$77,196,690	\$83,021,045	\$5,824,355

**Comparison of Major O & M Elements**

	FY 2015 Adopted	FY 2016 Request	Change From FY 2015 Adopted
CAP Water -Commodity	\$21,455,500	\$22,999,630	\$1,544,130
CAP Water - Capital	3,028,010	3,316,390	288,380
Power (Electricity/Gas )	15,164,480	15,913,825	749,345
Admin. Service Charge (indirect)	7,362,540	7,583,416	220,876
Admin. Service Charge (direct)	2,387,690	2,322,112	(65,578)
In-Lieu-of Property Tax	1,600,000	1,600,000	0
Legal	400,000	600,000	200,000
Bank Services	953,000	975,000	22,000
Test Services	270,160	274,820	4,660
Liability Insurance	1,167,600	1,167,600	0
Cell Phones,Telephone,Aircards & GPS	525,400	615,430	90,030
Community Relations	162,000	161,500	(500)
Public Outreach and Advertising	178,660	303,660	125,000
O&M Maint. (Services and Commodities)	8,458,550	8,995,560	537,010
Postage	1,352,870	1,550,920	198,050
Fuel	1,314,540	1,131,900	(182,640)
Furniture, Equip & Computers < \$5000	707,000	770,865	63,865
Conservation Fund	3,050,000	3,540,250	490,250
Capital Equipment > \$5,000	1,778,650	1,831,000	52,350
Software Maintenance & Purchases	1,175,420	1,312,140	136,720
Chemicals	1,193,510	1,197,510	4,000
Travel & Training	291,830	408,425	116,595
Other	3,219,280	4,449,092	1,229,812
<b>TOTAL</b>	<b>\$77,196,690</b>	<b>\$83,021,045</b>	<b>\$5,824,355</b>

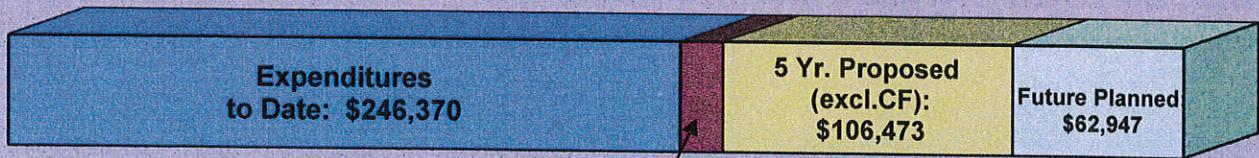
**Capital Budget FY 2016-2020**  
\$324.8 million



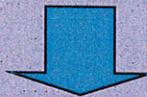
**Major CIP Projects in FY2016 - FY2020**  
(\$000's)

	Total Project Budget	5-Year Budget	Complete
Advanced Metering Infrastructure	\$4,531	\$4,236	2021
Avra Valley Program	\$128,054	\$81,064	2022
Control System Improvements, W782, W783	\$18,137	\$16,446	2020
Meter Replacement, W435, W716	Annual	\$33,036	Annual
Neighborhood Main Replacements (19 projects)	Annual	\$12,485	Annual
Reclaimed Plant Filtration System Modification, W774, W049	\$9,033	\$8,362	2016
Reservoir and Tank Rehab Program	Annual	\$33,960	Annual
Road Improvement Main Replacements, W111	Annual	\$22,926	Annual
Sahuarita Supply Slip Liner, W796	\$7,410	\$7,264	2016
Santa Cruz Wellfield, W759, W857, W039, W089	\$7,582	\$4,907	2016
<b>Total</b>		<b>\$224,686</b>	

**Renewable Potable Water Supply Project Status (\$000's)**



FY15 Budget:  
\$15,692



**Renewable Potable Water Supply Projects in Proposed 5 Year CIP (\$000's)**

Project	5 Year Total	Project	5 Year Total
Avra Valley Program	81,064	SAVSARP Recovery Well Drilling	2,643
Clearwell Reservoir Rehabilitation	12,759	SAVSARP Collector Lines	612
Sahuarita Supply Slipliner	5,614	SAVSARP Recovered Cathodic Protection	339
CAVSARP Well Equipping	3,442		
		<b>Total (excluding carry forward):</b>	<b>\$ 106,473</b>

**TUCSON WATER  
FINANCIAL PLAN  
FY2015-FY2020  
Alternative Plan  
(\$1,000)**

LINE #	Fiscal Years Ending June 30:					
	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
1	<b>Projected Beginning Operating Working Capital</b>					
2	\$30,042	\$35,019	\$30,921	\$31,507	\$31,961	\$32,658
2a	\$15,091	\$15,091	\$1,693	\$4,216	\$4,216	\$9,763
	\$9,026					
	<b>PROJECTED REVENUES:</b>					
3	\$168,958	\$166,505	\$164,920	\$164,122	\$163,835	\$163,601
4	Water Sales Increases from Rate Adjustments:					
		<b>FY 2016</b>	<b>7.30%</b>			
		<b>FY 2017</b>	<b>7.30%</b>	\$12,155	\$12,039	\$11,981
		<b>FY 2018</b>	<b>7.30%</b>	\$12,215	\$12,156	\$12,135
		<b>FY 2019</b>	<b>7.30%</b>		\$12,333	\$12,312
		<b>FY 2020</b>	<b>7.30%</b>		\$12,492	\$12,474
						\$12,656
	<b>Total from Rate Adjustments</b>			\$12,155	\$24,254	\$36,470
5	\$168,958	\$178,660	\$189,174	\$200,592	\$212,733	\$225,084
6	\$17,432	\$17,135	\$18,368	\$15,265	\$15,344	\$15,423
6A	\$2,277	\$2,300	\$2,300	\$2,400	\$2,450	\$2,500
6B	\$344	\$350	\$350	\$375	\$375	\$375
7	\$189,012	\$198,445	\$210,192	\$218,632	\$230,902	\$243,383
	<b>PROJECTED REQUIREMENTS:</b>					
8	\$94,041	\$100,808	\$102,876	\$105,176	\$106,949	\$110,430
9	\$4,055	\$4,277	\$4,518	\$4,781	\$5,060	\$5,345
10	\$50,843	\$53,511	\$56,249	\$58,884	\$62,595	\$64,281
11	\$2,970	\$2,464	\$2,556	\$2,536	\$2,359	\$2,491
12	\$1,600	\$1,600	\$1,600	\$1,600	\$1,600	\$1,600
13	\$525	\$550	\$540	\$555	\$571	\$591
14	\$0	\$1,602	\$6,523	\$0	\$13,547	\$7,537
15	\$20,250	\$27,827	\$24,762	\$34,613	\$27,440	\$40,033
16	\$9,750	\$9,906	\$9,983	\$10,031	\$10,083	\$10,108
17	\$184,035	\$202,543	\$209,607	\$218,177	\$230,205	\$242,417
18	\$35,019	\$30,921	\$31,507	\$31,961	\$32,658	\$33,625
19	20.7%	17.3%	16.7%	15.9%	15.4%	14.9%
20	121	100	100	99	100	100
	<b>OTHER SIGNIFICANT DATA/PROJECTIONS:</b>					
21	N/A	7.3%	7.3%	7.3%	7.3%	7.3%
22	173.0%	169.0%	177.0%	179.0%	185.0%	193.0%
22a	200.0%	194.0%	202.0%	201.0%	206.0%	215.0%
23	\$58,219	\$76,705	\$58,894	\$76,786	\$62,771	\$57,144
	<b>Debt Sales:</b>					
24	\$22,723	\$31,631	\$37,357	\$33,268	\$21,199	\$24,429
25	\$3,735	\$0	\$0	\$0	\$0	\$0
26	% of CIP from Current Revenue			53%		

**TUCSON WATER  
FINANCIAL PLAN  
FY2015-FY2020**

**Alternative Plan; No ILT (Recommended Plan)\*  
(\$1,000)**

LINE #		Fiscal Years Ending June 30:					
		FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
1	Projected Beginning Operating Working Capital	\$30,042	\$35,019	\$30,483	\$31,068	\$30,130	\$32,220
2	Beginning Infrastructure Fund	\$15,091	\$15,091	\$3,406	\$6,875	\$8,877	\$13,295
2a	Carryover Bond Proceeds	\$9,026					
	<b>PROJECTED REVENUES:</b>						
3	Water Sales (existing rates)	\$168,958	\$166,505	\$164,920	\$164,122	\$163,835	\$163,601
4	Water Sales Increases from Rate Adjustments:						
	FY 2016		\$11,822	\$11,709	\$11,653	\$11,632	\$11,616
	FY 2017			\$11,876	\$11,818	\$11,797	\$11,781
	FY 2018				\$11,986	\$11,965	\$11,948
	FY 2019					\$12,135	\$12,118
	FY 2020						\$12,290
	<b>Total from Rate Adjustments</b>		\$11,822	\$23,585	\$35,457	\$47,530	\$59,751
5	Water Sales (including Rate Adjustments)	\$168,958	\$178,327	\$188,505	\$199,579	\$211,365	\$223,352
6	Other Water Revenues/Sources	\$17,432	\$17,135	\$18,368	\$15,264	\$15,343	\$15,421
6A	System Equity Fee	\$2,277	\$2,300	\$2,300	\$2,400	\$2,450	\$2,500
6B	CAP Water Resource Fee	\$344	\$350	\$350	\$375	\$375	\$375
7	<b>Total Revenues/Sources</b>	<b>\$189,012</b>	<b>\$198,112</b>	<b>\$209,523</b>	<b>\$217,618</b>	<b>\$229,533</b>	<b>\$241,648</b>
	<b>PROJECTED REQUIREMENTS:</b>						
8	O & M Expense	\$94,041	\$100,808	\$102,876	\$105,176	\$106,949	\$110,430
9	Utility Tax Embedded in Water Sales Reven	\$4,055	\$4,269	\$4,502	\$4,757	\$5,029	\$5,305
10	Debt Service	\$50,843	\$53,511	\$56,249	\$58,884	\$62,595	\$64,281
11	Other Requirements	\$2,970	\$2,464	\$2,556	\$2,536	\$2,359	\$2,491
12	In Lieu of Tax	\$1,600	\$0	\$0	\$0	\$0	\$0
13	Low Income Program	\$525	\$550	\$540	\$555	\$571	\$591
14	Transfer to Infrastructure Fund	\$0	\$3,315	\$7,469	\$2,003	\$12,418	\$7,443
15	Capital from Water Revenues	\$20,250	\$27,827	\$24,762	\$34,613	\$27,440	\$40,033
16	Administrative Service Charge(direct/indirec	\$9,750	\$9,906	\$9,983	\$10,031	\$10,083	\$10,108
17	<b>Total Requirements</b>	<b>\$184,035</b>	<b>\$202,648</b>	<b>\$208,938</b>	<b>\$218,556</b>	<b>\$227,443</b>	<b>\$240,682</b>
18	Projected Ending Operating Working Capital/Reserve	\$35,019	\$30,483	\$31,068	\$30,130	\$32,220	\$33,186
19	Estimated Reserves As % of Sales Rev	20.7%	17.1%	16.5%	15.1%	15.2%	14.9%
20	Estimated Reserves as Days of O&M	121	100	100	95	100	100
	<b>OTHER SIGNIFICANT DATA/PROJECTIONS:</b>						
21	% Increases: Water Sales Rates/Revenue	N/A	7.1%	7.1%	7.1%	7.1%	7.1%
22	Debt Service Coverage (All Debt)	173.0%	168.0%	176.0%	177.0%	183.0%	191.0%
22a	Coverage: Senior Lien Debt	200.0%	193.0%	201.0%	199.0%	204.0%	212.0%
23	Capital Improvement Program (CIP)	\$58,219	\$76,705	\$58,894	\$76,786	\$62,771	\$57,144
	Debt Sales:						
24	Water System Revenue Obligations/Bond	\$22,723	\$31,631	\$37,357	\$33,268	\$21,199	\$24,429
25	WIFA Loan	\$3,735	\$0	\$0	\$0	\$0	\$0
26	<b>% of CIP from Current Revenue</b>				<b>53%</b>		

\*Corrected Administrative Service Charge

# TUCSON WATER

## CONSERVATION PROGRAM Preliminary FY 2015 - FY 2020 CCTF

Includes FY 2016 rate increase recommended by the CWAC Conservation and Education Sub-Committee

Revised 01/05/2015

			2015	2016	2017	2018	2019	2020
<b>PROJECTED CONSUMPTION*</b>								
<b>Potable Water Consumption Projection (Ccf)</b>			39,018,442	38,307,264	37,812,014	37,527,754	37,396,899	37,283,713
<b>REVENUES</b>								
<b>Beginning Balance</b>			\$ 2,363	\$ 2,044	\$ 1,211	\$ 713	\$ 540	\$ 193
	<b>Inc</b>	<b>Rate</b>						
Water Sales (7/05/15 Rates)		0.07	\$ 2,731	\$ 2,707	\$ 2,659	\$ 2,611	\$ 2,563	\$ 2,562
Water Sales Increases from Rate Adjustments:								
<i>FY 2016 Rate Adjustment</i>	0.01	0.08			\$ 383	\$ 378	\$ 375	\$ 374
<i>FY 2017 Rate Adjustment</i>	0.00	0.08			\$ -	\$ -	\$ -	\$ -
<i>FY 2018 Rate Adjustment</i>	0.01	0.09			\$ 378	\$ 378	\$ 375	\$ 374
<i>FY 2019 Rate Adjustment</i>	0.00	0.09				\$ -	\$ -	\$ -
<i>FY 2020 Rate Adjustment</i>	0.01	0.10					\$ 374	\$ 374
Total from Rate Adjustments			\$ -	\$ -	\$ 383	\$ 756	\$ 750	\$ 1,122
<b>Water Sales (including Rate Adjustments)</b>			<b>\$ 2,731</b>	<b>\$ 2,707</b>	<b>\$ 3,042</b>	<b>\$ 3,367</b>	<b>\$ 3,313</b>	<b>\$ 3,684</b>
<b>Total Revenues Available</b>			<b>\$ 5,094</b>	<b>\$ 4,751</b>	<b>\$ 4,253</b>	<b>\$ 4,080</b>	<b>\$ 3,853</b>	<b>\$ 3,877</b>
<b>PROJECTED REQUIREMENTS</b>								
<b>Total Conservation Requirements</b>			<b>\$3,050</b>	<b>\$3,540</b>	<b>\$3,540</b>	<b>\$3,540</b>	<b>\$3,660</b>	<b>\$3,785</b>
<b>Projected Surplus/(Deficit)</b>			<b>\$ 2,044</b>	<b>\$ 1,211</b>	<b>\$ 713</b>	<b>\$ 540</b>	<b>\$ 193</b>	<b>\$ 92</b>

\* Ties to Potable Consumption Forecast