

Tucson Environmental Water Banking through Conservation Program

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The Tucson Environmental Water Banking through Conservation Program (Tucson Environmental Water Banking Program) seeks to implement an innovative conservation mechanism known as "Conserve to Enhance," recently proposed by the University of Arizona's Water Resources Research Center (Schwarz and Megdal, 2007; Schwarz and Megdal, 2008; Megdal *et al.*, 2009). Conserve to Enhance stipulates that individuals who are motivated to conserve water for environmental purposes could implement on-site water conservation measures and dedicate the cost savings of their reduced water use to local environmental enhancement projects such as riparian restoration efforts. The Tucson Environmental Water Banking Program is a pilot program building on the Conserve to Enhance idea and will provide a direct link between water conserved at a particular home or business and on-the-ground restoration at a local site in the Santa Cruz River Basin. The long-term goal is to scale up the reach of the project to generate sufficient funds to purchase and transport water or treated effluent to riparian protection and restoration efforts in the basin.



Aim of this pilot program is to: 1) establish a voluntary environmental water bank which will connect dollars saved through water conservation at homes and businesses towards purchasing water for riparian protection and/or restoration activities, 2) utilize modern water harvesting techniques to create a new source of water to save precious potable water supplies, 3) subsidize installation of rainwater or graywater harvesting features at local homes, 4) enhance local rivers through restoration and increased water flows, 5) test community participation in this type of program, 6) establish a stakeholder Advisory Board to provide transparency and oversight, and 7) develop the mechanism to replicate this approach for other municipal water works and watersheds where the environment is currently a "non-customer" for access to water.

How the Water Bank Works - The basic Conserve to Enhance program offers water customers the option of donating the money they save through water conservation to a fund that purchases water supplies for environmental enhancement projects. Thus, as individual households make voluntary reductions in their water consumption, these reductions are measured against prior year's usage for the same month. Participants pay for the higher level of usage, and the money saved by conserving water is deposited into the fund. The fund is overseen by the Advisory Board and used to purchase water for environmental enhancement

Anticipated Results: The immediate benefits of a Conserve to Enhance program would be visible in small-scale improvements to a local wash or a portion of the Santa Cruz River. We anticipate the program will lead to a reduction of the urban heat island effect, improved erosion control, revegetation with native plants, creation of wildlife habitat, and the creation of urban greenways. Schwarz and Megdal (2007) estimate that a mature Conserve to Enhance program in Tucson could produce annual revenues ranging from \$100,000-\$1,200,000 per year. The actual amount will depend on the number of participants, the retail cost of water, the amount of conservation realized, and the method used to calculate "conserved water." At the mature scale,

the revenues would be sufficient to purchase water from available sources and deliver it to local restoration projects as selected by the Advisory Board.

In addition to on-the-ground results, implementation of the pilot program will allow us to ground truth the level of community interest in the Conserve to Enhance concept. The University of Arizona's Water Resources Research Center has implemented stakeholder workshops in Tucson and presented the concept to regional and national audiences, citing an overall positive response (Megdal *et al.*, 2009).[1] Attendees of the workshops in Tucson included interested citizens as well as representatives from water utilities, environmental groups, city and county government, and academia. The pilot will focus on engaging and recruiting homeowners that are interested in receiving subsidies towards installing rainwater harvesting systems at their homes, either by hiring professional installers or through Watershed Management Group's Co-op Program. Watershed Management Group has already developed relationships with a sizable number of homeowners who are willing to volunteer their time to improve the Tucson basin through water harvesting installation. The Co-op Program is an ideal launchpad for our pilot because it offers volunteer labor that will help homeowners in the program defray the high upfront costs of installing their own water harvesting systems. Larger-scale water harvesting projects with commercial developments will be pursued, which have the potential for much larger water conservation returns.

What will make this program successful: Based on lessons learned from existing programs that provide water for the environment, the following characteristics are the indicators of successful programs:

- Program is voluntary, simple and easy to explain;
- Support a pre-existing, highly visible riparian restoration project[2];
- Support a project that is noncontroversial and provides benefits to the local community;
- Articulate specific results that are expected from the restoration actions;
- Identify the water quality needs for the project;
- Identify an available water source with the appropriate water quality for restoration;
- Identify a feasible water delivery mechanism;
- Include partnerships between city water authorities, private water utilities, and well-established, local environmental organizations;
- Establish an independent, stakeholder Advisory Board to oversee the fund and provide accountability and credibility;
- Enjoy strong support from city government (through promotion, matching funds, etc.);
- Implement in communities that have a strong environmental ethic and a history of successful water conservation efforts; and
- Promote restoration successes through outreach in the water bill, on websites, and through the media.

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Current Status: The Bureau of Reclamation currently funds a part-time staff person at the Water Resources Research Center to implement one or more pilot programs. Sonoran Institute has secured funding from the US Environmental Protection Agency (USEPA) to provide a one-quarter time staff person to begin implementation of a one-year pilot program in Tucson; USEPA funding will also cover subsidies (\$1,000) for installation of water harvesting features at 30 Tucson residential homes.

Next Steps: With existing funds we can only implement a scaled-back pilot of the Conserve to Enhance program, which does not include the cost for outreach materials or any other subsidies beyond the 30 residential subsidies mentioned above. The Sonoran Institute submitted a proposal to the Royal Bank of Canada in March 2009 to fund staff time for program outreach, evaluation, dissemination of results and additional water harvesting subsidies. Tucson Water submitted a proposal to the U.S. Bureau of Reclamation in response to a Recovery Act of 2009 RFP in May of 2009 to implement a full-scale pilot program in Tucson within a one-year time frame starting in September of 2009.

Currently, the partner organizations are establishing the foundation for this program. We are working to establish an accounting mechanism to track participants' savings through a web-based automatic conservation calculator. We began developing basic program materials for promoting the program within the community. We are also in the process of recruiting candidates for the project's Advisory Board. Currently we are working with local organizations involved in environmental restoration to draft a short list of potential beneficiary sites. We anticipate finalizing the composition of the Advisory Board and commencing installation of water harvesting features in the fall of 2009.

References Cited:

Megdal, Sharon B., Joanna Bate, and Andrew Schwarz. "Securing Water for Environmental Purposes: Establishing Pilot Programs." *The International Journal of Sustainability*, Submitted February 2009.

Schwarz, Andrew, and Sharon B. Megdal. *Water Conservation Banking: Municipal Water Conservation to Support Environmental Enhancement*. Tucson: Water Resources Research Center, University of Arizona, 2007.

Schwarz, Andrew, and Sharon B. Megdal. "Conserve to Enhance--Voluntary Municipal Water Conservation to Support Environmental Restoration." *Journal of the American Water Works Association*, 2008: 42-53.

[1] Some general concerns not previously mentioned include: the upfront cost to homeowners of installing water harvesting systems (this could be mitigated by the Institute's proposed subsidies); hardening of demand; and decrease in demand, which could result in across-the-board rate increases to ensure that operating costs are covered.

[2] Funds will likely be insufficient to create a new restoration project from the ground up—the funds from this program can be leveraged far better when used to support existing organizations that already have ongoing riparian restoration projects (Megdal *et al.*, 2009).