



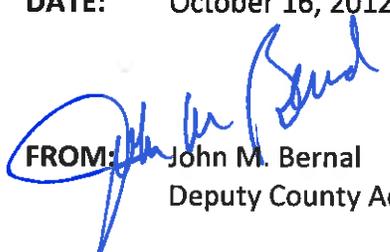
MEMORANDUM

Public Works Administration



DATE: October 16, 2012

TO: C. H. Huckelberry
County Administrator

FROM:  John M. Bernal
Deputy County Administrator

RE: **Water Resources Asset Management Plan**

Attached is an October 5, 2012 memorandum from Kathleen Chavez, Water Policy Manager, to Jackson Jenkins, Director, Regional Wastewater Reclamation Department. This memorandum transmits the recently completed Water Resources Asset Management Plan that involved participation by numerous Pima County Departments over more than one year. The plan describes various potential initiatives for improved management and utilization of our County water resources.

In particular, the introductory portion of this report identifies the 13 action items that are suggested for further development to address ongoing challenges and concerns with the current management of our water resources. The identified next step for the water management committee is to develop a more detailed implementation plan for each of the action items described in the report. This implementation plan would further define the scope of the effort to be undertaken and an estimation of the resources required for advancing such a strategic implementation plan.

I believe this document is a very useful product developed through the skillful guidance of Kathy Chavez, Water Policy Manager, and this Plan deserves our support for continuing effort.

I do note that one of the key action items is developing a comprehensive water rights asset database should be advanced over the course of the next 18 months with the implementation of the Land and Permit Management system that was recently authorized with a contract award to Accela, Inc. by the Board of Supervisors. In addition, certain suggestions for statutory improvements should be developed as promptly as possible to determine whether there are any actions that could still be taken in the upcoming Arizona legislative year.

I look forward to your response to this worthwhile asset management plan.

JMB:jgs

Attachment

Cc: Jackson Jenkins, Director, RWRD
Kathleen M. Chavez, Water Policy Manager



PIMA COUNTY
REGIONAL WASTEWATER RECLAMATION DEPARTMENT
201 NORTH STONE AVENUE
TUCSON, ARIZONA 85701-1207

JACKSON JENKINS
DIRECTOR

PH: (520) 740-6500
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October 5, 2012

TO: Jackson Jenkins, Director - RWRD
FROM: Kathleen M. Chavez, Water Policy Manager

A handwritten signature in blue ink, appearing to read "Kathleen M. Chavez".

SUBJECT: Water Resources Asset Management Plan – Water Rights Policy

As described in the Board of Supervisors Policy F 54.9 relating to Water Rights Acquisition, Protection and Management, transmitted herewith is the *Water Resources Asset Management Plan* (WRAMP) that describes the management and utilization of County water resources. The plan was developed by the Water Management Committee with input from the Water Rights Team.

Key actions recommended in the plan include:

- A comprehensive water rights assets database is needed to document and monitor the use of Pima County water resources assets including surface water rights, groundwater rights, groundwater wells, reclaimed water and long-term storage credits.
- Unused water rights may have strategic value or future value that should be considered before they are disbursed.
- Pima County should participate fully in the Gila River General Adjudication and be prepared to defend its water rights.
- The Water Management Committee and Water Rights Team should remain active in identifying water management needs and opportunities that advance the policies and goals set by the County administrator and the Board of Supervisors.
- The Water Management Committee should develop a strategy and reclaimed water management plan for the use of the County's share of reclaimed water that addresses needs for sustainable flows in the Santa Cruz River, replacement of groundwater use with reclaimed water at County facilities, enhancement of riparian areas and replenishment of the aquifer.

Pending approval to proceed, the next step would be for the Water Management Committee to produce a strategic plan to implement each of the recommended action items described in this report. The hard work and commitment of the Water Management Committee and Water Rights Team invested in preparing the WRAMP was much appreciated. Should you have any questions, I am available at your convenience.

Attachments

c: Suzanne Shields, RFCD Director
Rafael Payan, NRPR Director
Reid Spaulding, Facilities Management Director
Priscilla Cornelio, Transportation Director
Chris Bartos, Stadium District Director
Linda Mayro, Office of Sustainability and Conservation Director
Ursula Kramer, Environmental Quality Director
Christina Biggs, Manager Real Property Division
Water Management Committee
Water Rights Team



Water Resources Asset Management Plan **WRAMP**



October 2012

ACKNOWLEDGEMENTS

SPECIAL ACKNOWLEDGEMENT AND APPRECIATION TO THE STAFF LISTED BELOW FOR THEIR CONTRIBUTIONS TO THE SUCCESSFUL COMPLETION OF THE WATER RESOURCES ASSET MANAGEMENT PLAN

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WATER RESOURCES ASSET MANAGEMENT PLAN

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WATER RESOURCES ASSET MANAGEMENT PLAN

INTRODUCTION and PURPOSE

Water is life and in the arid Southwest, this is especially important. Effective water management requires tracking the inflow, outflow, quantity and quality of groundwater, surface water and reclaimed water.

Although the governmental authority of Pima County (County) is not as a water provider, in its ordinary course of business the County has acquired and regularly acquires land along with associated water rights. The County and its departments use surface water and groundwater, operate wells and generate reusable reclaimed water. These water assets become public property of and are managed by the County. For purposes of this document, Pima County and County refer to the governing body.

Pima County's Regional Flood Control District (RFCD) also acquires land and water rights. RFCD is a special taxing district; a separate and legally distinct entity within the County. Statutory authority allows it to build and operate groundwater replenishment projects that enhance wildlife, recreation and riparian habitats along watercourses and floodplains.¹

Water Management Committee

Effective management of Pima County's water resources assets should be guided by policies and procedures consistent with the Board of Supervisors Policy F 54.9 Water Rights Acquisition, Protection and Management.

"...it is policy of Pima County to buy, sell, lease, exchange, use, improve, operate, manage and maintain County owned and acquired ground and surface water, wastewater, reclaimed water, stormwater, recovered water and associated rights, and credits that inure to the benefit of the citizens of Pima County. The County proposes to manage, operate and maintain those resources, rights and credits in conjunction with other County facilities. These assets will be accurately monitored by creating and maintaining an inventory and management database of all County water and wastewater assets including effluent recharge credits and other County or Pima County Regional Flood Control District owned or acquired water resources."

The Water Rights policy called for establishment of a Water Management Committee (WMC), consisting of staff from applicable County departments. The committee's mission is to develop a Water Resources Asset Management Plan (WRAMP) that will provide guidance and a framework for managing water assets and water resources for the County, including RFCD, and to recommend assignments of various water resource management functions to specific County organizational units including:

- ownership
- lease and purchase of water rights
- availability and use of reclaimed water
- accrual and use of storage credits

Water Resources Asset Management Plan

The Water Resources Asset Management Plan (WRAMP) will advance the structured management of the County's water resource assets. The WRAMP is designed to provide direction based on policies set by the Board of Supervisors as to the manner in which water resources will be procured, managed, maintained, shared, delivered, apportioned, sold or exchanged to provide the maximum benefit to Pima County residents. In addition, the Water Management Committee will advise and assist in the implementation of WRAMP and the procedures established pursuant to the Board's policy.

The County and RFCD own and use many different types of water rights. These include Surface Water Rights, Irrigation Grandfathered Rights, Non-irrigation Grandfathered Rights, various rights to store and withdraw groundwater, as well as reclaimed water, long-term storage credits and stormwater.

Policies and procedures exist for the management of other county assets and to the extent they are applicable, existing policies apply to water resource assets as well. Because water resource assets are unique from a real property and personal property perspective, additional policies specific to water resources may be needed.

WRAMP encourages better maintenance and management of water assets, including rainwater harvesting and stormwater use, and works to integrate facilities management, land management, wastewater reclamation and water rights, where practicable, with multi-purpose goals such as recharge, riparian restoration, habitat protection, wildlife viewing, use of interpretive trails, environmental education and research, recreation and other public benefits.

The objective of the Water Resources Asset Management Plan is to maximize the County's and RFCD's water resources asset value, including Surface Water Rights, Groundwater Rights and the production and use of reclaimed water to sustain and protect the natural environment.

Arizona Department of Water Resources – Management Plans

More than halfway into the 45-year period for meeting the goals of the Arizona Groundwater Management Act (GMA), the Arizona Department of Water Resources (ADWR) will develop the fourth of five management plans for each of the Active Management Areas (AMAs), as mandated by the Act.

To assist in achieving the AMA management goals, each management plan covering a ten-year period would be prepared starting in 1980. These plans contain progressively more rigorous management requirements for agricultural, municipal and industrial water users with the goal of achieving safe yield by 2025. Safe yield is accomplished when no more groundwater is being withdrawn than is annually replaced. ADWR is starting the process for the Fourth Management Plan for 2010 through 2019. Reclaimed water use is one of several strategies for meeting the safe yield goal.

1. <http://rfcd.pima.gov/district/funding.htm>

Comprehensive Plan – Water Resources Element

In December 2001, the Board of Supervisors adopted the Pima County Comprehensive Plan update that included Regional Plan Policies² for seven elements including a water resources element. The Water Resources Element Policies included:

- *limiting pumping near shallow groundwater*
- *maximizing use of Central Arizona Project (CAP) water and reclaimed water*
- *limiting human water use in certain areas*
- *using CAP water in riparian areas*
- *using reclaimed water for riparian restoration*
- *reducing per capita consumption*
- *limiting turf water use*

In June 2007, the Board of Supervisors strengthened the Resource Element of the Comprehensive Plan Regional Policies through adoption of Resolution 2008-72.³ The intent was:

- *to provide pertinent information in a timely fashion to land-use decision-makers about the impacts and sustainability of water resources development*
- *to promote the efficient utilization of existing infrastructures and the prudent construction of additional infrastructure needed for a safe, reliable and renewable water supply*
- *to increase reliance upon renewable water supplies*
- *to minimize impacts of water supply development on groundwater dependent ecosystems, including springs, perennial and intermittent streams and shallow groundwater areas*

Sustainable Action Plan

In May 2007, the Board adopted the Sustainable Action Plan for County Operations. The Sustainable Action Plan includes a number of guiding principles regarding County buildings, landscaping and parks, employee and contractor education, tracking and monitoring, and protection and perpetuation of natural resources. Board Resolution 2007-84⁴ called for:

- *maximizing County water resource assets including Groundwater Rights, Surface Water Rights and production and use of reclaimed water to sustain and protect the County's natural environment*
- *reducing water consumption by 15 percent in all County facilities by 2025*
- *doubling the number of County parks served by reclaimed water by 2013 (subject to voter approval of bond funds to extend reclaimed water lines)*

A key concept for water sustainability includes assurances that the water demands do not outstrip water supplies that support the current and projected population of users, including the environment. New water users and uses may develop and future generations may redefine “sustainable water future” in response to emerging conditions. In order to achieve water sustainability goals, planning must include frequent monitoring of demand, supply and the viability of ecological systems to adjust for changing environmental, social, climate and economic conditions.

Sustainability also implies a regional purview. Water supplies in the Tucson area extend across several jurisdictions to form interdependencies. The region is moving away from groundwater

dependency and increasing its reliance on imported CAP water as well as reclaimed water.

WISP Action Plan

Phase 2 of the City/County Water/Wastewater Infrastructure, Supply & Planning Study (WISP) examined water sustainability.⁵ In the study, a sustainable water future was envisioned to include:

- *water for people and for the environment, now and in the future*
- *learning from the desert and making ourselves drought resistant and drought tolerant*
- *all water supplies coming from renewable sources, to the extent possible*

In November 2010, the Board of Supervisors and City of Tucson Mayor & Council adopted the Action Plan for Water Sustainability to implement goals and recommendations described in the Phase 2 study report. These include the goal to maximize and make efficient use of effluent and other locally renewable water supplies.

Pima County Multi-Species Conservation Plan

Pima County and the Regional Flood Control District have applied for an incidental take permit under Section 10(a) of the Endangered Species Act. The Multi-Species Conservation Plan (MSCP), submitted to U. S. Fish and Wildlife Service on December 2010, identifies that water rights associated with County mitigation lands will be committed to the conservation of species as mitigation under this permit. Specific commitments of water will be identified in “reciprocal” conservation easement exchanged between County and District for County-controlled Mitigation Lands (Appendix G of the MSCP), to limit uses of water and prohibit severing water rights from the mitigation lands. Similar restrictions apply for conservation easements granted to Pima County on private lands acquired for open space (Appendix H of the MSCP).

Harvested Water

The collection, storage and recovery of harvested rainwater is an important resource. Runoff from smaller sites, such as rooftops and streets and onsite drainage is put to a beneficial use without need for a permit or impeding a surface water right. Water can also be harvested on County lands and diverted pursuant to the surface water rights framework, such as is done at the Kino Environmental Restoration Project (KERP) facility or at stock ponds on County ranches.

The Sustainable Action Plan encourages Pima County to harvest rainfall and runoff at County facilities, and water harvesting is a technique the County would like to use in design of new projects, when feasible. RFCFD and the Natural Resources, Parks and Recreation Department (NRPR) are increasingly looking to use water harvesting as a source of water for landscaping and riparian restoration.

At this time, there is no inventory of County water harvesting activities outside the surface water rights framework, and developing an inventory would be a useful effort.

2. http://www.pimaxpress.com/Planning/ComprehensivePlan/PDF/Policies_Legend/Policies_2007_Reg_Policies.pdf

3. http://www.rfcd.pima.gov/wrd/planning/pdfs/wrpolicyres2008_72.pdf

4. http://www.pimaxpress.com/Documents/Green/Sustainability_Resolution.pdf

5. Phase 2 Final Report Water & Wastewater Infrastructure, Supply & Planning Study, City of Tucson and Pima County, December 2009. http://www.tucsonpimawaterstudy.com/Reports/Phase2FinalReport/PHASE2report.12-09FINAL_Ig.pdf

Water Rights Team

Water rights are an increasingly valuable asset that should be recorded, tracked and managed. The County manages its Water Resources and Well Inventory with a multi-departmental group of staff called the Water Rights Team (part of the Water Management Committee established by F 54.9). Members of the team consist of staff from those County departments that have roles and responsibilities for water rights and wells:

Department of Environmental Quality – Solid Waste (DEQ)
Facilities Management (FM)
Office of Sustainability and Conservation (OSC)
Stadium District
Natural Resources, Parks and Recreation (NRPR)
Pima County Attorney Office (PCAO)
Regional Flood Control District (RFCD)
Regional Wastewater Reclamation Department (RWRD)
Real Property Services (RPS)

Water Resources Asset Database (WRAD)

Through the collaborative effort of the Water Rights Team, a comprehensive inventory of current water rights and wells relating to surface water, groundwater and reclaimed water has been compiled in an Access database. Continued interdepartmental coordination and a process to formalize responsibilities for maintaining the inventory is needed. The current inventory is a dynamic, changing catalog because the County acquires property with appurtenant Surface Water Rights, Groundwater Rights and groundwater wells on an ongoing basis. Because water rights acquisitions and the legal process of defending claims are continuous, the inventory continues to change with time.

Real Property Services is working with Pima County's Information Technology Department and the Procurement Department to acquire a comprehensive database that would include County and RFCD-owned water rights (Water Resources Asset Database). The database should have the capability to be sorted by various parameters for managing departments' use in matching available water rights to water uses.

The proposed database should have the capability to match Type 2 Groundwater Rights to groundwater wells. The County should support transition to this new database to replace the current RFCD-developed Water Resources and Well Inventory database, which has limited capabilities.

Some of Pima County's share of effluent generated at the Metropolitan Area Facilities is delivered to County facilities by Tucson Water under a wheeling agreement approved in 2003. County sites receiving reclaimed water should also become part of the WRAD database along with the Tucson Water Reclaimed Water User Agreements and account information. Currently, the departments using reclaimed water and the rates they are charged are unclear at best and this information's accuracy has not been confirmed as additional sites were added to the reclaimed water delivery system. Once the Water User Agreements, accounts and rates are resolved, the addition of this information should be included in WRAD to monitor the amount of reclaimed water Pima County is putting to beneficial use.

Ultimately, the Water Resources Asset Database (WRAD) can be used to make management decisions regarding the use of water rights, reclaimed water and underground storage credits to

advance the goals and policies of managing and protecting the County's resources.

Drought and Climate Variability

In June 1999, then Governor Jane Hull declared a drought emergency that remains in effect today (PCA 99006). The Arizona Drought Preparedness Plan defines drought as a "sustained, natural reduction in precipitation that results in negative impacts to the environment and human activities."⁶ Arizona, like much of the western and southern United States, remains in a multi-year drought.

In support of the State's Drought Preparedness Plan, Local Drought Impact Groups (LDIG) were created by the Arizona Department of Water Resources (ADWR) in 2006-2007. Pima County's LDIG meets the second Wednesday of every other month. Agendas and meeting recaps, as well as links to drought information and news, can be found on the County's Drought page. <http://www.pima.gov/drought/index.html>

During the summer of 2006, the Board of Supervisors adopted a Drought Response Plan that included an ordinance (2006-043) establishing response measures for drought and prohibitions against water wasting.

In 2007, Pima County declared a Drought Stage 1, the public was asked to reduce water consumption, restaurants were asked to provide water only on request and hotels/motels were urged to conserve water. Even though the State has experienced drought conditions for more than a decade, Pima County and the County's major water providers remain at a Drought Stage 1 declaration.

In recent years, scientists have made a clear link between drought and climate variability and have speculated as to whether drought events will become more of the "normal" weather patterns in the southwestern regions of the United States. Drought is not a rapid onset condition, and each region reacts differently according to the condition of its watershed and water supply, delivery system and backup supplies.⁷

Climate change will impact the water supply in several ways. Drier winters will diminish the natural recharge of the underground aquifers. Reduced snowfall in the Rockies and other mountain ranges in Arizona and New Mexico will result in less water flowing into the area's reservoirs. A shift toward earlier snowmelt due to warmer temperatures will extend the dry season before the summer monsoon, stressing water supplies and increasing demand for water during this period. With higher temperatures, evaporation rates will increase affecting lakes, reservoirs, soil moisture and plants.⁸

Drought and climate variability are predicted to impact our part of the world in many different ways including the vulnerability of Pima County's economic and social sectors, current trends in water use, environmental concerns, wildlife impacts and the availability of water resources, but should not change Pima County's current water rights.

WRAMP Action Items

1. *County Administrator to authorize the Water Management Committee and the Water Rights Team's continued involvement in identifying water management needs and opportunities that would advance the policies and goals set by the County Administrator and the Board of Supervisors.*

6. http://www.azwater.gov/AzDWR/StatewidePlanning/Drought/documents/operational_drought_plan.pdf

7. <http://cms3.tucsonaz.gov/sites/default/files/water/2010%20Drought%20Report%20wt%20cover.pdf>

8. <http://www.southwestclimatechange.org/impacts/people/drought>

2. *The County needs a comprehensive Water Rights Assets Database to document and monitor the use of Pima County's Surface Water Rights, Groundwater Rights, Groundwater Wells, reclaimed water and Long-Term Storage Credits. It is recommended that acquisition, implementation and funding for WRAD be pursued.*
3. *Surface Water and Groundwater Rights are valuable assets that Pima County should use for public purposes (such as parks) that benefit Pima County residents and to protect groundwater dependent ecosystems. Unused Surface and Groundwater Rights may have strategic value or future value that should be considered before they are disbursed.*
4. *The County should evaluate its water supply and demand, including water purchased from the region's water providers, and identify the most cost effective and best use of water and water resources including reclaimed water.*
5. *New uses or significant changes in the use of water resource assets should be referred to the Water Management Committee for a recommendation to the County Administrator.*
6. *Pima County must monitor and fully participate in the Gila River General Adjudication⁹ process and be prepared to defend its surface water rights. The adjudication may impact our surface water rights and some groundwater rights.*
7. *Ownership of reclaimed water from sub-regional area wastewater reclamation facilities must be resolved through negotiation with the City of Tucson. Opportunities exist to use reclaimed water beneficially from these facilities, but plans cannot proceed without resolution of this issue.*
8. *A strategic plan for the use of Pima County's share of reclaimed water is needed. Strategies that sustain flows in the Santa Cruz River, replace groundwater use, restore riparian areas and replenish the aquifer are all desirable and competing uses for reclaimed water. An appropriate balance that contributes to the sustainability of the region needs to be developed.*
9. *Pima County has accrued Long-Term Storage Credits since 2003. Strategies for the use of these credits are needed. These plans should also include criteria under which proposals to obtain credits are evaluated.*
10. *The diverse portfolio of county water resources involves several county departments that use, develop and acquire water resources. The Water Management Committee is needed to ensure opportunities to use renewable water resources on multi-use, public benefit projects are optimized when renewable water infrastructure is extended.*
11. *Pima County should continue its Drought Management Plan and support of the Local Drought Impact Group's (LDIG) efforts to educate, monitor and minimize drought and climate variability effects in southern Arizona.*
12. *Pima County's legislative agenda should reflect water resource issues important to southern Arizona such as:*
 - *Notification of newly drilled, non-exempt wells requiring evaluation on potential impacts to riparian areas and/or County/RFCD-owned lands*
 - *Elimination of the 50 percent cut to the aquifer for Southern Arizona Water Rights Settlement Act (SAWRSA) effluent*
 - *In-lieu credit for conversion of turf irrigation or landscape irrigation from groundwater to reclaimed water*
 - *Rain and stormwater harvesting*
13. *Pima County should participate in the development of ADWR's Fourth Management Plan to advance the goal of safe yield by 2025 and to promote consideration of the localized impacts of water resources management, instead of focusing solely on basin-wide impacts.*



9. Gila River Adjudication is a judicial proceeding in which the priority of Surface Water Rights for the Gila River and its tributaries, including the Santa Cruz River and San Pedro River, will be determined. <http://www.superiorcourt.maricopa.gov/SuperiorCourt/Adjudications/whatsNew.asp>

SECTION I – SURFACE WATER

In the Southwest, there are four categories of water supplies – Colorado River water, surface water (other than Colorado River water), groundwater and effluent.¹⁰ The Central Arizona Project (CAP) is designed to bring about 1.6 million acre-feet (AF) of Colorado River water to Pima, Pinal and Maricopa counties.¹¹ Several Pima County water providers and farmers have CAP allocations, but Pima County government and the Regional Flood Control District do not.

Arizona Revised Statutes §45-101 (9) define surface water as:

“...waters of all sources, flowing in streams, canyons, ravines or other natural channels, or in definite underground channels, whether perennial or intermittent, floodwater, wastewater, or surplus water, and of lakes, ponds and springs on the surface”

There are four general types of surface water – perennial, intermittent, ephemeral and effluent-dependent flow. Surface water provides 54 percent of water used in the state.¹²

Perennial streams have year-round flow and intermittent streams may have periods of sustained flow, particularly during wet periods and generally flow over an alluvial basin with high groundwater levels. Ephemeral streams are short-lived and flow only during storm runoff.¹³

Effluent-dependent streams, such as the Santa Cruz, rely on treated discharge (reclaimed water) from wastewater treatment facilities.

Surface Water Rights in Arizona are regulated under Title 45 of Arizona Revised Statutes. Arizona Department of Water Resources (ADWR) issues permits and certificates for rights to use surface water within the State of Arizona, excluding the Colorado River. ADWR also manages and maintains the Surface Water Rights registries.

Surface Water Rights, as designated by ADWR, are distributed across Pima County and are primarily associated with ephemeral watercourses (Figure 1). Surface Water Rights are also associated with natural springs and artificially constructed stock tanks or surface water diversions. In all, the County has filed surface water rights for about 6,000 acre-feet.¹⁴ The County and RFCD use Surface Water Rights for recreation, wildlife, stock and irrigation purposes at a variety of public use areas.

Retaining Surface Water Rights can provide a tool for accomplishing public objectives, such as the protection of streams and the authorization to divert stormwater for new purposes. RFCD has been successful in obtaining new Surface Water Rights for these purposes.

The County and RFCD have increased their collective production and use of various types of water as new parks, wastewater reclamation facilities and riparian restoration projects have been created.

The County and RFCD have also inherited ownership of Surface Water Rights attached to land acquired for other public purposes, such as parks, open spaces or rights of way.

Table 1 shows the distribution of Surface Water Rights, claims and Statements of Claimant by department as identified in the 2010 Water Resources and Well Inventory.

For each right or claim, there should be a Statement of Claimant (SOC) on file with ADWR.

Table 1 – Surface Water Rights Summary 2010¹⁵

Managing Department	Certificated Rights (acre-feet)	Permitted Rights (certificate pending) (acre-feet)	Claim (acre-feet)	Stock Pond (acre-feet)	Total Filings Amount (acre-feet)	Statement of Claimant Under Gila River Adjudication (39) ¹⁶ (acre-feet)
RFCD	1,416.34	0.00	3,808.05	0.00	5,224.39	12,275.06
DOT	0.00	0.00	0.00	0.00	0	120.00
FM	0.00	0.00	0.00	0.00	0	2.00
NRPR	62.67	0.00	97.54	32.92	193.13	120.28
RWRD	0.00	0.00	0.00	0.00	0	51,909.22
Stadium District	0.00	582.4	0.00	0.00	582.4	0.00
PC Total	1,479.01	582.4	3,905.59	32.92	5,999.92	64,426.56

Certificated Rights are the most secure, having full documentation approved by ADWR. Permitted Rights are those already in the process of becoming certificated by ADWR. Pima County and RFCD hold 2,061 AF of Certificated Rights and Permitted Rights (certificates pending).

The greatest quantity of Surface Water Rights are related to Statements of Claimant for discharges from the Roger and Ina Road reclamation facilities where there are no corresponding claims at ADWR (see Table 1, RWRD highlighted). This situation should be addressed with assistance from Pima County Attorney’s Office.

A Statement of Claimant must be filed for every Surface Water Right held by Pima County. As new acquisitions occur, there will be a continued need for evaluation of appropriate documentation on County or District lands. Those rights currently in Permitted Rights status need to have their uses documented so that Certificates can be issued by ADWR.

Stock pond claims are typically filed to support livestock operations. Pima County’s stock pond claims are associated with open space ranches acquired under the Sonoran Desert Conservation Plan (SDCP). Staff should check that all stock ponds have a Surface Water Certificate

Action Items

1. Real Property Services should file corrections to Surface Water Rights claims in cooperation with the managing department as in the case of Regional Wastewater Reclamation Department’s Statement of Claimant of nearly 52,000 AF (Table 1 above).
2. Real Property Services should file Surface Water Rights changes supporting existing uses such as wildlife and recreation enhancements and points of diversion in cooperation with the managing department such as NRPR.
3. Managing departments should provide location information for Surface Water Rights with the use of GPS.

A map of Pima County’s Surface Water Rights is shown in Figure 1.

10. http://www.azwater.gov/AzDWR/StatewidePlanning/Drought/documents/Statewide_Water_Conservation_StrategyFINAL100804.pdf

11. <http://www.cap-az.com/>

12. http://www.azwater.gov/AzDWR/IT/documents/Layperson’s_Guide_to_Arizona_Water.pdf

13. *The Ribbon of Green, Change in Riparian Vegetation in the Southwestern United States*, Webb, Robert H., Leake, Stanley A. and Turner, Raymond M.

14. An acre-foot of water is approximately 325,851 gallons or enough water to meet the needs of three average Tucson families for one year.

15. *Update of Water Rights and Wells Inventory – 2010*

16. ADWR Program 39 designates a Statement of Claimant.

appropriate approximately 6,000 AF of surface water. Surface Water Rights are valuable assets that should be put to beneficial public uses like riparian projects, current and future use on parks, and protection of shallow groundwater. Examples could include protecting an in-stream right for the Cienega Creek Natural Preserve; protecting the shallow groundwater and spring at Bingham Cienega by invoking the San Pedro in-stream right for this preserve; protecting and preserving the Kino Environmental Restoration Project Surface Water Right and purchasing and retiring more Groundwater Rights in shallow groundwater areas such as Arivaca, Cienega Creek, Tanque Verde and Pantano Wash areas. These rights are important and will increase in value over time.

These rights are also used for recreation, livestock and wildlife watering, irrigation and riparian restoration. Some of these rights are related to open space acquisitions including ranches managed by Natural Resources, Parks and Recreation (NRPR). It is important that these Surface Water Rights be preserved to support valuable habitat, to protect in-stream flows, to meet the County's conservation goals and provide natural resource protection.

RFCD also has Surface Water Claims relating to stormwater detention basins and in the Bingham Cienega.

NRPR has Surface Water Claims on springs, reservoirs and stock tanks on property acquired under the Open Space Program.

Pima County is contemplating a proposal to acquire additional water rights along Cienega Creek and Arivaca Creek in a future bond election specifically for the purpose of protecting or restoring stream flows. The creation of new Surface Water Rights can also be a tool for accomplishing public objectives, such as the protection

of streams and the authorization to divert stormwater for multi-use public projects. RFCD has been successful in obtaining new Surface Water Rights for these purposes.

Action Items

1. When the San Pedro subflow zone delineation is finalized and groundwater wells within the saturated Holocene alluvium are identified, the County Attorney's Office should take necessary actions to ensure Pima County and RFCD's rights are protected and that the wells have the required Surface Water Rights
2. When ADWR proposes a subflow zone delineation for the Santa Cruz River, the following actions should be taken:
 - Water Rights Team should review ADWR's proposed subflow zone and submit comments, if appropriate.
 - Real Property Services and the County Attorney's Office should file any Statements of Claimant (SOC) not yet filed to cover County wells that appear to be in the subflow zone.
 - The County Attorney's Office, with technical assistance from managing departments, should confirm groundwater wells within proposed subflow zone or wells with cones of depression that extend into the saturated Holocene alluvium.
 - Real Property Services, together with the managing department, should submit the appropriate surface water filings with ADWR for each groundwater well within the potential subflow zone.
 - Pima County must fully engage in the Gila River General Adjudication process and be prepared to defend its Surface Water Rights claims.
3. A coordinated effort is needed to ensure that all Statements of Claimant are filed with ADWR and are accurate and complete.



SECTION II – GROUNDWATER

Another major source of Arizona’s water can be found in groundwater aquifers that provide approximately 43 percent of the State’s water supply. Estimates of groundwater in Arizona range as high as 900 million AF but that does not mean this water is readily available. It depends on location, depth and quality. Arizona has historically pumped more water from the ground than nature can recharge,¹⁷ a situation sometimes referred to as “mining” or “overdrafting” groundwater.

Arizona Revised Statutes §45-101 (5) defines groundwater as:

“... water under the surface of the earth regardless of the geologic structure in which it is standing or moving. Groundwater does not include water flowing in underground streams with ascertainable beds and banks.”

The 1980 Arizona Groundwater Code¹⁸ recognized the need to manage aggressively the State’s finite groundwater resources to support its growing population.

The Groundwater Management Code (Code) has three primary goals:

1. Control severe overdraft occurring in many parts of the state
2. Provide a means to allocate the State’s limited groundwater resources to meet most effectively the changing needs of the state
3. Augment Arizona’s groundwater through water supply development

Areas with heavy reliance on mined groundwater resulting in declining water tables were identified and designated as Active Management Areas (AMAs). The boundaries of AMAs generally are defined by groundwater basins and sub-basins rather than by the political lines of cities, towns or counties.

There are five AMAs: Prescott, Phoenix, Pinal, Tucson and Santa Cruz. The AMAs include 80 percent of Arizona’s population and 70 percent of the State’s groundwater overdraft.¹⁹ These areas are subject to regulation pursuant to the Groundwater Code, ARS 45, Chapter 2.

In the Phoenix, Prescott and Tucson AMAs, the primary management goal is safe yield by the year 2025. Safe yield is accomplished when no more groundwater is withdrawn than is annually replaced.

As shown in Figure 2, Pima County includes areas within three different Active Management Areas – the Tucson Active Management Area, the Pinal Active Management Area and the Santa Cruz Active Management Area.

The Tucson Active Management Area (TAMA) covers 3,866 square miles in southern Arizona, includes most of the populated urban areas of Pima County and is characterized by broad, gently sloping alluvial basins separated by north to northwest trending fault block mountains. There are two groundwater sub-basins in the AMA, the Avra Valley Sub-basin and the Upper Santa Cruz Sub-basin.²⁰

Determining who may pump groundwater and how much may be pumped is a vital part of the AMA’s water management. This involves identifying existing water rights and providing a means for water users to initiate new withdrawals. Within an AMA, a person/entity must have a Groundwater Right or permit to pump groundwater legally.

Groundwater Rights within AMAs are more complicated than the rights outside of an AMA. Three types of rights are derived from past water use and are known as Grandfathered Rights.

The County holds several types of historic water rights within the three AMAs described as follows:

- *Irrigation Grandfathered Rights (IGR) confer the privilege to use a specific number of acre feet of groundwater to grow crops on specific plots of land that had been irrigated with groundwater between 1975 and 1980. An Irrigation Grandfathered Right is appurtenant to and may not be sold apart from the associated land.*
- *Type 1 Non-irrigation Rights are rights once used for irrigation but permanently retired from farming and converted to a non-irrigation use, such as a housing development. These rights may be conveyed only with the land to which they are appurtenant. The maximum amount of groundwater that may be pumped each year using a Type 1 right is three AF per acre of land.*
- *Type 2 Non-irrigation Rights can only be used for non-irrigation purposes. These are more flexible than IGRs or Type 1 Rights as they may be sold apart from the land. If a Type 2 Right is sold, it may not be divided; the entire right must be sold.*

A Type 2 is a right based on groundwater non-irrigation uses between 1975 and 1979. Type 2 Non-irrigation Grandfathered Rights may be transferred to new locations within the same active management area through either a sale or lease.

Pima County has over 4,216 AF of Irrigation Grandfathered Rights, 2,566 AF of Type 1 Non-irrigation Rights and 994 AF of Type 2 Non-irrigation Rights. Table 2 shows Groundwater Rights and groundwater wells owned and managed by various county departments.

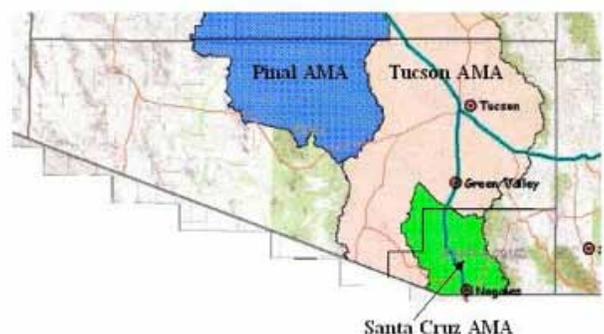
Figure 3 shows the location of Pima County’s and RFCD’s Irrigation Grandfathered Rights and Type 1 Non-irrigation Rights. Type 2 Rights are not geographically shown because they are not appurtenant to the land.

An additional water right, Service Area Rights, is not used extensively by Pima County. Domestic water is governed under the classification of Service Area Rights. Service Area Rights authorize cities, towns, private water companies and irrigation districts to withdraw groundwater to serve their customers. The County holds Service Area Rights at just one location, Colossal Cave Mountain Park, which provides drinking water for the visitor center.

Groundwater Wells

Outside of the State’s AMAs, Groundwater Rights are relatively simple. Drilling a new well to pump groundwater requires a Notice of Intent to Drill filed with the Arizona Department of Water Resources. Groundwater wells are portals to the aquifer; therefore, ADWR conducts an analysis of the proposed well site to insure that the proposed well will not present a groundwater contamination

Figure 2 – Active Management Areas in Pima County



17. http://www.azwater.gov/AzDWR/IT/documents/Layperson's_Guide_to_Arizona_Water.pdf

18. <http://www.azwater.gov/AzDWR/WaterManagement/AMAs/TucsonAMA/TAMAOverview.htm#description>

19. http://www.azwater.gov/AzDWR/WaterManagement/documents/Groundwater_Code.pdf

20. <http://www.azwater.gov/AzDWR/WaterManagement/AMAs/>

risk. Within an AMA, a groundwater right must be associated with the groundwater withdrawn from a well.

Table 2 – Groundwater Rights and Wells Summary 2010²¹
(acre-feet, unless otherwise noted)

Managing Department	IGR ²²	Type 1	Type 2	Other ²³	Non-Exempt Wells (#)	Exempt Wells (#)	Other Wells ²⁴ (#)
RFGD	509.9	2,565.62	16.6	0.00	24	58	104
DOT	17.34	0.0	0.0	0.00	7	4	1
FM	0.00	0.0	31.0	0.00	5	4	1
NRPR	2,873.91	0.0	744.3	65.80	38	108	4
Real Property	58.96	0.0	24.0	0.00	9	24	19
Stadium District	0.00	0.0	0.0	293.00	0	0	0
RWRD	755.96	0.0	178.0	0.00	5	93	58
DEQ/SW	0.00	0.0	0.0	0.00	3	9	0
Total	4,216.07	2,565.62	993.9	358.80	91	300	187

The County holds a number of withdrawal permits. These permits allow yearly withdrawals of groundwater for non-irrigation use within the AMAs.

Exempt wells pump groundwater that is not used for crop or agricultural irrigation, have a maximum pump capacity of 35

gallons per minute or less and are exempt from ADWR reporting requirements.

Non-exempt wells must report withdrawals annually to ADWR and can be subject to pumping limitations. Pima County owns both exempt and non-exempt wells. Many of its exempt wells are monitor wells.

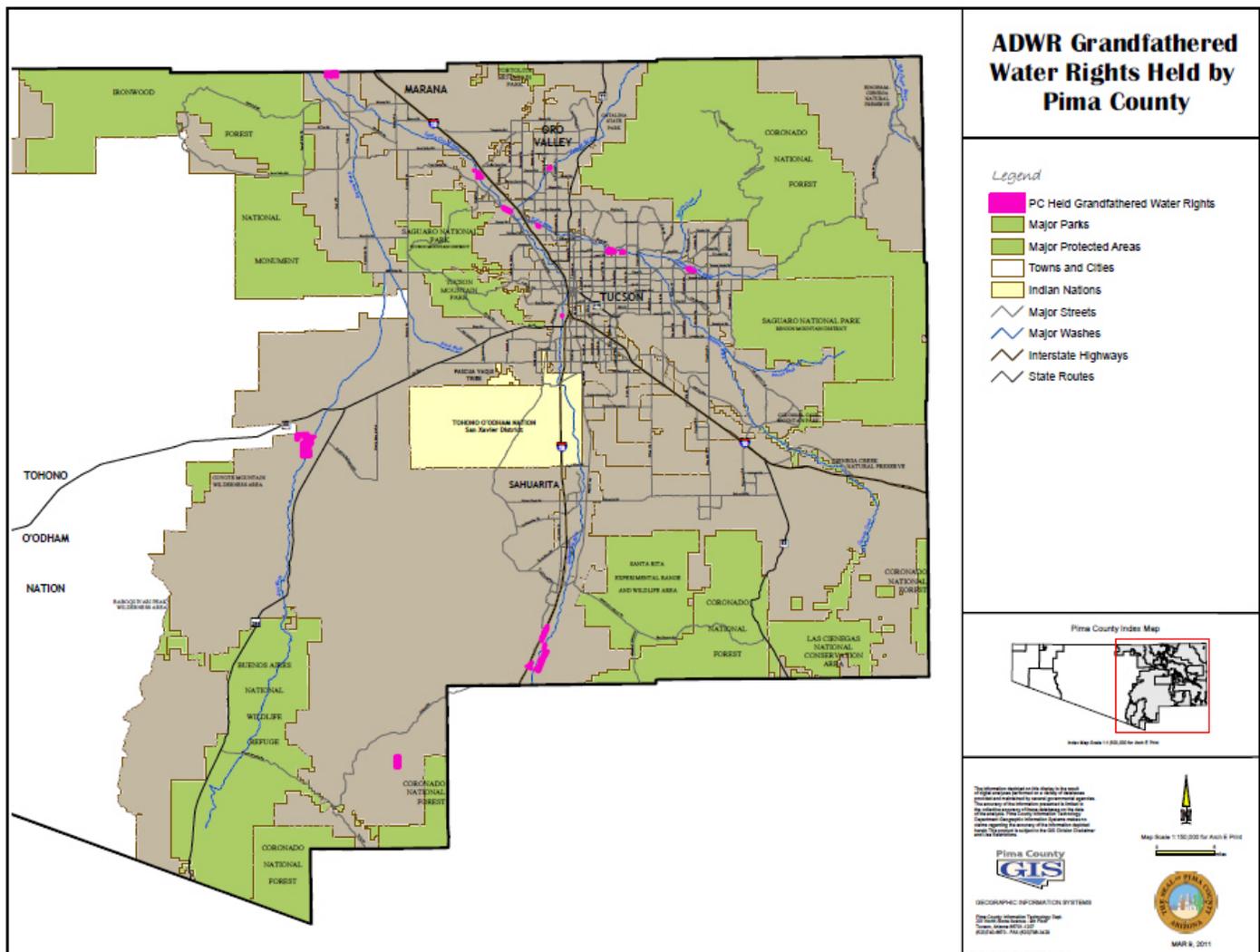
Pima County's non-exempt wells are used for a water supply to various operations and are subject to ADWR reporting requirements and pumping limitations.

Pima County holds rights to about 994 AF of Type 2 rights used to irrigate County parks, for dust suppression at landfills and to supply water at various County facilities.

Pima County also withdraws groundwater under permits not associated with a groundwater right. These withdrawal permits allow the County to pump groundwater for non-irrigation use within the AMAs for activities such as dewatering, general industrial use and pumping of poor-quality groundwater. Such instances are listed in Table 2 as "Other Wells."

Each County department must comply with State requirements in connection with the wells it manages. These include reporting changes to the ownership, groundwater pumping limitations and uses of wells.

Figure 3 – Map of Pima County Groundwater Rights



21. Water Rights and Well Inventory, 2010
22. Irrigation Grandfathered Rights

23. Includes emergency dewatering, general industrial, hydrologic testing and individual user wells.
24. Includes geotechnical, piezometers, monitoring, utility and drilled wells.

Each department also administers efforts to assure that the aquifer is protected during the use of its wells. Open access wells or poorly constructed wells can be threats to public health, safety and the environment, and represent potential liabilities to the County.

Each department should conduct a formalized condition assessment of each well they have under their management with the goal of completing assessments within the next five years. A condition assessment may determine the number of wells that cannot be located or are missing and could also determine well or site conditions in need of repair or mitigation.

Additionally, using GPS (global positioning system) technology, staff is engaged in field identification of all wells to obtain locations that are more precise and to assess the need for wellhead protection from contamination or damage.

The County's Open Space Resolutions may specify the use of water assets and water rights. The specified uses should be monitored to ensure compliance with resolutions.

Action Items

1. *Managing departments should conduct field identification of all groundwater wells which should be completed, including GPS coordinates to obtain a more precise location, to verify the groundwater well exists and to confirm consistency with ADWR's well registry.*
2. *County personnel should perform a condition assessment to protect the wellhead from contamination or damage and assess well sites in need of repair or mitigation. RFCD's condition assessment program can be used as a model to develop a Standard Operating Procedure (SOP) for all managing departments to apply to their wells.*
3. *Pima County should provide funding for protecting against groundwater contamination from open access, damaged, neglected, poorly constructed or improperly cared for County/RFCD-owned wells.*
4. *Groundwater Rights that have specific conditions should be monitored to ensure those conditions are being met. The conditions can be specified through lease agreements, management plans or Board-approved resolutions. These conditions should be included in the Water Resources Asset Database.*
5. *Groundwater Rights that have no specific conditions should be noted in the Water Rights Asset Database. These may be available for use in future County/RFCD operations.*
6. *The Water Rights Committee should develop a consistent procedure for tracking groundwater resources the County or RFCD leases to others. It would include the amount of water leased annually, use restrictions, type of water right, term of lease agreement, wells to be used, payment terms, reporting requirements, and any other pertinent information.*
7. *Groundwater Rights should be identified as associated to an enterprise fund or general fund operation and a data field included in the new Water Resources Asset Database.*

Asset Management

Groundwater wells and water rights are assigned to a managing department based on historical acquisition and use. Departments are individually responsible for the operation and maintenance of the wells they manage.

Each managing department is also responsible for reporting annual non-exempt well usage data to ADWR and paying the appropriate groundwater withdrawal fees. A copy of the report is provided to Real Property Services. Real Property Services has specific responsibilities to report changes in well ownership to ADWR.

Each department is responsible for filing with ADWR all Notices of Intent to drill, abandon or close a well. A copy of the notice should be provided to Real Property Services so it can be added to the Water Resources Asset Database.

Turf facilities greater than ten acres are regulated by ADWR and water usage must be reported annually. NRPR and the Stadium District report this water usage to ADWR. Incorporating the water usage in a database would provide management a baseline of how much water the County uses in its day-to-day operations.

As recommended in Pima County's Sustainable Action Plan, the Facilities Management Department has acquired a utilities management software package, EnergyCAP. This program will have the capability to document water usage and water billing for all county departments. Data from this program will help departments manage water usage more effectively.

Action Items

1. *Pima County has an interest in protecting groundwater-dependent ecosystems. One way to do this is for the County to purchase groundwater wells near these sensitive areas and permanently retire the Groundwater Rights associated with them. A precedent for this type of approach to public resource protection exists in the County's programs for flood-prone land acquisition and open space conservation lands.*
2. *After undergoing a thorough and careful analysis by the Water Management Committee, the County may wish to retire some Groundwater Rights to preserve groundwater in hydrologically sensitive areas.*
4. *Each managing department should provide Real Property Services a copy of Notices of Intent to drill wells, abandon wells and/or close a well filed with ADWR and the information included in the Water Resources Asset Database inventory (WRAD).*
5. *Managing departments that report irrigation amounts to ADWR should record this information in WRAD, effectively making WRAD the central clearinghouse for all water resources-related data. A specific procedure should be established so designees from managing departments can access data.*
6. *Real Property Services should follow up on annual reporting to ensure all County/RFCD-owned Groundwater Rights are properly reported to and recorded by ADWR.*
7. *A procedure should be developed for tracking the destination and amounts of groundwater, surface water and reclaimed water. This information could be used to establish a baseline of Pima County's water supply sources to measure its use of renewable water, reclaimed water use and compliance with sustainability goals*
8. *Using a utility software program, such as EnergyCAP, the County and RFCD should track the amount of water purchased from water providers to evaluate whether water resources used are the most cost effective and best use for the public benefit.*
9. *The Water Rights Team should develop a flow chart showing the process for tracking water rights and groundwater wells should be developed to document the process and to identify the County's and RFCD's responsibilities.*

New Water Rights and Groundwater Well Acquisitions

Pima County acquires real property for various purposes that may have water rights or groundwater wells. Recent acquisitions under the Open Space Program have included land with Surface Water Rights, Groundwater Rights and groundwater wells. Land purchased under RFCD's Flood Plain Acquisition Program may also have Groundwater Rights and groundwater wells. These water assets are added to the County's Water Resources and Wells Inventory.

When land acquisitions are made, Real Property Services has developed procedures to identify and transfer water rights from the previous owners. The procedure used by Real Property Services ensures that water rights acquired with real property are transferred and added to the inventory and assigned to a managing department. The procedure includes the following:

- *Real Property Services notifies the appropriate managing department before a property is purchased that has an existing well and/or Water Right associated with it.*
- *Real Property Services obtains the Water Rights documentation, files the Water Rights ownership change with ADWR, updates the Water Resources and Wells Inventory and notifies the managing department.*
- *Pima County Department of Environmental Quality conducts a Phase 1 Environmental Assessment on behalf of the managing department.*
- *The managing department conducts an inspection and assessment of the well condition, and, if necessary, requires the owner to make improvements before the sale is completed or makes recommendations regarding the condition of the well.*
- *The managing department notifies RFCD, which then updates the Water Resources and Wells Inventory.*

Maintaining an updated asset inventory of water rights and groundwater wells is necessary in order to manage these assets effectively. When a new groundwater well is drilled, there should be a documented process to ensure the well is added to the Water Resources Asset Database. Conversely, when a County/RFCD-owned well is no longer needed, a procedure should be in place to ensure the closure is properly documented and the Water Resources Asset Database updated.

Water rights associated with property leased by the County (e.g., State grazing leases) are not included in the County's Water Resources and Wells Inventory as they are not County/RFCD-owned assets. These may be included at some later date for tracking purposes only.

Action Items

1. *When a new well is drilled, a procedure for including it in the Water Resources Asset Database should be established. The managing department should provide Real Property Services the information submitted to ADWR. The managing department should be responsible for adding the new well to WRAD along with the associated data fields.*
2. *When an existing well is capped or abandoned, a procedure for reflecting that change in WRAD is needed. The managing department should be responsible for updating WRAD to describe the well as capped or abandoned.*
3. *The procedure for acquiring wells should be consistently applied to all departments.*

Potential Impacts of New Wells on Adjacent County Property

The drilling of new, non-exempt wells by others has the potential to impact neighboring wells or riparian areas. Occasionally, ADWR posts a notice of well drilling. Within an Active Management Area, ADWR requires non-exempt wells to provide a drawdown analysis and if an existing well is within a theoretical ten-foot drawdown contour after five years of pumping, that well owner must be notified. Pima County and RFCD have an interest in being notified when new, non-exempt wells are drilled by others adjacent to Pima County or RFCD lands.

An example of ADWR's notification process occurred near Agua Caliente Park. Because existing well owners had concerns about a proposed well, ADWR modified the well pumping requirements so surrounding well owners would not be adversely impacted. Other than the drawdown requirement, there is no notification to well owners and no process for evaluating the impacts of proposed non-exempt wells.

The rules for non-exempt wells are more restrictive. Non-exempt wells must complete a hydrologic impact analysis to ensure the new well will not impact existing wells, including existing exempt wells.

In 2005, ADWR amended the rules regarding spacing of wells (ACC R12-15-830B) in response to concerns about exempt wells. When a new exempt well is proposed to be drilled, the impacts on other wells are not considered. Municipal water providers are also concerned about the proliferation of exempt wells within their service areas.

During the rulemaking process, Pima County submitted comments to ADWR addressing two issues:

1. *County lands and infrastructure can be harmed by excessive drawdown. The rules give no opportunity to provide data as to whether unreasonable harm is occurring or has occurred due to excessive drawdown. Pima County noted that the impacts of groundwater pumping to riparian areas are not considered and proposed the Well Spacing Rules be amended to consider these impacts.*
2. *The rules ignore the impact of new wells on surface water users. Some water that is pumped through groundwater wells is actually surface water regulated under the prior appropriation doctrine. Pima County recommended that the Well Spacing Rule be amended to require that new non-exempt wells located in the younger floodplain Holocene alluvium or with a cone of depression that extends into the younger alluvium be supported by a properly filed water rights claim.*

Neither recommendation was implemented in the revised Well Spacing Rules. The issues identified above are still relevant today and should be pursued.

Additionally, there is no notification to adjacent well owners of proposed exempt wells nor is there a process to evaluate the impacts to adjacent riparian areas. Suggestions for how the County can be notified of proposed new wells are needed.

Action Items

1. *Legislation is needed to require the evaluation of impacts of proposed non-exempt wells near County or RFCD property. The evaluation would determine if there are impacts to:*
 - *County- or RFCD-owned wells*
 - *Riparian areas**Any proposed change to the regulation should also require that nearby landowners, including Pima County and RFCD, be notified of any application for a new, non-exempt well.*
2. *ADWR, Real Property Services and the managing department should be notified if there are impacts.*
3. *Administrative Procedures should be prepared for each of these actions.*
4. *Pima County should file a complaint for consideration during the sunset review of the Well Spacing Rule. The complaint can be filed at any time. The complaint would support amendments to the Well Spacing Rule that would provide protection for adjacent landowners who have been affected by declining shallow groundwater levels or impairment of Surface Water Rights. The*

complaint would also support improved notification procedures. If the Well Spacing Rule is revised, the County should participate in the process to support the above-mentioned goals.

5. *Water Rights team will write a procedure establishing the interdepartmental communication necessary to alert other departments about new, non-exempt wells that might affect County water rights or wells.*

Water Storage Facilities

Pima County and RFCDD lands often serve multi-purpose uses. Flood-prone lands along the County's watercourses may have optimum infiltration rates that make them ideal for underground storage of reclaimed water, CAP water or stormwater. Projects may involve either managed recharge, where water is passively recharged in the river channel, or constructed recharge, where substantial improvements to the land are made to maximize infiltration rates. Recharge is water that replenishes the aquifer.

ADWR allows Groundwater Savings Facilities (GSF), another type of water storage, to obtain long-term storage credits similar to constructed Underground Storage Facilities (USF) if the permittee replaces an existing use of groundwater with a renewable water supply instead of directly storing the water.

A GSF achieves the same overall objective as a USF – water stored underground for future use. However, the difference is that for a GSF, a volume of renewable water is used directly, allowing an equivalent volume of stored water to remain (or be saved) in place as groundwater, rather than being withdrawn for immediate use. Water supplied to a GSF in this manner is referred to as "in-lieu water" in Title 45 (see ARS §§ 45-802.01 and 45-812.01).

There are many GSF facilities permitted to use Central Arizona Project (CAP) water for agricultural irrigation in-lieu of groundwater that would have been pumped pursuant to a water right. With limited exceptions, ADWR will not give in-lieu credit to a GSF for conversion of turf irrigation or landscape irrigation from groundwater to reclaimed water. Although nothing in the statute seems to prohibit this approach, ADWR has not recognized turf or landscape irrigation as qualifying for GSF long-term storage credit. Recognizing turf or landscape irrigation for GSF long-term storage credits would provide an incentive for facilities, including some of Pima County's parks that are using groundwater, to convert to a renewable water source such as reclaimed or CAP water.

Pima County stores reclaimed water at managed and constructed recharge facilities (USFs) throughout the Tucson area and accrues Long-Term Storage Credits that it may wish to recover at some point in the future. Recovery of stored water is governed under ADWR statutes. One of the recovery provisions, (45-834.01.A.2.(b) (iii)), states that if stored water in an AMA is to be recovered through a proposed recovery well and the well is located outside the area of impact of the stored water and within the exterior boundaries of the service area of a city, town, private water company or irrigation district, the city, town, private water company or irrigation district must consent to the location of the recovery well. This part of the statute should be changed to better facilitate Pima County's eventual recovery well permitting. The statutory change should state that if the city, town, private water company or irrigation district is not harmed by the recovery; consent should not be required.

The Board of Supervisors must approve any agreements between other participants if recharge is to take place on County or RFCDD land. The current policy is to consider these on a case-by-case

basis and it should remain in place.

Action Items

1. *When appropriate, Pima County should pursue an amendment to ARS §§ 45-802.01 and 45-812.01 broadening the use of GSFs to include landscape and turf irrigation.*
2. *Pima County should look for an opportunity to amend ARS §§ 45-834.01 so that the consent of cities, towns, private water companies or irrigation districts is not needed for recovery of water stored at constructed or managed recharge facilities unless adverse impacts are demonstrated.*
3. *When the new Water Resources Asset Database is in operation, accrual and use of Pima County's Long-Term Storage Credits (LTSC) should be included and updated on an annual basis.*

Use and Disposal of Remediated Water

Groundwater contamination of wells at and adjacent to the former El Camino del Cerro Landfill was found as early as 1993. Pima County conducted remedial investigations and, working with the Arizona Department of Environmental Quality, began remediation activities to remove these contaminants in 2009. Remediated groundwater from this landfill is treated to drinking water standards. Following this expensive treatment, it is discharged to the wastewater system where it commingles with sewage and is re-treated at one of the metropolitan area wastewater reclamation facilities.

ADEQ rules allow discharge of remediated water into a reclaimed water distribution system, but the process is cumbersome. Under the current rules, an individual reuse permit would be required to discharge remediated groundwater into the reclaimed water distribution system.

A general permit would streamline the permitting process and allow for this water to be reused in a more cost-effective manner while not compromising public safety. Mitigating factors to consider include the costs to dispose, regulatory requirements, quality of water, availability and timing.

Options for the disposal of remediated water that should be considered include:

- *discharge to the sanitary sewer system*
- *discharge to the potable water system*
- *discharge to the reclaimed water system*
- *discharge to streams*
- *use in operations (such as sewer flushing or dust control)*
- *use in parks for irrigation*

Factors that should be considered for disposal or remediated water include beneficial uses for the benefit of the public and cost.

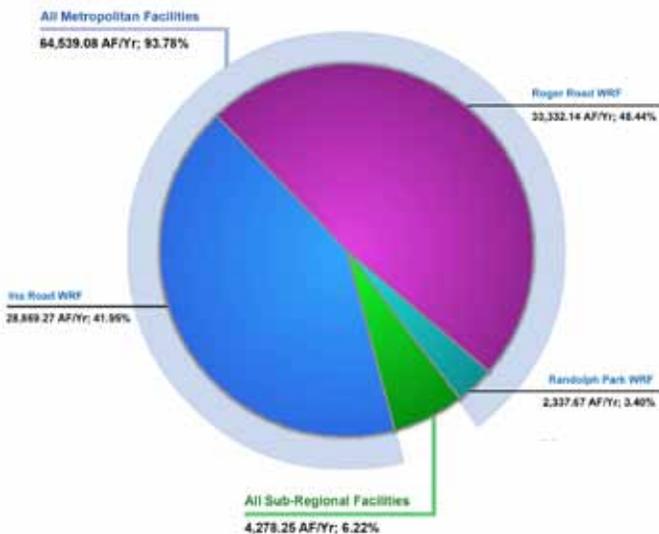
Action Items

1. *Pima County should continue to work with State Working Groups, ADEQ and ADWR to advance rule changes that facilitate the use of remediated water. ADEQ is likely to revise reclaimed water rules within the next several years and Pima County should be active as a stakeholder in that process.*

SECTION III – EFFLUENT and RECLAIMED WATER

Reclaimed water is a vital, locally generated, renewable resource and a key component in Pima County's available water resources. Reclaimed water, as defined in A.R.S. §49-201(32), is water that has been treated or processed by a wastewater treatment plant. This water resource is also sometimes referred to as "effluent." In 1989, the Arizona Supreme Court refused to characterize effluent as either surface water or groundwater, choosing instead to characterize it as "nothing more than sewerage effluent." This decision kept this part of the water supply from being regulated in the same manner as waters of the state. The Court held that cities do not "own" the effluent, but have the right to put it to a beneficial use.²⁵ Wastewater, treated to suitable reuse standards, makes up 3 percent of Arizona's water supply and its use is growing.²⁶

Figure 4: 2010 Pima County Reclaimed Water Generation



Pima County has legislative authority under ARS §11-264 to construct and operate the regional wastewater system in Pima County. As such, the County is the major producer of reclaimed water in eastern Pima County.

Reclaimed water is generally used for three purposes:

- reuse
- environmental enhancement
- aquifer augmentation

Pima County uses its reclaimed water, further processed and delivered through Tucson Water's reclaimed distribution system, to irrigate County parks, turf facilities and other landscape vegetation; to provide water for construction and dust control; and to sustain vegetation for environmental restoration projects. An additional use of the County's reclaimed water entitlement is long-term storage in underground storage (recharge) facilities. A reclaimed water plan for how the County will allocate its reclaimed water among these three uses is needed so that the County's priorities are clear.

The federal Clean Water Act, in Section 208, directs states to designate agencies to conduct water quality management planning in defined regions. The Areawide Water Quality Management Plan or "208 Plan," prescribes the provision of sewage treatment services in a manner that is consistent within the context of a predetermined planning framework.²⁷ RWRD is the designated management agency (DMA) in Pima County except for the Tohono O'odham Nation and Town of Sahuarita.

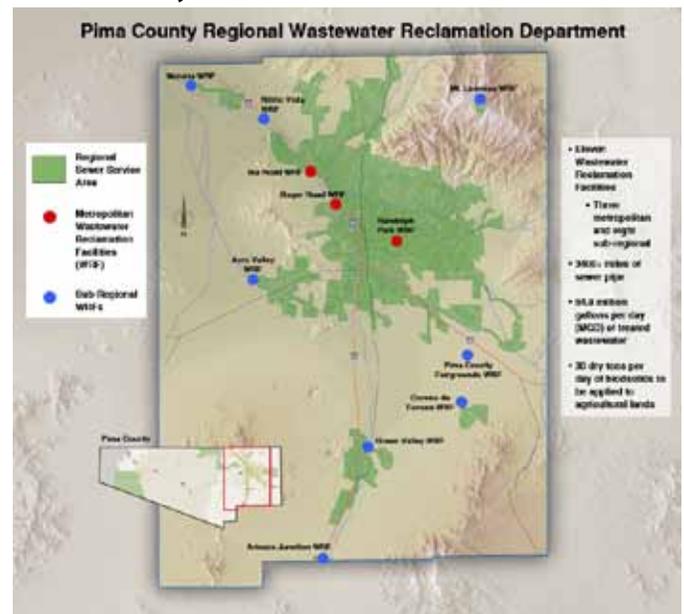
Pima County's Regional Wastewater Reclamation Department (RWRD) operated eleven wastewater reclamation facilities. In 2010, these facilities treated enough wastewater to produce 68,817 AF of reclaimed water.²⁸ These eleven reclamation facilities consist of three facilities serving the metropolitan Tucson area – Ina Road Wastewater Reclamation Facility (WRF), Roger Road WRF and Randolph Park WRF and eight sub-regional facilities serving outlying areas.

On January 3, 2012, the Town of Marana assumed management of the Marana Wastewater Treatment Facility from Pima County. The plant serves approximately 1,800 residents and businesses in North Marana. Pending the outcome of legal disputes, Marana WRF (one of the eight sub regional facilities) may or may not be an exception to the County's Designated Management Agency.²⁹ As of January 2012, there are ten WRFs – seven that are sub regional.

Figure 5 shows the location of the County's Wastewater Reclamation Facilities and their service areas including Marana.³⁰

Pima County's share of reclaimed water generated at the Regional Wastewater Reclamation Department's facilities is used in a variety of beneficial ways. Most of the irrigation reuse occurs at County parks or at the Kino Environmental Restoration Project (KERP). Figure 6 illustrates the distribution of reclaimed water.³¹

Figure 5: Pima County Wastewater Reclamation Facilities 2010



25. Arizona Pub. Serv. Co. v. Long, 160 Ariz. 429, 773 P.2d 988

26. http://www.azwater.gov/AzDWR/IT/documents/Layperson's_Guide_to_Arizona_Water.pdf

27. http://www.pagnet.org/documents/Water/PC208/ExecSumm_Apr06.pdf

28. Effluent Generation and Utilization Report 2010, Pima County Regional Wastewater Reclamation Department

29. Pima Association of Governments' 208 Plan

30. Pima County Regional Wastewater Department Regional Optimization Master Plan – Final Report, November 2007.

31. http://www.pima.gov/wwm/pubs/pdf/Effluent_gen_2009.pdf

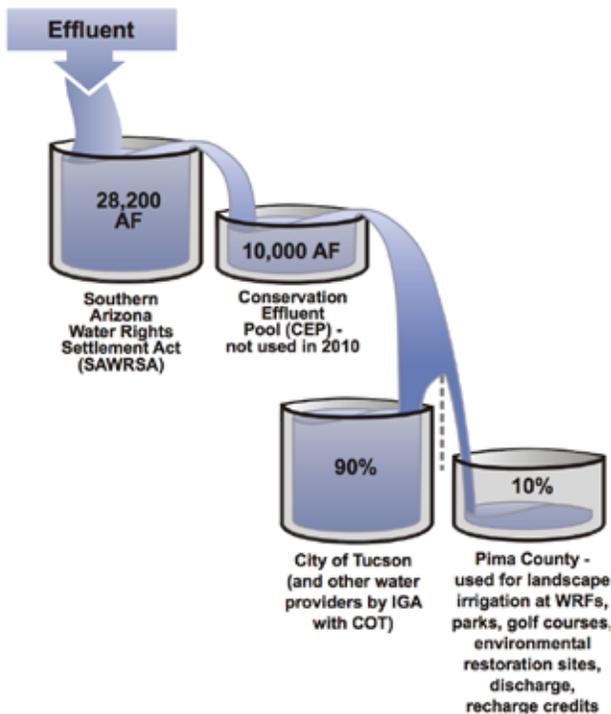
County Share of Reclaimed Water and Reclaimed Water Plan

Reclaimed water generated in the metropolitan area is shared among the City of Tucson (City), the Department of Interior (on behalf of the Tohono O'odham Nation to satisfy the Southern Arizona Water Rights Settlement Act) and Pima County. The City of Tucson has separate agreements with various water providers designating a portion of their reclaimed water. In 2010, the total reclaimed water produced by the three metropolitan WRFs was 64,539 AF. Under various intergovernmental agreements, Pima County has ownership of 10 percent of the reclaimed water remaining after subtracting 28,200 AF of reclaimed water allocated by the Southern Arizona Water Rights Settlement Act (SAWRSA). In 2010, Pima County's share of metropolitan reclaimed water was 3,633.9 AF.³²

Non-metropolitan reclaimed water is generated from the sub-regional facilities operated by RWRD that serve outlying areas of Pima County. These facilities generated 4,280 AF of reclaimed water in 2010. Reclaimed water from these facilities was used as follows:³³

- 261 AF discharged to waters of the State and to support riparian habitat
- 1,741 AF of reclaimed water delivered to other parties
- 2,264 AF to replenish groundwater
- 13 AF used on-site at the sub-regional facilities

Figure 6: Distribution of Reclaimed Water Entitlements



Ownership of reclaimed water from the sub-regional facilities was addressed in a 1979 Intergovernmental Agreement between the City and County and a Supplemental Agreement approved in 2000. The City and County have differing interpretations of ownership that need to be resolved. Resolution of this issue will allow Pima County to make long-term plans for the beneficial use of reclaimed water produced at the sub-regional WRFs.

Policy Initiatives

Phase 2 of the *Water/Wastewater Infrastructure Study*³⁴ (WISP) established a framework for sustainable water resources planning and included 19 goals and recommendations.

Goals related to reclaimed water call for the City and County to maximize and make efficient use of reclaimed water and other locally renewable water supplies, to address regulatory barriers to maximizing local supplies and to foster increased use of reclaimed water.

Implementation of WISP Phase 2 is described in an action plan approved by the City and County. For the County's share of effluent/reclaimed water, applicable implementation activities include:

- Prepare a plan for use of the County's share of effluent water.
- Develop with the City a joint recharge project in the Southeast Area (SHARP).
- Implement the Regional Optimization Master Plan (ROMP) improvements to the County's metropolitan wastewater reclamation facilities.
- Evaluate the feasibility of extending the reclaimed infrastructure to County parks and other facilities where reclaimed water will provide water resource benefits.
- Pursue bond funding for reclaimed water system expansion benefiting public use projects. Cost effective extensions to the reclaimed water system will enable some County parks to convert from groundwater use to renewable reclaimed water.
- Seek flexibility in water quality standards and permitting for riparian enhancement and environmental restoration projects using reclaimed water.

Additionally, County staff is working to further the Water Conservation and Management component of the Sustainable Action Plan for County Operations³⁵ goals through an interdepartmental Sustainability Steering Team. Those goals include:

- Doubling the number of County parks served by reclaimed water by 2018, subject to voter approval of bond funds to extend reclaimed water lines.
- Maximizing County's water resource assets including Groundwater Rights, Surface Water Rights and protection, and use of reclaimed water to sustain and protect the natural environment.

32. http://www.pima.gov/www/pubs/pdf/Effluent_gen_2009.pdf

33. 2010 Effluent Generation and Utilization Report, Pima County Regional Wastewater Reclamation Department, <http://www.pima.gov/www/pubs/>

34. 2010 Effluent Generation and Utilization Report, Pima County Regional Wastewater Reclamation Department, <http://www.pima.gov/www/pubs/>

35. City/County Water & Wastewater Infrastructure, Supply and Planning Study, 2011-2015 Action Plan for Water Sustainability. http://www.tucsonpimawaterstudy.com/AP/AP_sections/AP_Overview.pdf

Environmental Restoration using Reclaimed Water

The City and County established a Conservation Effluent Pool (CEP) under the 2000 Supplemental IGA. Under the agreement 10,000 AF of effluent annually can be used for projects promoting habitat conservation plans or environmental restoration projects jointly approved by the City and County. The terms and conditions that make this water available are established in a procedural (or administrative) agreement between the City and County.

The CEP agreement was approved by the Board of Supervisors in December 2010 and by Tucson's Mayor and Council in January 2011. No CEP water can be used until the administrative procedures identified in the agreement are in place. The CEP administrative procedures will establish the process for considering CEP requests, address how allocations and apportionments will be made, require an accounting of quantities used, address how CEP water will be delivered and scheduled, and require project status reporting. No additional action will be taken until an application for use of effluent from the pool is received.

Pima County uses a share of its reclaimed water for environmental restoration (separate from the CEP) as shown in the table below.

Table 3: Environmental Restoration with Reclaimed Water as of 2010³⁶

Project Name	Volume in Acre Feet (AF)	Multi-benefit Recharge Project?	Description
Kino Environmental Restoration Project (KERP)	14.7	Yes	Reclaimed water was used at the site to support riparian vegetation on ten different days because of dry conditions. Riparian vegetation at KERP is usually supported with harvested stormwater.
Lower Santa Cruz River Managed Recharge Project	116.2	Yes	This volume represents Pima County's share after the total evapotranspiration (ET) from the managed recharge project. The total ET was 1,013.7 AF and this volume is split among the participants in accordance with the allocation formula. See Figure 6 above
Marana WRF Discharge to Riparian Tributary	260.6		Discharge supports wetlands formed in tributary to the Santa Cruz River.
Marana High Plains Effluent Recharge Project	13.8	Yes	Delivery of 427.71 AF was diverted from Santa Cruz River. The calculated evapotranspiration of 13.8 AF is the portion of the delivery volume that supports riparian vegetation.
Rillito Riparian/Swan Wetlands	15.6	Yes	Reclaimed water is being used for the establishment of plants that were installed as part of this ecosystem restoration project.
Roger Road WRF Pond	24.0		This volume is used to support a riparian pond on-site.
Santa Cruz River – West Branch Wetlands	0.7		Reclaimed water used to support a small wetland area managed by PCR/CD.
Annual Total	445.8		

SHARP Joint Reclaimed Recharge Project

The Southeast Houghton Area Recharge Project (SHARP), an action item in the WISP study, will benefit the City and County by storing reclaimed water for recovery at a later date. The objective of the project is to establish one or more joint recharge construction projects, in the southeast area of the County, to store water for replenishment of the aquifer and potential future use. The targeted minimum recharge capacity is 4,000 AF with the County and City each contributing 2,000 AF of reclaimed water.

Two key advantages of this approach for recharge, compared to the managed recharge in the Santa Cruz River, are that the City and County will each receive 100 percent credit for water recharged and that recharging off-channel in constructed basins will eliminate "outflow" losses now experienced downstream of Trico Road. This project also replenishes the aquifer in an area of Pima County that is further up gradient in the groundwater basin and closer to an area where it can be reused.

Strategy and Reclaimed Water Management Plan

A strategy and reclaimed water management plan is needed to identify how the County's share of reclaimed water from both metropolitan area regional facilities and sub-regional facilities will be used and allocated. An ideal strategy is to balance the needs among turf irrigation and other reuse at county facilities, aquifer replenishment and riparian enhancement and protection.

Action Items

1. The County and City need to resolve ownership of reclaimed water from area sub-regional facilities.
2. The County and City will establish administrative procedures and begin implementation of the Conservation Effluent Pool pursuant to the CEP agreement when an application for use of effluent from the pool is received.
3. The County and City should continue to implement the SHARP (Southeast Houghton Area Recharge Project). The IGA for this project sets up a Joint Recharge Oversight Committee (JROC) for siting, permitting, constructing and operating the project.
4. The Water Management Committee should develop a strategy and reclaimed water management plan for its share of reclaimed water from both metropolitan and sub-regional wastewater reclamation facilities. The management plan should address needs for sustainable flows in the Santa Cruz River, replacement of groundwater use with reclaimed water at County facilities, enhancement of riparian areas and replenishment of the aquifer through underground storage of reclaimed water.

Long-Term Storage Credits

Long-Term Storage Credits (LTSC) are earned for water that is stored underground for more than one year and are regulated according to State statutes and ADWR. RWRD is the managing department for these credits. The stored water can be recovered anywhere in the Tucson Active Management Area consistent with a recovery plan that has been submitted and approved by ADWR.

The County accrues credits at various facilities through the recharge of treated reclaimed water. Recharge facilities where Pima County contributes reclaimed water include:

- *Lower Santa Cruz River Managed Recharge Project (LSCRMRP) administered by the Cortaro-Marana Irrigation District for the participants. This facility stores reclaimed water that flows beyond Ina Road in the Santa Cruz River. The discharged reclaimed water infiltrates through the channel bottom between Ina Road and Trico Road. The project began accruing credits in 2003 and has a maximum permitted recharge capacity of 43,000 AF annually.*

The City of Tucson, Pima County, the U.S. Bureau of Reclamation, the Metropolitan Domestic Water Improvement District (Metro Water), the Town of Oro Valley, Spanish Trails Water Company and Flowing Wells Irrigation District are participants in this project. Each has a reclaimed entitlement to the water recharged in the Santa Cruz River and accrues credits at the LSCRMRP. Total potential credits are limited to 21,500 AF annually after the 50 percent cut to the aquifer (SAWARSA agreement).

The number of credits accrued in any given year is based on annual stream-gauging data that measure infiltration rates. Adjustments are made to account for diversions and evapotranspiration losses. A plan for how the storage credits will be used, a wet-water recovery plan, has yet to be agreed upon by the participants.

- *Marana High Plains Effluent Recharge Project (MHPERP) was developed in 2002 by the Pima County Regional Flood Control District in cooperation with the Bureau of Reclamation, Cortaro-*

³⁶ Pima County Regional Wastewater Reclamation Department 2010 Effluent Generation and Usage Report, page 19

Marana Irrigation District, Town of Marana and the Arizona Water Protection Fund. This constructed recharge project is located along the south bank of the Santa Cruz River east of Sanders Road. MHPERP was designed to study the feasibility of recharging treated reclaimed water into the local groundwater aquifer, while simultaneously examining wildlife habitat opportunities associated with recharge facilities.

The two objectives of the project are to:

- recharge up to 600 AF of water per year while determining what infiltration rates can be maintained in basins having side slopes, vegetated with emergent plants and riparian trees
- revegetate the area outside the recharge basins with plants that will improve wildlife habitat value.

The source of the reclaimed water for MHPERP is the Roger Road and Ina Road WRF discharge into the Santa Cruz River. This water flows in the Santa Cruz River about 12 miles from the treatment plant discharge points before reaching a pre-existing berm constructed of streambed materials that diverts a portion of it into the "oxbow" channel. From the diversion, the water flows about one mile down the channel before reaching MHPERP. A 20-year permit was obtained from ADWR that allows for deepening ponds and enhancing recharge to attain the goal of 600 AF/year. In 2009 and 2010, the facility stored an average of 415 AF each year.

- Corona de Tucson Wastewater Reclamation Facility is a sub-regional facility that serves an area southeast of Tucson. It was recently upgraded to treat one million gallons per day. Treated effluent is discharged into three percolation basins designed for groundwater replenishment as a constructed recharge facility. A permit to recharge was received from ADWR in 2009. Long-Term Storage Credits began accruing the second quarter of 2010 and Pima County received 277.6 AF at this site. The facility is currently permitted to store 1,120 AF per year and eventually, when there is sufficient flow to the plant, 2,240 AF per year.

- Sale, lease, trade or exchange as approved by the Board of Supervisors
- Retire credits as a contribution to benefit the aquifer
- Banking for future to-be-determined uses and allowing the value of this water resource to increase

One consideration in recharging reclaimed water to accrue LTSC is how it achieves the goal of safe yield in the AMA. Recharging reclaimed water that leaves the TAMA boundaries as it flows in the Santa Cruz River does not contribute toward safe yield. Additionally, accruing LTSC for reclaimed water that would have remained in the TAMA through passive recharge also does not contribute to the safe yield goal if the storage credits are recovered as groundwater in another part of the TAMA. LTSC do not provide new, renewable water to the TAMA. The objectives of accruing LTSC should be carefully considered.

Table 4 – Summary of Pima County’s Long-Term Storage Credits³⁸

Year	Storage Credits	Cumulative Credits
2003	58.10	58.10
2004	449.30	507.40
2005	535.10	1,042.50
2006	532.30	1,574.80
2007	788.38	2,363.18
2008	1,025.89	3,389.07
2009	977.41	4,366.48
2010	1,085.31	5,451.79

Since the County began accruing Long-Term Storage Credits (LTSC) in 2003, it has accumulated 5,451.79 AF of Long-Term Storage Credits through 2010.

ADWR accounts for Long-Term Storage Credits as prescribed in ARS Title 45-852.01. All recharge permit holders are required to file annual reports with ADWR. LTSC can be recovered for various reasons including establishing an assured water supply or fulfilling replenishment obligations. The recovery must be consistent with the management plan and the goals of the AMA. The stored water can be recovered anywhere in the Tucson Active Management Area consistent with a recovery plan that has been submitted and approved by ADWR using permitted recovery wells.³⁷

Currently, there are no plans in place for recovery or use of Long-Term Storage Credits accrued by the County. One potential application would be to use credits as a buffer for the future. Another is to reserve them until a department has a specific use. For example, a new park located away from a renewable water source could install a groundwater well and recover water stored to irrigate turf. Yet another example could involve the County selling its Long-Term Storage Credits with restrictions on where the water is recovered. Potential uses could include:

- Recovery at County facilities in lieu of pumping groundwater using Groundwater Rights
- Recovery for County use in a location where the County does not have a Groundwater Right
- Recovery for a use that might not be allowed with groundwater (for example to fill a recreational lake)

More LTSC for the County could be generated if more of its reclaimed water could be recharged. However, before pursuing additional recharge, some issues to address are:

- Are there other higher uses of reclaimed water, such as reclaimed water direct reuse for riparian restoration? How might these uses be supported or augmented with LTSC?
- Should the County restrict where its credits are recovered, i.e., such as prohibitions near groundwater dependent ecosystems?
- How should the value of LTSC be determined in considering proposals to sell, lease or exchange LTSC?
- Are there areas in the aquifer where it is not beneficial for the County to recharge its reclaimed water?

Long-Term Storage Credits may have value in a strategic exchange that extends beyond the current monetary worth of the water and may be traded for land, easements or anything else of value. An example of the strategic value of LTSC was seen in a February 2010 exchange between Metro Water and the Central Arizona Water Conservation District (CAWCD). In that case, Metro Water used 12,815 AF accrued LTSC to acquire the Avra Valley Recharge Project. Metro Water’s credits were valued at \$135 per AF. Pima County should evaluate any proposals to sell, lease or exchange its LTSC and ensure any transaction will benefit the County. Ultimately, these decisions should be made by the Board of Supervisors.

37. ARS 45-834.01. Recovery of stored water; recovery well permit; emergency temporary recovery well permit; well construction

38. Effluent Generation and Utilization Report 2010, Pima County Regional Wastewater Reclamation Department, page 20

Action Items

1. *Pima County should include in its reclaimed water management plan a strategy for the use of storage credits that includes a prioritization for their use. It should provide a method of selecting geographic areas where recovery of County-owned water resource assets should be prohibited.*
2. *The Water Management Committee should evaluate any proposals to sell, lease or exchange LTSC and ensure any transaction benefits the County before the proposal is provided to the County Administrator and presented to the Board of Supervisors for their consideration.*
3. *The Water Management Committee should develop a strategy for applying for storage permits for wastewater reclamation facilities that are not yet permitted by ADWR for long-term storage.*
4. *At such time as is required by LSCMRP agreement, a wet-water recovery plan should be agreed upon by the participants and become an action item in the reclaimed water management plan.*

Assisting Other Entities in Obtaining Storage Credits with Their Projects

Pima County has often partnered with other entities to collaborate on regional recharge projects. The Lower Santa Cruz River Managed Recharge Project is an example of such a partnership.

Pima County should assist other entities when there is benefit to the County and its residents. The benefit can be economic, environmental or public (such as environmental restoration or recreation) and must be formally implemented through Board of Supervisors approval.

In the case of the Lower Santa Cruz River Managed Recharge Project, the public benefit is the storage of reclaimed water within the Tucson Active Management Area and the accrual of Long-Term Storage Credits that can be used by the County to the benefit of its residents in the future. Currently, these opportunities are considered on a case-by-case basis.

Action Items

1. *Proposals to obtain Long-Term Storage Credits should include one or more of the following criteria:*
 - *Consistent with County policy, positions and interests*
 - *Inclusion of environmental enhancement features and multi benefit aspects, such as park and recreation use*
 - *Addition of renewable water into the Tucson Active Management Area*
 - *Recovery will result in no adverse water resource impacts to groundwater-dependent ecosystems*

Use of RFCD and/or County Lands for Storage and Recovery by Others

Long-term underground storage of water by others (either CAP or reclaimed water) will eventually be recovered. Under ADWR rules, the entity recovering the water must provide ADWR with a recovery plan that demonstrates others will not be harmed by the recovery. Where water is stored on County or RFCD lands, we may wish to review proposed recovery plans before submittal to ADWR to ensure the County or RFCD's interests will not be adversely impacted by the recovery activities.

State statutes governing the lease of County or RFCD lands require that the lease be established by auction, typically starting at 90 percent of the land's market value. Leases with non-profit organizations or political subdivisions are approved by the Board of Supervisors and can be less than fair market rent. Caretaker agreements do not proceed through the auction process and the market rent is offset by the caretaker responsibilities. Consistent with this practice, the County or RFCD should assess a recharge fee to store water on County or RFCD land. A method for determining that recharge amount should be established.

Action Items

1. *Criteria for the use of County or RFCD lands for recharge purposes should:*
 - *Be consistent with the County's conservation goals and Land Use Policies*
 - *Not be in conflict with Pima County's or RFCD's own interest in recharge*
 - *Have no adverse physical impacts to Pima County's or RFCD's activities and operations*
 - *Have a flood control benefit, if RFCD is participating in the proposed recharge*
 - *Have a compensation component, either a use fee or a dedicated continuing benefit*
 - *Have multi-use benefits*
 - *Have an approved lease agreement or license agreement*
2. *The entity proposing to store water on County or RFCD land should be required to provide a proposed recovery plan for the County's or RFCD's review and approval prior to submission to ADWR for approval.*
3. *The County or RFCD should assess a recharge fee to store water on County or RFCD land. A method to determine the amount should be established.*

Policies on the Use of Reclaimed Water

Pima County has adopted policies that address components of how water resources will be managed. The Sustainable Action Plan for County Operations, in particular, includes a Water Management and Conservation goal to maximize County water resource assets to sustain and protect the natural environment.

The Sonoran Desert Conservation Plan (SDCP) established a Science Technical Advisory Team (STAT) in 2000 that adopted goal statements for the SDCP. With respect to water resources, the STAT adopted the following goals:

1. *Maintain or restore the connection between interdependent components of river systems: channel, overbank floodplain, distributary flow zones, riparian vegetation and connected shallow groundwater.*
2. *Maintain or restore natural flooding and sediment balance*
3. *Preserve or re-establish connection between channels and their floodplains, and channels and their distributary flow zones*
4. *Maintain or re-establish hydrologic connections between riparian and aquatic ecosystems and shallow groundwater zones*
5. *Ensure sufficient in-stream flows to achieve and protect natural functions of riparian and aquatic ecosystems*

Various modes of delivery or discharge for the reclaimed water from metropolitan and sub-regional water reclamation facilities exist. In 2010, just over 20 percent of all the metropolitan area reclaimed water was treated and delivered to the City's reclaimed water system, but the largest portion, 79 percent, was discharged

to the Santa Cruz River. About 37 percent of the reclaimed water discharged replenished the aquifer and accrued Long-Term Storage Credits. The remaining reclaimed water was reused on site at the WRFs.

Over many years, a riparian habitat dependent on reclaimed water has established itself along the Santa Cruz River in Pima County. Reclaimed water that sustains this riparian habitat constitutes in-stream flow that should be maintained. However, the amount of reclaimed water that must be committed to this objective has not been identified. A river management plan for the Santa Cruz River could identify the level of water resources required to sustain riparian habitat and provide for multiple environmental and recreational uses.

Pima County's share of reclaimed water that is used for County facilities is treated at the Randolph Park WRF and delivered in the City's reclaimed system. The Randolph Park WRF has ADEQ permits to produce Class A reclaimed water that meets the existing requirements of Tucson Water's Reclaimed Water System. A significant feature of the Randolph Park WRF is that it is considered a "scalping" plant – RWRD can control the reclaimed water production by limiting influent taken from the sewer collection system. Any remaining influent flows to Roger Road WRF for treatment.

Reclaimed water from the Randolph plant is delivered directly into Tucson Water's Reclaimed Water System, per the 2000 Supplemental IGA and the subsequent Wheeling IGA. Under the 2000 Supplemental IGA, Pima County agreed to restore the Randolph Park WRF and to deliver to the City an average of 1,000 AF of reclaimed water annually during an initial delivery period. The balance of the reclaimed water produced may be put to public use by the County.

Reclaimed water is generated from the sub-regional wastewater reclamation facilities that serve the outlying areas of Pima County. Expansions to the sub-regional wastewater reclamation facilities will produce additional reclaimed water that should be put to beneficial uses. Therefore, long range wastewater reclamation facility planning should include a component for the use of reclaimed water to be produced. The wastewater reclamation facility planning effort should include departments that use reclaimed water, such as NRPR, RFCD and other turf users. Planning should incorporate multi-use, multi-benefit projects.

A reclaimed water management plan for Pima County's metropolitan reclaimed water is needed to address and prioritize uses of reclaimed water among reuse, environmental enhancement and aquifer storage. The reclaimed water management plan should also address effluent produced by the sub-regional plants.

Action Items

1. *Pima County should retain its reclaimed water in the region through groundwater replenishment and should secure Long-Term Storage Credits in conjunction with the objectives of reuse, environmental enhancement and preserving value of its water resource assets.*
2. *A river management plan for the Santa Cruz River should be developed to identify the level of water resources needed to sustain riparian habitat and provide for multiple environmental and recreational uses.*
3. *Reuse planning should be incorporated into Wastewater Reclamation Facility expansion plans with participation of County departments that use or could potentially use reclaimed water. The plan should identify opportunities for multi-use, multi-benefit projects.*

Intradepartmental Management of Water Resources

Water rights, reclaimed water and Long-Term Storage Credits are considered an asset of Pima County. Since some County departments own or generate water resources, while other County departments use water resources, there is a need to coordinate availability and demand among departments.

The Regional Wastewater Reclamation Department treats and produces reclaimed water that is used by the Natural Resources, Parks and Recreation Department to irrigate turf on regional parks, and the Regional Flood Control District uses reclaimed water to sustain riparian vegetation at environmental restoration projects such as Swan Wetlands.

Pima County harvests stormwater at KERF to irrigate turf for the Stadium District and to sustain riparian habitat using Surface Water Rights owned and managed by RFCD. These are examples of successful interdepartmental collaboration where Pima County's water assets are put to beneficial uses.

Under the 2003 Wheeling Agreement, the County's 2010 rate for County reclaimed water wheeled (delivered) through the City of Tucson's reclaimed water system was \$71.33³⁹ per AF. The amount of reclaimed water available to the County at the 2010 Wheeling Rate is limited to the amount of reclaimed water produced at the Randolph WRF minus 1,000 AF allotted to the City until the year 2031. After that, the County's obligation to the City is reduced to 740 AF annually.

The County may use more than this prescribed volume of wheeled reclaimed water from the City's Reclaimed System, but will pay for it at the higher, interruptible Environmental Rate of \$270.25 per AF. These rates are recalculated annually in accordance with the Wheeling Agreement.

Reclaimed water demand changes seasonally and with annual weather patterns. It may also vary in response to climate change. Furthermore, the County has a sustainability goal to use renewable water such as reclaimed water, where feasible, for all new projects with landscape needs. As reclaimed water demand increases, planning for reclaimed water use from the County's share of reclaimed water will become more important.

Increased collaboration is needed to coordinate demand and reclaimed water production. If Randolph Park WRF produces more reclaimed water than is needed, then RWRD incurs greater treatment expenses than is necessary. Alternatively, insufficient production of reclaimed water means County departments using reclaimed water must pay Tucson's costlier Environmental Rate (nearly \$200 more per AF).

Increased collaboration with other entities that have a reclaimed water share is also possible. Collaborative opportunities may exist in sharing infrastructure costs and shared delivery costs to extend the reclaimed system to multiple users and increase the amount of reclaimed water used on parks, private golf courses, schools and recreational turf, such as soccer fields.

Periodic comparison of reclaimed production and use along with forecasting the amount of reclaimed water required by County departments would assist in decisions about how to adjust WRF operations or irrigation practices to match reclaimed water production and demand. There are two periods in the year when this information would be particularly useful:

1. *In the spring, when County departments must confirm with Tucson Water their locations for wheeling use on the reclaimed system. A projection of the amount of reclaimed demand for each location should also be determined and new sites identified*

39. Effective July 5, 2010. Reclaimed Water Cost of Service: Update of Reclaimed Rates in the 2000 Supplemental IGA/2003 Wheeling Reclaimed Water IGA, June 19, 2010, Chris Avery, City of Tucson

and added to the Wheeling Agreement. Departments that are using County reclaimed water delivered through Tucson's reclaimed water system are Natural Resources, Parks and Recreation, the Regional Flood Control District, the Stadium District and the Department of Transportation. A regular review of the county sites that are receiving reclaimed water should be completed and reviewed with Tucson Water. The review should also include County departments, meter numbers and account numbers to ensure the appropriate department is being billed.

2. A summary of reclaimed water use along with projections through the end of the year should be prepared near the end of August when the summer irrigation season is nearly done. At the same time, current production figures from Randolph WRF and projected O&M aspects of the operation should be used to determine the likely effluent production target for the next year.

Item 1 above describes a planning point that can be used to determine whether reclaimed water demand is expected to be higher or lower than the previous year.

Item 2 describes a point when all affected departments can compare eight months of actual data to arrive at a mutual agreement whether to stay the course, cut back on irrigation, boost reclaimed water production or pay increased rates for reclaimed water from Tucson Water.

Other alternatives might be evaluated at that time as well. The Effluent Generation and Utilization Report, produced yearly by RWRD, includes monthly use of reclaimed water by NRPR, DOT, Stadium District and RFCD. This report can be used as a starting point adjusted to include new County facilities added to the reclaimed system and climate impacts such as precipitation and temperature.

Pima County's share of reclaimed water is delivered via the City of Tucson's reclaimed water system to approximately 40 County reuse sites. Pima County should maintain an inventory of these sites that includes data on the amount of reclaimed water use, meter number assigned, responsible department, rate charged by Tucson Water, customer account number and water user agreement. This inventory would help Pima County plan for its use of reclaimed water. It can also be used to ensure Pima County is receiving the appropriate rate, which will help departments with their financial budgeting and ensure the appropriate department is being billed. An accurate inventory of County reclaimed water sites would also be used to update Appendix A, which is the list of County sites eligible to receive reclaimed water.

Another planning element would consider the benefits of direct reuse from the WRFs without wheeling it through the City's reclaimed system. Eight of the County's WRFs are permitted for direct delivery of reclaimed water. The advantage of direct reuse from the WRFs is that the County does not incur a charge from Tucson Water. Examples include delivering reclaimed water directly from Ina Road WRF to Sports Park or direct delivery from the new Water Campus facility to proposed adjacent sports fields.

In 2010, on-site use of reclaimed water at the County's metropolitan WRFs was about 120 AF. An additional 2,264 AF each year was delivered to recharge projects where the County accrued some Long-Term Storage Credits. Pima County also used 460 AF of reclaimed water from both metropolitan and sub-regional reclaimed water to sustain environmental restoration activities.

More than 1,000 AF per year of Pima County's reclaimed water leaves the Lower Santa Cruz River Managed Recharge Project and ultimately the Tucson Active Management Area. As the County's

use of reclaimed water increases, a decision-making process to allocate the remaining share of the County's reclaimed water among turf irrigation and other reuse, environmental restoration, aquifer replenishment and long-term storage should be developed.

Action Items

1. Using a utility software program, develop a monthly tracking process for the reclaimed water used by various County departments
2. Continue the seasonal process planning process (springtime) to assist in planning reclaimed water production at Randolph Park WRF and to identify new locations for wheeled reclaimed water. An additional decision point (at the end of the monsoon season) exists for evaluating current use and production data, projection of use and production, and any other factors to arrive at adjustments that need to be made to satisfy an imbalance in reclaimed water availability and demand.
3. Update on an annual basis the inventory of County reclaimed water sites including water use data, responsible department meter number, customer account number, water user agreement and rate charged by Tucson Water.
4. Annually update Appendix A of the 2003 Wheeling Agreement to include new sites that are eligible for the operating reclaimed water rate.
5. Where possible, deliver reclaimed water directly from the WRFs and bypass the City's reclaimed system (Sports Park at Ina Road WRF or the new Water Campus facility, for example).
6. Through the Water Management Committee, Pima County's Water Rights Team should recommend that opportunities to use reclaimed water on multi-use, public benefit projects are maximized when reclaimed water extensions are planned.

Procedures for Water Resources Management with External Entities

Pima County has policies and procedures for the disposition of both real property and personal property. Administrative Procedure No. 54-2 describes the process for the acquisition, exchange and sale of County property as well as condemnation actions. Board Policy D29.11 addresses the disposition of surplus personal property. These policies and procedures specify that only the Board of Supervisors can approve the sale, exchange or lease of County-owned or RFCD-owned assets including water rights and reclaimed water.

For example, the Board approved the sale of reclaimed water from the Green Valley WRF to Robson Quail Creek for recharge and reuse. The agreement provided for an in-kind contribution toward the construction of filtration facilities and a reclaimed water charge of \$40 per acre-foot. Robson recharges reclaimed water from the WRF and recovers it for irrigation of their golf course. In the future, the County may see other similar opportunities for sale of reclaimed water from sub-regional facilities.

As a participant in the Lower Santa Cruz River Managed Recharge Project, RWRD recharges reclaimed water in the Santa Cruz River to generate Long-Term Storage Credits (LTSC) that can be recovered within the Tucson Active Management Area. Pima County also recharges reclaimed water at the Marana High Plains Effluent Recharge Project and the Corona de Tucson WRF to generate LTSC. From time to time, proposals have been advanced to purchase the County's credits. A formal process to evaluate proposals relating to county water assets is needed. Additionally, there is no formal plan regarding the accrual of LTSC and how they will be used in the future.

A policy consideration should include a provision that allows for County departments and/or RFCD to have priority in the use of water rights before they are sold, traded, exchanged or otherwise relinquished to others.

Action Items

1. A formal process to evaluate proposals relating to County water assets is needed.
2. A plan regarding the accrual of LTSC and how the credits will be used in the future is needed.
3. A process is needed to evaluate proposals regarding the use of water rights, reclaimed water and Long-Term Storage Credits.
4. Regarding the use of County water assets:
 - Internal users (other County departments and/or RFCD) should get priority.
 - Conditions should be established under which the County sells water assets (such as environmental, financial or benefit to the public).
 - There may be conditions under which Pima County would convey County property without including water rights and these should be formalized.

State Legislation or Regulatory Changes

The Board of Supervisors annually adopts a legislative agenda that identifies the statutory changes it wishes to pursue or support during the State's Legislative Session. Departments do not independently promote or pursue legislation, so legislative proposals must have the Board's approval and advance through the County's legislative liaison.

There are several legislative or regulatory changes that should be considered. Among these items:

- Support efforts to amend the Long-Term Storage statutes ARS §§ 45-811.01 & 45-852.01C.1 to allow the Bureau of Reclamation to earn a one-for-one Long-Term Storage Credit for reclaimed water recharged in the Santa Cruz River. Doing so would provide an incentive to retain water in the TAMA and sustain riparian habitat (elimination of 50% cut to the aquifer for SAWRSA).
- Notification of newly drilled, non-exempt wells requiring evaluation of potential impacts to County/RFCD-owned lands.
- In-lieu credit for conversion of turf irrigation or landscape irrigation from groundwater to reclaimed water.
- Regulatory changes that encourage rain and stormwater harvesting.



CONCLUSION

Pima County and the County's Regional Flood Control District have complex and diverse water resource assets that should be managed wisely. As a region, we should be thinking about the future with regards to water, especially reclaimed water, as an extremely important asset to be managed. The 21st century will bring challenges, not only to Arizona and Pima County in particular, but to the world in general. Of the challenges we will face, water will be a top priority.

In the Introduction and Purpose of this report, there are thirteen recommendations that the Board of Supervisors and the County Administrator are encouraged to adopt and fund.

With the guidance of the Water Management Committee, recommendations on the management of water resources assets should be researched and assessed by WMC's working group, the Water Rights Team.

The Water Rights Team meets bimonthly to discuss the latest water resources inventory, discrepancies with Arizona Department of Water Resources, pending issues and recommend policy and/or procedures. The Water Rights Team should develop operating procedures to protect water assets and environmentally valuable features through policies/procedures before irreversible damage occurs.

Decisions on uses for Pima County's water resources should be studied and vetted through the Water Rights Team and proposals passed through the Water Management Committee to the County Administrator for action. Among some of the water rights issues to be decided upon are:

- *The best use of groundwater rights that benefit Pima County and its residents*
- *Protection of groundwater-dependent ecosystems*
- *Appraising the future worth of unused Groundwater Rights before these rights are used, sold or leased*
- *Evaluation of the County's water consumption and water sources including water purchased from the region's water providers*
- *Identify the most cost effective and best use of water and water resources*
- *Ownership of reclaimed water from sub-regional area wastewater reclamation facilities remains unresolved*
- *Strategic planning for the use of the County's share of reclaimed water*
- *Sustaining flows in the Santa Cruz River*
- *Replacing groundwater use*
- *Restoring riparian areas*
- *Replenishing the aquifer*
- *Planning for the use of rainwater and stormwater – additional water assets the County and RFCD manage*
- *Tactics for the use of Long-Term Storage Credits – a wet-water recovery plan*

The Water Rights Team feels the addition of the Water Resources Asset Database (WRAD) will aid all participatory departments enormously. It will assist in the much needed groundwater well condition assessment, track inconsistencies with ADWR's Statements of Claimants, aid in State-mandated reporting requirements, document and monitor the use of Surface Water Rights, Groundwater Rights, reclaimed water and Long-Term Storage Credits as well as assist in the Gila River Adjudication and other purposes.

Arizona is in its second decade of what some experts are predicting may be a 30-year drought. Drought and climate variability are predicted to impact our part of the world in many different ways including the vulnerability of Pima County's economic and social sectors. Pima County's Drought Management Plan and the Local Drought Impact Group (LDIG) are important components in the water resources portfolio through its efforts to educate, identify drought impacts, recommend response actions and monitor drought and climate variability effects in southern Arizona.

A strong legislative agenda identifying issues important to Pima County should continually be developed and advocated. Pima County and southern Arizona have water asset-related issues that do not occur in other parts of the state. For example, this area, with the exception of Cienega Creek, has no natural perennial surface water sources. Consequently, we must rely on renewable sources of water or groundwater.

Next Steps

This document has been in the works for more than a year and strives to be a guide for policy/decision makers. A tremendous amount of research went into the presentation of this material. Many facts and figures have been displayed and conversely, for the sake of readability, many facts have been left out.

The next step is for the Water Management Committee to produce a thoughtful, comprehensive strategic plan document taking into account all the recommendations listed here to best use the County's and RFCD's varied water assets.

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District 1 - Ann Day

District 3 - Sharon Bronson

District 4 - Raymond Carroll

District 5 - Richard Elías

County Administrator

C. H. Huckelberry



PIMA COUNTY, ARIZONA BOARD OF SUPERVISORS POLICY

Subject:

Water Rights Acquisition, Protection and Management

**Policy
Number**

F 54.9

Page

1 of 1

PURPOSE: The purpose of this policy is to set forth conditions under which Pima County and the various County Departments will manage County owned or acquired water resources including surface water, groundwater, effluent, reclaimed water, recharge water and water storage credits.

BACKGROUND: In its ordinary course of business, the County has acquired and regularly acquires various water resource assets, along with any associated water rights, and generates reusable effluent or reclaimed water and related recharge credits. These assets become public property and are managed by the County for the public interest and welfare in the same manner as other public assets under County management. The County recognizes and hereby affirms that these various water resources including surface water, groundwater, effluent, reclaimed water, recharged water, rainfall runoff, other water resources and any related water rights and storage or use credits, are valuable public assets. The Board of Supervisors establishes this policy to insure that said water resource assets are properly managed and preserved for the public benefit. This policy does not apply to potable water purchased from water providers.

POLICY: It is the policy of Pima County to buy, sell, lease, exchange, use, improve, operate, manage and maintain County owned and acquired ground and surface water, wastewater, reclaimed water, stormwater, recovered water and associated rights and credits that inure to the benefit of the citizens of Pima County. The County proposes to manage, operate and maintain those resources, rights and credits in conjunction with other County facilities. These assets will be accurately monitored by creating and maintaining an inventory and management database of all County water and wastewater assets including effluent recharge credits and other County or Pima County Regional Flood Control District owned or acquired water resources. These water resources will be assigned to identified County Departments or the Pima County Regional Flood Control District for their use and management. These assigned entities will report changes in the status of these waters and annually report their utilization of these water resources. An annual accounting of these resources will be prepared for the County Administrator and Board of Supervisors.

The manner in which these water resource assets will be procured, managed, maintained, shared, delivered, apportioned, sold or exchanged shall be conducted in accordance with procedures established by the County Administrator. A Water Management Committee will be established which consists of staff from County Departments and the Pima County Regional Flood Control District. This committee will develop and propose a management and utilization plan for all County water resources and will recommend assignment of various water resource management functions to specific County organizational units. Additionally, this committee will advise and assist in the implementation of this policy and procedures established pursuant to this policy.

RESPONSIBLE DEPARTMENTS: Real Property Services; Pima County Wastewater Management Department, Natural Resources, Parks and Recreation; Facilities Management; Pima County Regional Flood Control District; Pima County Department of Transportation.

Effective Date: July 24, 2007