MEMORANDUM

Date: September 20, 2013

To: The Honorable Chairman and Members
Pima County Board of Supervisors

From: C.H. Huckelberry
County Administrator

Re: **Effluent Generation and Utilization Report for Calendar Year 2012**

In Calendar year 2012, the Pima County Regional Wastewater Reclamation Department (RWRD) turned 65,386 acre feet of sewage into reusable water – the equivalent of 21.3 billion gallons of water.

The primary purpose of wastewater treatment is to protect the public health by preventing water-borne diseases, such as cholera, dysentery and Hepatitis A and E. An evolving and nearly as important purpose is to provide for beneficial water supply as a renewable resource. The average cost per acre foot to turn sewage into reusable water is defined by the annual budget divided by water produced. For Fiscal Year 2012/13, $165 million divided by roughly 65,000 acre feet yields an approximate cost of $2,538 per acre foot. (The $165.6 million budget represents cash and depreciation/debt service). Given the total budget includes debt service and depreciation and using the operating cost of $75.5 million, the cost is reduced to 1,162 per acre foot.

Based on the intergovernmental agreement with the City of Tucson, Tucson Water is the largest beneficiary of County-produced effluent or reclaimed water. After satisfying federal Southern Arizona Water Rights Settlement Act obligations, the City receives 90 percent of the effluent reclaimed water produced at the metropolitan plants.

The City takes delivery of approximately 12,351 acre feet of reclaimed water, or 18.9 percent of the available reclaimed water, and transports it for use in the reclaimed water distribution system. The balance of the effluent, 48,878 acre feet (or 75 percent), is discharged into the Santa Cruz River. Most importantly, 29 percent of the total effluent produced is estimated to escape the Tucson Active Management Area (TAMA) and flow out of the region at Trico Road. This resource is forever lost to the region. In the future, this loss to the TAMA needs to be significantly reduced. This is one of the reasons the County is developing the Tres Ríos Corazón project; to significantly increase recharge capacity within the region near Sunset Road and Interstate 10. Aside from retaining more water in the TAMA, this will allow us to receive full credit for our efforts. While the region only receives half credit for discharging into a river, full credit is received for recharge into a constructed recharge facility.

Reclaimed water is the only renewable water source available to the TAMA, and its reuse is possible because of the County's continuing investment in wastewater services turning sewage into reusable water. The attached effluent generation and utilization report provides a great deal of additional information regarding effluent production by Pima County and the use of same throughout the TAMA.

Based on our 10 percent, the County's allocation of effluent is 3,319.3 acre feet. The County made direct use of 2,187 acre feet (or 66 percent) in 2012 as irrigation in County parks, the Kino Environmental Restoration Project or at County recharge facilities.

CHH/mjk

Attachment

c: John Bernal, Deputy County Administrator for Public Works
Jackson Jenkins, Director, Regional Wastewater Reclamation

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Jackson Jenkins
Director

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September 6, 2013

To: C. H. Huckelberry, County Administrator

From: Jeff Prevatt, Program Manager
Compliance & Regulatory Affairs Office

Subject: **PIMA COUNTY RWRD'S EFFLUENT GENERATION AND UTILIZATION REPORT FOR 2012**

Enclosed is a copy of Pima County Regional Wastewater Reclamation Department's report regarding Effluent Generation and Utilization covering calendar year 2012. This report documents the production of effluent/reclaimed water from County wastewater reclamation facilities during the year. It also accounts for effluent/reclaimed water use by the County and by others who have a role in utilizing this resource.

This year's report is the second year in which we have included a table summarizing effluent production and use for the Tucson AMA. This information presents a broader picture of how this region relies upon effluent/reclaimed water as a vital water resource.

RWRD will make this report available on its website at http://www.pima.gov/wwm/pubs/ where you will also find other past reports dating back to 2003. For additional information, please contact Jim DuBois at james.dubois@wwm.pima.gov or (520) 724-6009.

FJP:klb
Attachments

Pima County Regional Wastewater Reclamation Department

EFFLUENT GENERATION AND UTILIZATION REPORT 2012

TABLE OF CONTENTS

I. Executive Summary 1

II. Benefits of Effluent/Reclaimed Water as a Resource 4

III. Effluent Generated at Regional and Sub-Regional Wastewater Reclamation Facilities 5

A. Metropolitan Facilities **5**

1. Ina Road Water Wastewater Reclamation Facility 5
2. Roger Road Wastewater Reclamation Facility 6
3. Randolph Park Wastewater Reclamation Facility 6
4. Metropolitan Facilities Summary Table 7
5. Metropolitan Facilities Historical Data 8
6. Metropolitan Facilities Map 9

B. Non-Metropolitan Sub-Regional Facilities 10

1. Arivaca Junction Wastewater Reclamation Facility 10
2. Avra Valley Wastewater Reclamation Facility 10
3. Corona de Tucson Wastewater Reclamation Facility 11
4. Green Valley Wastewater Reclamation Facility 12
5. Mt. Lemmon Wastewater Reclamation Facility 12
6. Pima County Fairgrounds Wastewater Reclamation Facility 13
7. Rillito Vista Wastewater Reclamation Facility 13
8. Sub-Regional Facilities Summary 14
9. Summary Table of All Facilities 15
10. Non-Metropolitan Facilities Map 16

IV. Reclaimed Water for Reuse, Environmental Restoration and Underground Storage (Groundwater Recharge) 17

A. Reclaimed Water Wheeled Through Tucson Water Reclaimed System 17
B. Environmental Restoration with Reclaimed Water 19
C. Underground Storage (Groundwater Recharge) of Effluent 20
D. Summary of Use or Distribution of Pima County's Metropolitan Effluent Allotment 21

V. Effluent Entitlements 22

A. 1979 Intergovernmental Agreement, Resolution No. 1979 - 78 23
B. Southern Arizona Water Rights Settlement Act (SAWRSA) 23
C. City of Tucson - Pima County Supplemental Intergovernmental Agreement Relating to Effluent, Resolution No. 2000-28 23
D. Conservation Effluent Pool Agreement 23
E. Intergovernmental Agreement between the COT and PC for Treating Effluent and Wheeling Reclaimed Water (Wheeling Agreement), Resolution No. 2003-286 24
F. Intergovernmental Agreement-Permitting and Operating Managed In-Channel Recharge of Effluent in the Santa Cruz River Channel (Managed Recharge IGA 2003) 24

VI. Effluent Generation and Use in the Tucson Active Management Area (TAMA) 25

VII. Glossary of Terms & Acronyms 27

I. Executive Summary

The Pima County Regional Wastewater Reclamation Department (RWRD) is dedicated to the goal of protecting public health and the environment in a sustainable manner for the benefit of our current citizens and future generations. RWRD meets this commitment through the significant usage of reclaimed water for groundwater recharge, reuse, and environmental restoration throughout the community. Our activities in this regard aid in mitigating demand on potable water systems, thereby sustaining groundwater levels and preserving green infrastructure throughout our community.

During 2012, RWRD operated 10 treatment facilities, and this report provides a narrative description of the different wastewater treatment processes used at each facility along with the quantity of wastewater received and the amount of effluent produced. During calendar year 2012, RWRD facilities treated wastewater to produce a total of 65,386 acre-feet (AF) of effluent. Figure 1 shows the contributions to total effluent generation in 2012 by RWRD facilities. Ina Road Wastewater Reclamation Facility (WRF), Roger Road WRF and Randolph Park WRF represent the metropolitan facilities identified by the 1979 Intergovernmental Agreement (IGA) between the City of Tucson (COT) and Pima County (PC). Metropolitan facilities generated the majority of effluent with total production at 61,393 AF. Non-metropolitan, sub-regional facilities produced the remaining portion, totaling 3,993 AF.

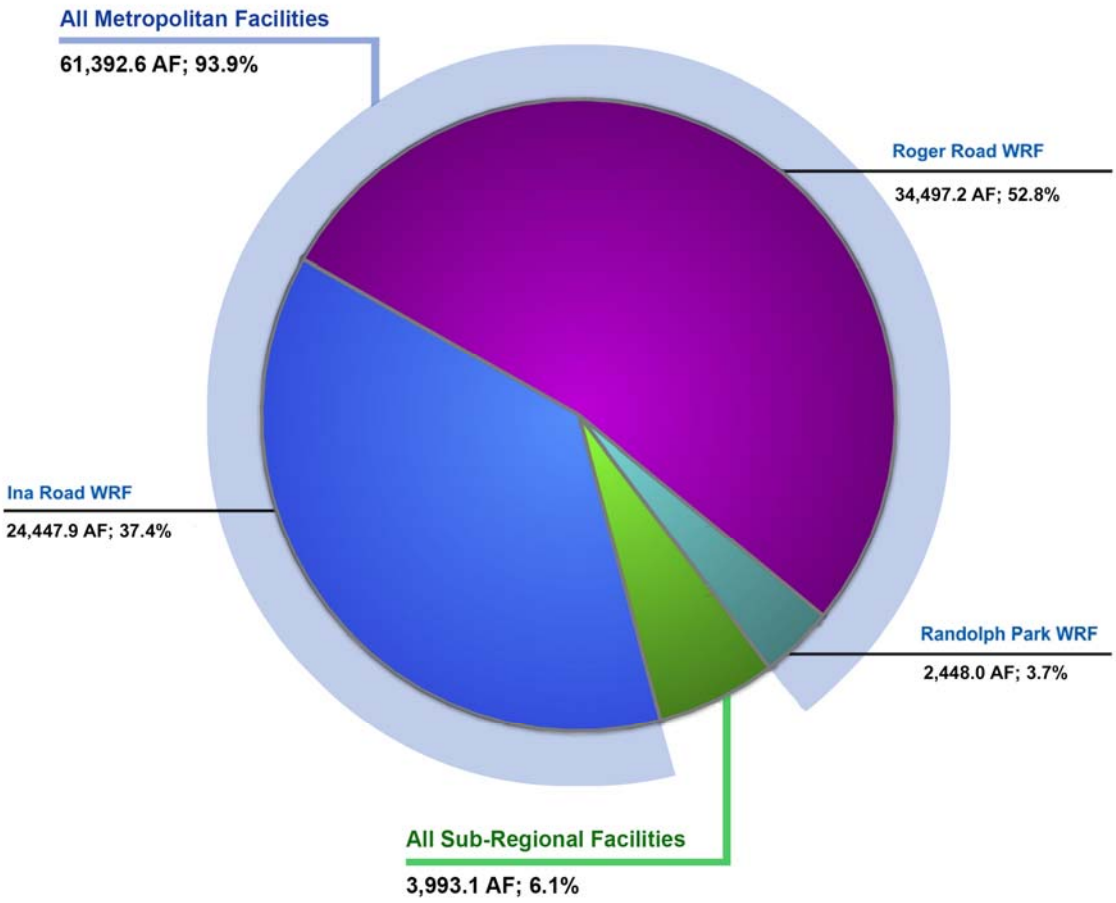


Figure 1: Production of Effluent by Pima County RWRD Facilities for 2012

I. Executive Summary (Continued)

Figure 2 illustrates the various modes of delivery or discharge for the total metropolitan and non-metropolitan effluent. RWRD delivered an appreciable portion of the total effluent volume, consisting of 12,352 AF or nearly 19%, to the City of Tucson's Reclaimed Water System. In addition, direct delivery of reclaimed water by RWRD to other parties accounted for 1,400 AF. Reuse for landscape, construction, or dust control at WRF sites utilized 163 AF. Direct discharge to groundwater using various means, such as percolation beds and recharge basins, accounted for 2,593 AF. The balance of effluent, or 48,878 AF, was released through surface water discharge under the authorization of Arizona Pollution Discharge Elimination System (AZPDES) permits.

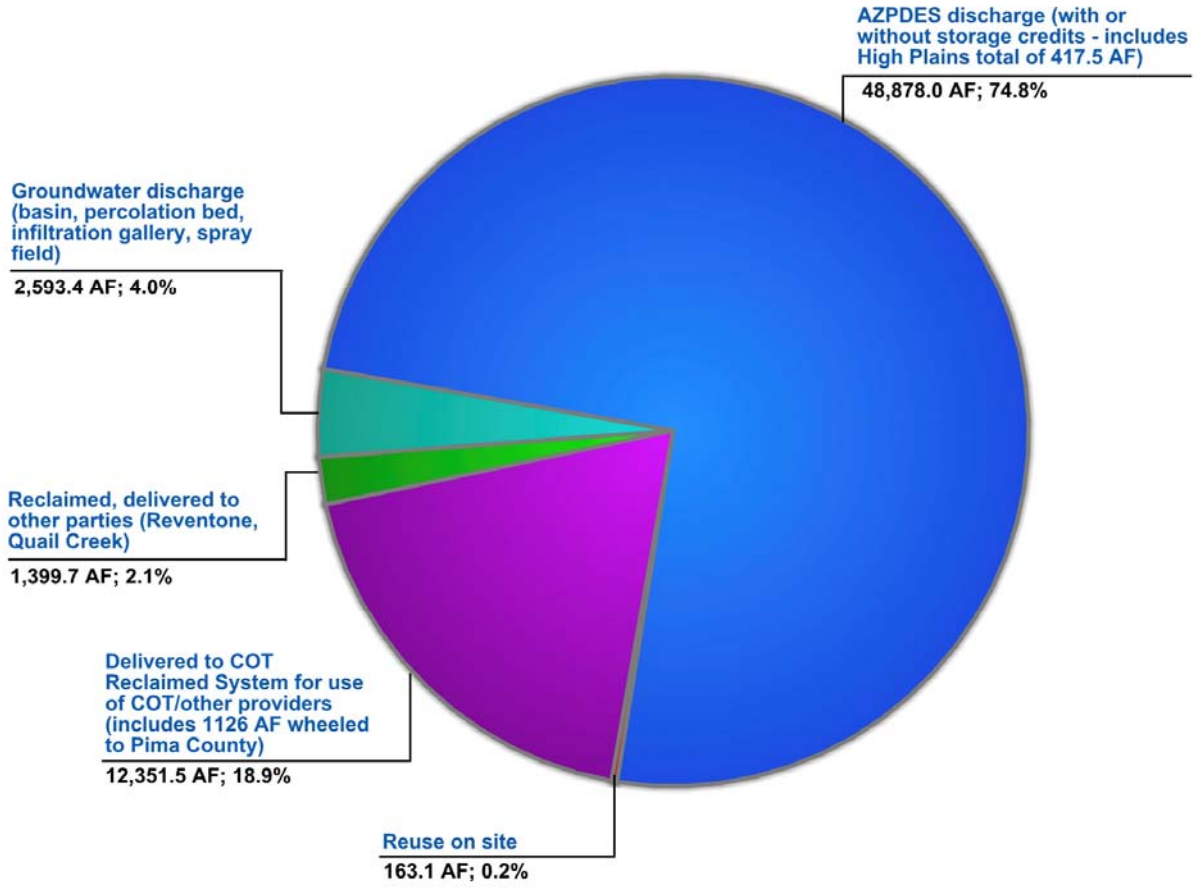


Figure 2: Effluent from All Pima County RWRD Facilities by Type of Discharge, Delivery, or Use for 2012

The 1979 IGA and subsequent agreements govern effluent entitlement from the metropolitan facilities, and this report describes how Pima County's share of the effluent entitlement was used. In 2012, the effluent allocation formula designated the fixed amount of 28,200 AF for the Bureau of Reclamation to manage under Southern Arizona Water Rights Settlement Act (SAWRSA). Of the remaining portion, 29,873 AF were accorded to the City of Tucson and other water providers, while Pima County retained 3,319 AF.

I. Executive Summary (Continued)

Figure 3 shows the manner in which Pima County's share of metropolitan effluent was distributed in 2012. Reuse either on-site at the WRFs or wheeled through the Reclaimed Water System, accounted for approximately 37% of the total. RWRD used 44% of its metropolitan effluent to serve as water delivery to underground storage facilities recharging the aquifer. Pima County's portion of the outflow from the storage reach on the Santa Cruz River comprised 635 AF, making up 19% of Pima County's total metropolitan effluent allocation.

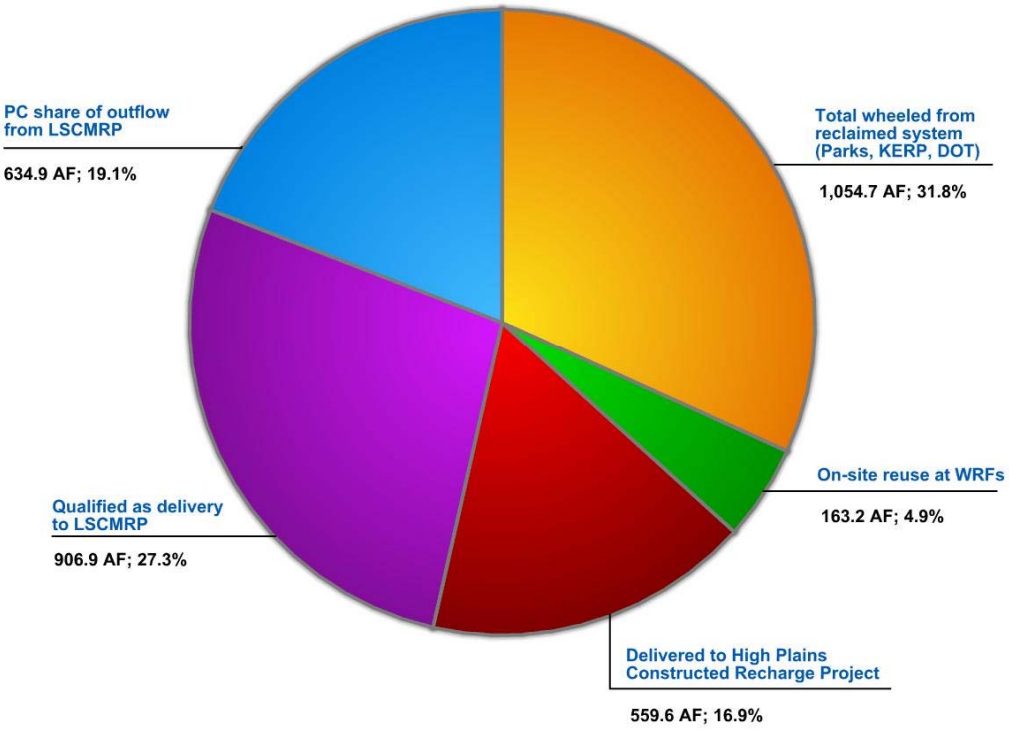


Figure 3: Distribution of Pima County's Share of Metropolitan Effluent in 2012

As a result of groundwater recharge project activities in 2012, Pima County will receive credit to its long-term storage account for 1,131.8 AF of effluent. This volume includes 320.5 AF of underground storage credits for its share of effluent discharged into the Lower Santa Cruz Managed Recharge Project and 542.2 AF for effluent diverted off-channel into the High Plains Effluent Recharge Project. Pima County received an additional 269.1 AF of underground storage credits for its non-metropolitan effluent recharged at the Corona de Tucson WRF.

II. Benefits of Effluent/Reclaimed Water as a Resource

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 regarded by a growing number of people as "recycled water" but is also sometimes referred to simply 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 local governments do not "own" the effluent, but have the right to put it to a beneficial use. Wastewater, treated to suitable reuse standards established by ADEQ, makes up a growing and increasingly important portion of Arizona's water supply.

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 effluent/reclaimed water in eastern Pima County.

Effluent/reclaimed water is generally used for three purposes:

- direct reuse
- environmental enhancement
- aquifer replenishment

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. Using reclaimed water instead of potable supply for these purposes preserves our groundwater for the future. An additional use of the County's effluent/reclaimed water entitlement is long-term storage in underground storage (recharge) facilities. In this manner, reclaimed water is "banked" for future use and serves to replenish the aquifer until it is recovered.

III. Effluent Generated at Regional and Sub-Regional Wastewater Reclamation Facilities

A. Metropolitan Facilities

1. Ina Road Water Wastewater Reclamation Facility

The Ina Road WRF, RWRD's largest facility, is located in the northwestern part of the Tucson basin and serves Oro Valley, Marana and the northwest portions of Tucson. The original facility was constructed in 1979 as a 25 Million Gallons per Day (MGD), Class B, high-purity oxygen activated sludge process. Capacity at this facility was increased in 2006 with the addition of a 12.5 MGD, Biological Nutrient Removal Activated Sludge process producing Class B+ effluent, thereby increasing the overall combined plant capacity to 37.5 MGD. In 2010, ADEQ re-rated the Biological Nutrient Removal (BNR) capacity to 18.0 MGD, and the Aquifer Protection Permit (APP) now reflects a total capacity of 43 MGD. A new plant interconnect pipeline between Roger Road and Ina Road allows sewage flow to be diverted to the Ina Road Facility. During 2012, both the Ina Road East Plant and West Plant were alternately shut down and replaced with new 5-stage Bardenpho process equipment for nutrient removal. This facility uses chlorination to disinfect and dechlorinates prior to discharge.

The Ina Road facility discharges into the Santa Cruz River under authorization of an AZPDES permit. On-site irrigation and dust control occurs in accordance with a Type II Reuse general permit. Effluent discharged into the Santa Cruz River is conveyed to the Lower Santa Cruz Managed Recharge Project (LSCMRP) which extends along the river channel from Cortaro Road to Trico Road. Groundwater storage credits are issued from the Arizona Department of Water Resources (ADWR) for half of the effluent that reaches the water table. Credits are apportioned among participants in the LSCMRP in accordance with IGAs that recognize each party's entitlement.

Ina Road WRF					
Description			AFY	MG/Year	MGD Average
Influent			25,227.94	8,220.55	22.52
Process Water	*Used in industrial process at WRF, not included in effluent total used for allocations*		1,318.81	429.74	1.18
Effluent Usage	AZPDES discharge	*Outfall to Santa Cruz River, some available for credits, see chart x*	24,390.54	7,947.68	21.77
	Reuse on-site	*Construction and dust control*	56.91	18.54	0.05
Effluent Total	*Used for calculation of effluent allocations*		24,447.45	7,966.23	21.83

2. Roger Road Wastewater Reclamation Facility

The Roger Road WRF is located on the west side of Tucson and serves the greater Tucson metropolitan area. This plant has consistently produced the most effluent over the years, and its current capacity is 41 MGD. It produces Class B reclaimed water utilizing chlorination for disinfection. While some effluent is used for on-site irrigation, about one-third of the effluent is delivered to the COT for use in their reclaimed water system and for groundwater recharge. Remaining

III. Effluent Generated at Regional and Sub-Regional Wastewater Reclamation Facilities (Continued)

A. Metropolitan Facilities (Continued)

2. Roger Road Wastewater Reclamation Facility (Continued)

effluent is then dechlorinated prior to discharge into the Santa Cruz River under the authorization of an AZPDES permit. A portion of the effluent is also used to convey biosolids to Ina Road WRF for further processing.

Roger Road WRF					
Description			AFY	MG/Year	MGD Average
Influent			37,166.37	12,110.70	33.18
Process Water	*Used in biosolids flush water and other industrial processes at WRF, not included in effluent total used for allocations*		217.59	70.90	0.19
Effluent Usage	AZPDES discharge	*Outfall to Santa Cruz River, some available for credits, see chart x*	24,487.45	7,979.26	21.86
	Delivered reclaimed water	*Input to COT reclaimed system*	9,903.72	3,227.14	8.84
	Reuse on-site	*Irrigation at WRF*	106.02	34.55	0.09
Effluent Total	*Used for calculation of effluent allocations*		34,497.19	11,240.94	30.80

3. Randolph Park Wastewater Reclamation Facility

The Randolph Park WRF is located in midtown Tucson at the City-owned Randolph Park. This is a 3.5 MGD membrane bioreactor facility and utilizes an ultraviolet light disinfection system. This facility produces Class A effluent that is delivered directly into the COT's Reclaimed Water System.

A significant feature of the Randolph Park WRF is that it is considered a "scalping" plant. RWRD can control reclaimed water production by limiting influent taken from the sewer collection system. Periodically, Tucson Water will request a reduction of output at Randolph in order to manage their Reclaimed System. In 2012 no such requests for flow reduction were received by RWRD.

Under the 2000 Supplemental IGA and a 2003 Wheeling Agreement approved by COT and Pima County, the County agreed to deliver to the City an average of 1,000 AFY of reclaimed water during an initial delivery period. The balance of reclaimed water produced at Randolph may be put to public use by the County. Pima County's reclaimed water used under this arrangement is delivered by Tucson Water at a special Wheeling Rate based on system O&M costs. In FY2012 wheeling for Pima County was billed at $61.01 per AF; in FY 2013 it has been billed at $58.09 per AF.

III. Effluent Generated at Regional and Sub-Regional Wastewater Reclamation Facilities (Continued)

A. Metropolitan Facilities (Continued)

3. Randolph Park Wastewater Reclamation Facility (Continued)

Randolph Park WRF					
Description			AFY	MG/Year	MGD Average
Influent			2,816.99	917.92	2.51
Process Water	*Used in biosolids flush water and other industrial processes at WRF, not included in effluent total used for allocations*		9.84	3.21	0.01
	Delivered reclaimed water	*Input to COT reclaimed system*	2,447.78	797.61	2.19
	Reuse on-site	*Irrigation at WRF*	0.22	0.07	0.00
Effluent Total	*Used for calculation of effluent allocations*		2,448.00	797.68	2.19

4. Metropolitan Facilities Summary Table

Metropolitan Facilities - Overall Usage							
Description		Ina Road WRF	Roger Road WRF	Randolph Park WRF	All Facilities		
		AFY			AFY	MG/Yr	MGD
Influent Total		25,227.94	37,166.37	2,816.99	65,211.30	21,249.17	58.22
Process Water Total		1,318.81	217.59	9.84	1,546.24	503.84	1.38
Effluent Usage	AZPDES Discharge	24,390.54	24,487.45	0.00	48,877.99	15,926.94	43.64
	Delivered to COT Reclaimed Water System	0.00	9,903.72	2,447.78	12,351.50	4,024.75	11.03
	Reuse on-site	56.91	106.02	0.22	163.15	53.16	0.15
Effluent Total		24,447.45	34,497.19	2,448.00	61,392.64	20,004.85	54.81

III. Effluent Generated at Regional and Sub-Regional Wastewater Reclamation Facilities (Continued)

A. Metropolitan Facilities (Continued)

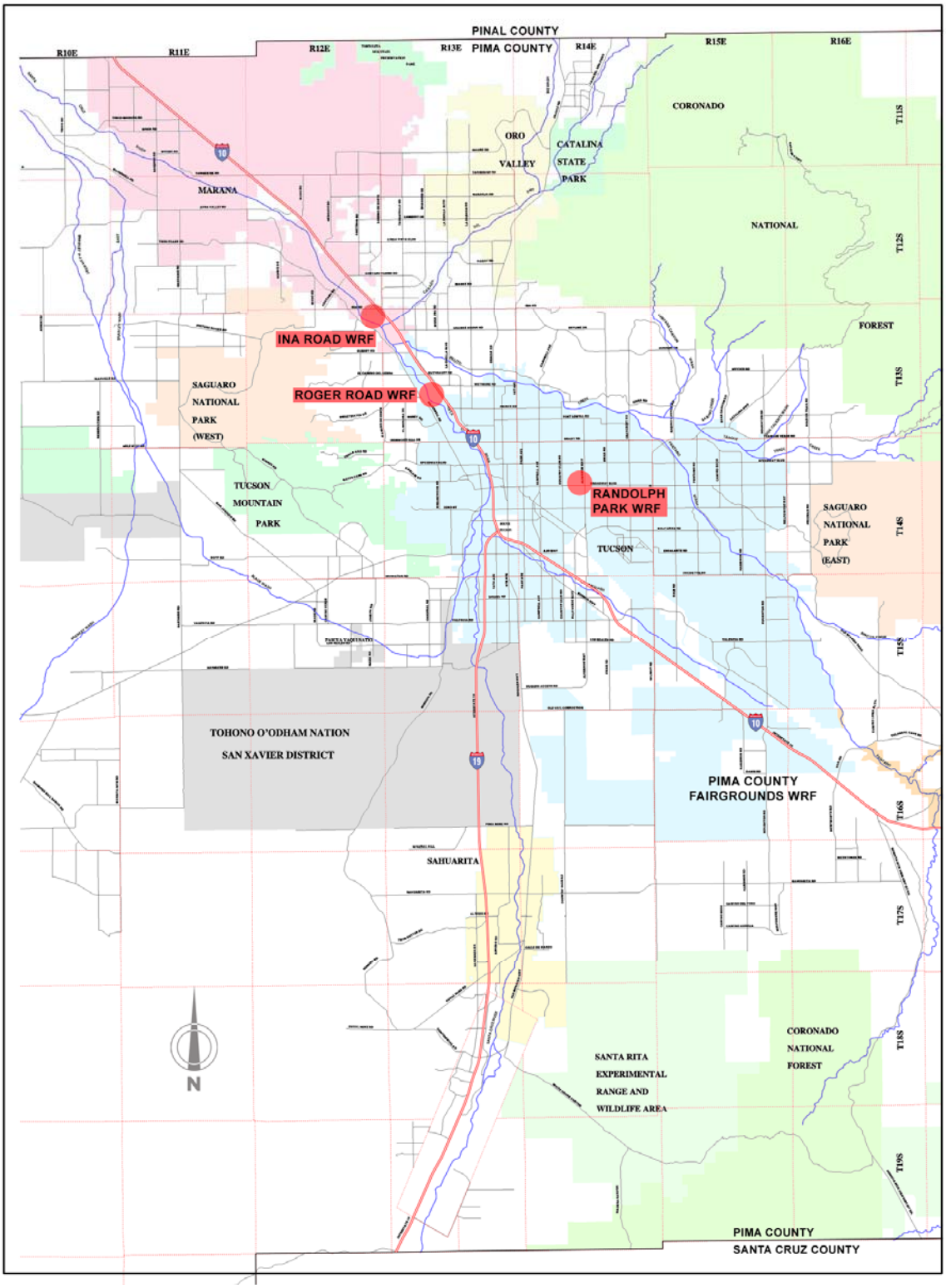
5. Metropolitan Facilities Historical Data

Year	Influent Received AF	Effluent Reused On-site at County WRFs AF	Effluent Discharged or Delivered to Reclaimed System AF	Effluent Total AF
Ina Road				
2003	27,071.50	806.9	26,407.60	27,214.50
2004	28,714.70	605.6	27,925.50	28,531.10
2005	26,149.80	665.7	24,552.10	25,217.80
2006	25,854.40	613.2	24,968.10	25,581.30
2007	28,840.60	8	27,856.30	27,864.30
2008	32,192.00	22.2	31,545.70	31,567.90
2009	28,960.41	24.61	28,527.58	28,552.19
2010	28,982.23	48.06	28,821.21	28,869.27
2011	27,746.58	60.91	27,368.49	27,429.40
2012	25,227.94	56.91	24,390.54	24,447.45
Roger Road				
2003	41,991.90	119.7	40,862.20	40,981.90
2004	40,957.00	599	39,025.80	39,624.80
2005	43,239.00	13.6	42,311.50	42,325.10
2006	43,381.20	63	40,864.80	40,927.80
2007	40,730.70	60.1	37,763.20	37,823.30
2008	36,823.60	116.3	34,194.20	34,310.50
2009	37,542.80	107.73	35,339.57	35,447.30
2010	35,279.07	70.31	33,261.83	33,332.14
2011	36,327.65	84.23	34,258.96	34,343.19
2012	37,166.37	106.02	34,391.17	34,497.19
Randolph Park				
2003	1.4	1.4	0	1.4
2004	114.7	0	97.5	97.5
2005	1,579.60	408.4	1,055.90	1,464.30
2006	2,785.40	679.5	1,878.50	2,558.00
2007	2,866.50	0.5	2,610.40	2,610.90
2008	2,973.60	0.3	2,661.60	2,661.90
2009	2,649.11	235.31	2,176.30	2,176.65
2010	2,738.75	0.30	2,337.37	2,337.67
2011	2,521.23	0.21	2,143.83	2,144.04
2012	2,816.99	0.22	2,447.78	2,448.00
Metropolitan Facility Totals				
2003	69,064.80	927.9	67,269.90	68,197.80
2004	69,786.40	1,204.60	67,048.80	68,253.40
2005	70,968.40	1,087.70	67,919.50	69,007.20
2006	72,021.00	1,355.70	67,711.40	69,067.10
2007	72,437.80	68.6	68,229.90	68,298.50
2008	71,989.20	138.8	68,401.50	68,540.30
2009	69,152.32	367.65	66,043.45	66,411.10
2010	67,000.05	118.67	64,420.41	64,539.08
2011	66,595.46	145.35	63,771.28	63,916.63
2012	65,211.30	163.15	61,229.49	61,392.64

III. Effluent Generated at Regional and Sub-Regional Wastewater Reclamation Facilities (Continued)

A. Metropolitan Facilities (Continued)

6. Metropolitan Facilities Map



III. Effluent Generated at Regional and Sub-Regional Wastewater Reclamation Facilities (Continued)

B. Non-Metropolitan Sub-Regional Facilities

1. Arivaca Junction Wastewater Reclamation Facility

The Arivaca Junction WRF is located in the town of Amado, approximately 38 miles south of Tucson. It consists of a single, 3.2-acre, aerated lagoon with a permitted treatment capacity of 100,000 gallons per day (GPD). Chlorination is the method of disinfection. Effluent disposal is via evaporation, percolation through the base of the unlined pond, and reuse. Evaporation ranges from 7,000 to 14,000 GPD, while percolation is approximately 10,000 GPD. RWRD has a reuse agreement with Reventone Ranch to accept delivery of this facility's Class C reclaimed water for restricted agricultural use.

Arivaca Junction WRF					
Description			AFY	MG/Year	MGD Average
Influent			53.98	17.59	0.05
Process Water	*Used in biosolids flush water and other industrial processes at WRF, not included in effluent total used for allocations*		0.00	0.00	0.00
Effluent Usage	Reclaimed, delivered to other parties	*Reventone Ranch*	32.22	10.50	0.03
	Groundwater Discharge	*Percolation through base of impoundment (estimated at 10,000 gallons per day)*	11.23	3.66	0.01
Effluent Total			43.45	14.16	0.04

2. Avra Valley Wastewater Reclamation Facility

The Avra Valley WRF is located on the west side of the Tucson Mountains, approximately 20 miles southwest of Tucson. The treatment facility has a permitted capacity of 4.0 MGD using two oxidation ditches for achieving nitrification and denitrification. It utilizes sand filtration, and UV treatment is the method of disinfection. Effluent produced at this facility can meet Class A+, but is permitted for Class B+ reclaimed quality. Effluent is discharged primarily by percolation through five recharge basins. Also, on-site reuse is possible for irrigation and dust control, and limited surface water discharge to Black Wash is covered under an AZDPES permit. In 2012 Avra Valley WRF continued to experience problems with influent metering devices.

III. Effluent Generated at Regional and Sub-Regional Wastewater Reclamation Facilities (Continued)

B. Non-Metropolitan Sub-Regional Facilities (Continued)

2. Avra Valley Wastewater Reclamation Facility (Continued)

Avra Valley WRF					
Description			AFY	MG/Year	MGD Average
Influent			1,525.61	497.12	1.36
Process Water	*Used in industrial processes at WRF, not included in effluent total used for allocations*		73.67	24.00	0.07
Effluent Usage	AZPDES Discharge	*Black Wash Spray Field*	0.00	0.00	0.00
	Groundwater Discharge	*Percolation beds and ponds - groundwater recharge without storage credit accrual*	1,377.60	448.89	1.23
	Reuse on-site	*Irrigation at WRF*	0.00	0.00	0.00
Effluent Total			1,377.60	448.89	1.23

3. Corona de Tucson Wastewater Reclamation Facility

The Corona de Tucson WRF is located 22 miles southeast of Tucson. The facility consists of a 1.0 MGD closed loop oxidation ditch for achieving both nitrification and denitrification. This facility is not classified for reuse. Effluent is disposed into percolation basins designed and permitted for groundwater recharge. Soil aquifer treatment (SAT) is the method of disinfection.

Corona de Tucson WRF					
Description			AFY	MG/Year	MGD Average
Influent			303.08	98.76	0.27
Process Water	*Used in industrial processes at WRF, not included in effluent total used for allocations*		0.00	0.00	0.00
Effluent Usage	Groundwater Discharge	*Percolation beds and ponds - groundwater recharge with storage credit accrual*	273.80	89.22	0.24
Effluent Total[1]			273.80	89.22	0.24

[1]A volume of 269.1 AF in storage credits was reported to ADWR for this recharge after subtracting evaporative losses.

III. Effluent Generated at Regional and Sub-Regional Wastewater Reclamation Facilities (Continued)

B. Non-Metropolitan Sub-Regional Facilities (Continued)

4. Green Valley Wastewater Reclamation Facility

The Green Valley WRF is located approximately 29 miles south of Tucson and serves the town of Green Valley. This facility is comprised of two distinct treatment sequences. The first consists of a 2.0 MGD oxidation ditch achieving nitrification and denitrification. Chlorination of this effluent produces Class A+ reclaimed water. The reclaimed water is delivered to Robson/Quail Creek for groundwater recharge. The other option for treatment at the facility can handle up to 2.1 MGD. It consists of two separate secondary aerated lagoons, two separate polishing ponds, and four percolation ponds. It produces the equivalent of Class B reclaimed water, but this stream is not classified for reuse in the Aquifer Protection Permit. Effluent from this portion of the facility is disposed of only through percolation.

Green Valley WRF					
Description			AFY	MG/Year	MGD Average
Influent			1,987.97	647.78	1.77
Process Water	*Used in industrial processes at WRF, not included in effluent total used for allocations*		0.00	0.00	0.00
Effluent Usage	Reclaimed, delivered to other parties	*Effluent from BNROD to Robson/ Quail Creek for groundwater recharge*	1,367.45	445.58	1.22
	Groundwater Discharge	*Percolation ponds (Lagoon Facility) - groundwater recharge without storage credit accrual*	915.88	298.44	0.82
Effluent Total			2,283.33	744.03	2.04

5. Mt. Lemmon Wastewater Reclamation Facility

The Mt. Lemmon WRF is located in the Village of Summerhaven in the Catalina Mountains. This facility operates under a special use permit issued by the United States Forest Service (USFS) that authorizes a treatment capacity of 17,000 gallons per day. The facility consists of a closed loop oxidation ditch for achieving both nitrification and denitrification. Effluent is disposed of through an off-site sprayfield, through a French drain, and through a surface water discharge to an unnamed tributary to the San Pedro River under an AZPDES permit. The facility currently is regulated by an APP general permit, so a reclaimed water classification is not possible. The spray application is to a restricted area of forest and is not regarded as reuse by ADEQ.

III. Effluent Generated at Regional and Sub-Regional Wastewater Reclamation Facilities (Continued)

B. Non-Metropolitan Sub-Regional Facilities (Continued)

5. Mt. Lemmon Wastewater Reclamation Facility (Continued)

Mt. Lemmon WRF					
Description			AFY	MG/Year	MGD Average
Influent			2.51	0.82	0.0022
Process Water	*Used in industrial processes at WRF, not included in effluent total used for allocations*		0.00	0.00	0.0000
Effluent Usage	Groundwater Discharge	*Discharge to spray field, drain, or AZPDES release to unnamed tributary to San Pedro River*	2.45	0.80	0.0022
Effluent Total			2.45	0.80	0.0022

6. Pima County Fairgrounds Wastewater Reclamation Facility

The PC Fairgrounds WRF is located approximately 18 miles southeast of Tucson and serves the fairgrounds complex. This facility has a permitted capacity of 20,000 GPD. It uses stabilization lagoons and the effluent is disposed of through evaporation and percolation. The facility currently is regulated by an APP general permit, so a reclaimed water classification is not possible.

Pima County Fairgrounds WRF					
Description			AFY	MG/Year	MGD Average
Influent			6.64	2.16	0.0059
Effluent Usage	Groundwater Discharge	*Percolation*	6.64	2.16	0.0059

7. Rillito Vista Wastewater Reclamation Facility

The Rillito Vista WRF is located near the Tangerine Road interchange on I-10 north of Tucson in the unincorporated community of Rillito. It is situated adjacent to the Arizona Portland Cement Co plant. This WRF consists of two, unlined, stabilization lagoons with a maximum capacity of 20,000 GPD. The facility is designed for evaporation and percolation. Since the facility currently is regulated by an APP general permit, a reclaimed water classification is not possible.

Rillito Vista WRF					
Description			AFY	MG/Year	MGD Average
Influent			5.80	1.89	0.0052
Effluent Usage	Groundwater Discharge	*Percolation*	5.80	1.89	0.0052

III. Effluent Generated at Regional and Sub-Regional Wastewater Reclamation Facilities (Continued)

B. Non-Metropolitan Sub-Regional Facilities (Continued)

8. Sub-Regional Facilities Summary

Sub-Regional Facilities - Effluent Usage											
		Arivaca	Avra Valley	Corona	Green Valley	Mt. Lemmon	Fair-grounds	Rillito Vista	All Facilities		
Description		AFY							AFY	MG/Yr	MGD
Influent Total		**53.98**	**1,525.61**	**303.08**	**1,987.97**	**2.51**	**6.64**	**5.80**	**3,885.59**	**1,266.12**	**3.47**
Process Water Total		**0.00**	**73.67**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**73.67**	**24.01**	**0.07**
Effluent Usage	AZPDES Discharge		0.00						0.00	0.00	0.00
	Reclaimed, delivered to other parties	32.22			1,367.45				1,399.67	456.08	1.25
	Groundwater Discharge (basin, percolation bed, infiltration gallery, spray field)	11.23	1,377.60	273.80	915.88	2.45	6.64	5.80	2,593.40	845.06	2.32
	Reuse on-site		0.00						0.00	0.00	0.00
Effluent Total		**43.45**	**1,377.60**	**273.80**	**2,283.33**	**2.45**	**6.64**	**5.80**	**3,993.07**	**1,301.15**	**3.56**

III. **Effluent Generated at Regional and Sub-Regional Wastewater Reclamation Facilities** (Continued)

B. Non-Metropolitan Sub-Regional Facilities (Continued)

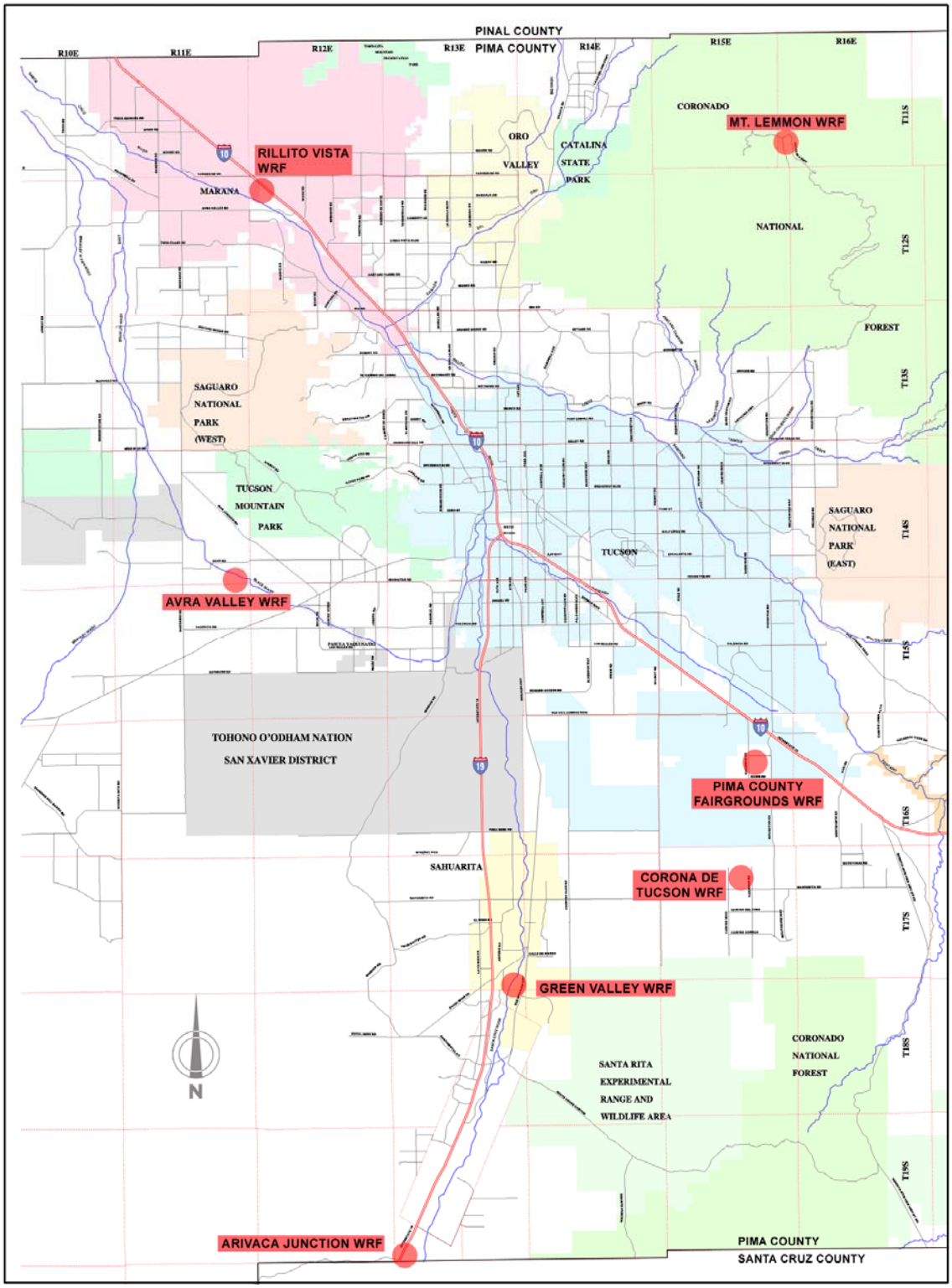
9. Summary Table of All Facilities

All Facilities - Effluent Usage					
	Metropolitan	Sub-Regional	All Facilities		
Description	AFY		AFY	MG/Yr	MGD
Influent Total	**65,211.30**	**3,885.59**	**69,096.89**	**22,515.29**	**61.69**
Process Water Total	**1,546.24**	**73.67**	**1,619.91**	**527.85**	**1.45**
AZPDES Discharge	48,877.99	0.00	48,877.99	15,926.94	43.64
Delivered to COT Reclaimed System	12,351.50		12,351.50	4,024.75	11.03
Reclaimed, delivered to other parties		1,399.67	1,399.67	456.08	1.25
Groundwater Discharge		2,593.40	2,593.40	845.06	2.32
Reuse on-site	163.15	0.00	163.15	53.16	0.15
Effluent Total	**61,392.64**	**3,993.07**	**65,385.71**	**21,306.00**	**58.37**

III. Effluent Generated at Regional and Sub-Regional Wastewater Reclamation Facilities (Continued)

B. Non-Metropolitan Sub-Regional Facilities (Continued)

10. Non-Metropolitan Facilities Map



IV. Reclaimed Water for Reuse, Environmental Restoration and Underground Storage (Groundwater Recharge)

A. Reclaimed Water Wheeled Through Tucson Water Reclaimed System

To take advantage of effluent as a renewable water supply, Pima County reuses a substantial volume of its wastewater for irrigation, construction, environmental restoration and other purposes. Most of this reuse is conducted by the Natural Resources, Parks and Recreation Department and the Kino Sports Complex/Kino Environmental Restoration Project. The supply of reclaimed water for various County sites is Class A reclaimed water wheeled through the City of Tucson Reclaimed Water System and delivered in the amounts shown in the following tables.

Natural Resources, Parks and Recreation			
2012 Monthly Reclaimed Water Use			
Month	**Gallons**	**Ccf**	**AF**
January	6,796,052	9,085.0	20.9
February	9,460,613	12,647.0	29.0
March	14,264,603	19,069.0	43.8
April	19,449,351	26,000.0	59.7
May	29,668,488	39,661.0	91.0
June	34,536,062	46,168.0	106.0
July	37,555,948	50,205.0	115.3
August	21,713,704	29,027.0	66.6
September	21,297,039	28,470.0	65.4
October	23,562,140	31,498.0	72.3
November	25,518,296	34,113.0	78.3
December	15,828,031	21,159.0	48.6
Total	**259,650,327**	**347,102.0**	**796.8**

IV. Reclaimed Water for Reuse, Environmental Restoration and Underground Storage (Groundwater Recharge) (Continued)

A. Reclaimed Water Wheeled Through Tucson Water Reclaimed System (Continued)

Kino Sports Park & KERP			
2012 Monthly Reclaimed Water Use			
Month	**Gallons**	**Ccf**	**AF**
January	509,423	681.0	1.6
February	0	0.0	0.0
March	494,462	661.0	1.5
April	136,894	183.0	0.4
May	7,531,387	10,068.0	23.1
June	11,469,881	15,333.0	35.2
July	12,615,896	16,865.0	38.7
August	7,383,273	9,870.0	22.7
September	2,790,234	3,730.0	8.6
October	10,115,906	13,523.0	31.0
November	9,605,735	12,841.0	29.5
December	8,150,774	10,896.0	25.0
Total	**70,803,865**	**94,651.0**	**217.3**

Historical Water Use at Kino Sports Park & KERP			
	Reclaimed		Harvested Stormwater
Year	**Ccf**	**AF**	**AF**
2003	156,042.8	358.2	87.00
2004	143,723.0	329.9	30.70
2005	78,493.0	180.2	64.90
2006	171,955.0	394.8	0.00
2007	69,389.0	159.3	65.95
2008	81,916.0	188.1	95.85
2009	163,725.0	375.9	0.00
2010	56,140.0	128.9	88.53
2011	74,907.7	172.0	50.22
2012	**94,651.0**	**217.3**	**36.79**
Total	**1,090,942.5**	**2,504.5**	**519.94**

IV. Reclaimed Water for Reuse, Environmental Restoration and Underground Storage (Groundwater Recharge) (Continued)

A. Reclaimed Water Wheeled Through Tucson Water Reclaimed System (Continued)

Yearly Reclaimed Water Use by Pima County from Tucson Water's Reclaimed System			
Year	**Gallons**	**Ccf**	**AF**
2003	69,573,993	93,006.9	213.5
2004	86,118,658	115,123.9	264.3
2005	74,349,631	99,391.0	228.2
2006	92,822,026	124,085.0	284.9
2007	295,588,987	395,145.0	907.1
2008	302,590,005	404,504.0	928.6
2009	418,643,532	559,645.0	1,284.8
2010	317,788,925	424,822.0	975.3
2011	366,899,807	490,473.7	1,126.0
2012	**330,454,192**	**441,753.0**	**1,014.1**

B. Environmental Restoration with Reclaimed Water

As part of Pima County's Sustainable Action Plan begun in FY `09, RWRD began tabulating the volume of effluent used for environmental restoration or riparian enhancement at various projects and sites. For some of the listed projects, riparian vegetation is one of the multiple benefits derived from operating a groundwater recharge project.

Environmental Restoration with Reclaimed Water			
Project Name	**Volume in Acre Feet**	**Multibenefit Recharge Project?**	**Comments**
Kino Environmental Restoration Project (KERP)*	0.0		Reclaimed water was not needed for riparian vegetation at the site during the year. KERP's vegetation is usually supported with harvested stormwater, except in particularly dry years.
Lower Santa Cruz Managed Recharge Project	95.9	Yes	This volume represents Pima County's share of the total evapotranspiration (ET) from the managed recharge project. The total ET was 1563.5 AF, and this volume is split among the participants by an agreed upon allocation formula.
Marana High Plains Effluent Recharge Project	17.4	Yes	Delivery of 559.6 AF was diverted from Santa Cruz River. Calculated evapotranspiration of 17.4 AF is the portion of the delivery volume that supports riparian vegetation.
Rillito Riparian/Swan Wetlands*	14.3		Reclaimed water is being used for the establishment of plants that were installed as part of this ecosystem restoration project.
Roger Rd WRF Pond	31.1		This volume is used to support a riparian and wildlife viewing pond adjacent to the Santa Cruz River on-site at the Roger Rd WRF.
Santa Cruz River- West Branch Bosques*	0.4		Small wetland area managed by PCRFCD. Reclaimed water used for vegetation establishment in water harvesting basins adjacent to existing mesquite bosque along West Branch of Santa Cruz River. Previously (2005-2011) provided drought relief for mature bosque vegetation.
Annual Total	**159.1**		

*Reclaimed water delivered through COT reclaimed water system.

IV. Reclaimed Water for Reuse, Environmental Restoration and Underground Storage (Groundwater Recharge) (Continued)

C. Underground Storage (Groundwater Recharge) of Effluent

Pima County operates, or participates in operation of, three facilities designed to replenish groundwater supply by recharging the aquifer. The source water for this recharge is wastewater effluent that has been treated to a high quality. Each recharge project operates under an Aquifer Protection Permit issued by ADEQ and an Underground Storage Facility Permit issued by ADWR. The tables below reflect the groundwater recharge credits earned and the most recent balance of Pima County's Long-term Storage Account with ADWR.

Summary of Recharge Volumes For Calendar Year 2012 (AF)						
PROJECT	**Delivery Volume**	**Evapo-transpiration**	**Contribution to Stream Diversions**	**Outflow**	**Cut to Aquifer**	**Recharge Credit**
Lower Santa Cruz Managed Recharge Project (LSCMRP)	906.91	95.90	170.00	634.90	320.52	320.52
Marana High Plains Effluent Recharge Project (MHPERP)	559.60	17.50				542.10
Corona de Tucson	274.29	5.20				269.09
Total	1,740.80	118.60	170.00	634.90	320.52	1,131.71

Long-term Storage Credit Summary			
Year	**County Share of Metro Effluent**	**County Storage Credits**	**Cumulative Credits**
	(AF)	**(AF)**	**(AF)**
2003	3,999.80	58.10	58.10
2004	4,005.30	449.30	507.40
2005	4,080.70	535.10	1,042.50
2006	4,086.70	532.30	1,574.80
2007	4,009.90	788.38	2,363.18
2008	4,034.00	1,025.89	3,389.07
2009	3,821.10	977.41	4,366.48
2010	3,633.91	1,085.37	5,451.85
2011	3,571.66	990.06	6,441.91
2012	3,319.26	1,131.71	7,573.62

IV. Reclaimed Water for Reuse, Environmental Restoration and Underground Storage (Groundwater Recharge) (Continued)

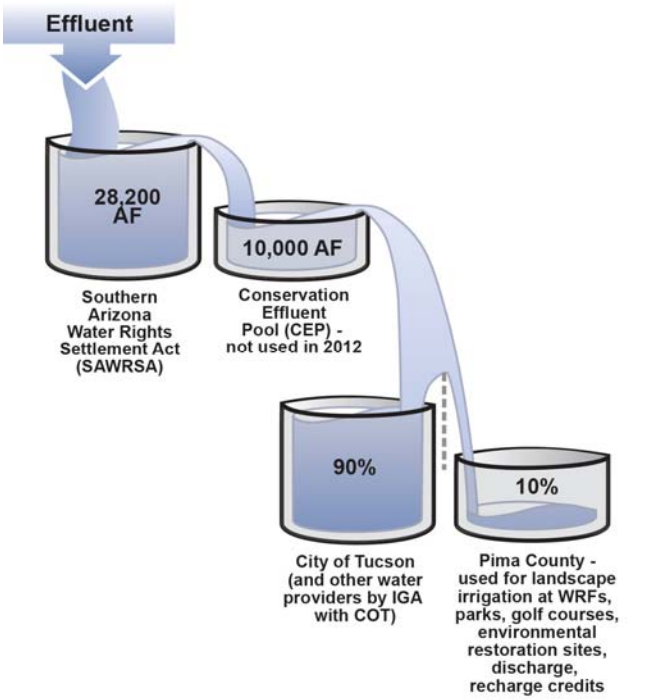
D. Summary of Use or Distribution of Pima County's Metropolitan Effluent Allotment

Pima County Effluent Use Summary (10% Metropolitan Allotment)					
Description			AFY	MG/Yr	MGD
Reuse	Reclaimed System	Natural Resources, Parks and Recreation	796.84	259.65	0.71
		Kino Sports Park & KERP	217.29	70.80	0.19
		System Loss (4% in 2012)	40.56	13.22	0.04
		Total from Reclaimed System	1,054.69	343.67	0.94
	Reuse on Metropolitan WRF sites		163.15	53.16	0.15
Santa Cruz Releases	Delivered to High Plains Constructed Recharge Project		559.60	182.35	0.50
	Qualified as Delivery to LSCMRP		906.91	295.52	0.81
	PC Share of Outflow from LSCMRP		634.92	206.89	0.57

V. Effluent Entitlements

The 1979 IGA and subsequent agreements govern effluent entitlement from the metropolitan facilities. In 2012 the total metropolitan effluent produced was 61,392.6 AF. The effluent allocation formula designated the fixed amount of 28,200 AF for the Bureau of Reclamation to manage under Southern Arizona Water Rights Settlement Act (SAWRSA). Of the remaining portion, the City of Tucson and other water providers received 29,873.4 AF, while Pima County retained 3,319.3 AF.

Entitlement Calculations	Effluent Total (AF)
Total Effluent	61,392.6
SAWRSA	28,200.0
Total Less SAWRSA	33,192.6
Water Providers Share	0.9
Pima County Share	0.1
Entities Share	
-Water Providers (90%)	29,873.4
-Pima County (10%)	3,319.3



V. **Effluent Entitlements** (Continued)

Allocation and use of effluent in Pima County are governed by a series of agreements and legal constraints. The key agreements are listed and described below:

A. 1979 Intergovernmental Agreement, Resolution No. 1979 - 78

The 1979 Intergovernmental Agreement, signed on June 26, 1979, was the original agreement between Pima County and the City of Tucson. This agreement assigned control of wastewater conveyance and treatment activities to PC RWRD. In exchange, the COT would receive 90% of all effluent produced at the RWRD metropolitan sites, which were limited to Ina Road WRF and Roger Road WRF at the time.

B. Southern Arizona Water Rights Settlement Act (SAWRSA)

SAWRSA stands for the Southern Arizona Water Rights Settlement Act of 1982 (P.L. 97-293) and the subsequent Arizona Water Settlements Act (P.L. 108-451--12/10/2004). The U.S. Department of Interior Bureau of Reclamation receives, on behalf of the Tohono O'Odham Nation, 28,200 acre-feet per year of secondary treated effluent from Tucson area wastewater treatment plants to assist in implementation of the settlement. Reclamation currently recharges this treated effluent in the Santa Cruz River and receives credit for 50% of the water recharged.

C. City of Tucson - Pima County Supplemental Intergovernmental Agreement Relating to Effluent, Resolution No. 2000-28

The 2000 Supplemental Intergovernmental Agreement signed on February 8, 2000, placed restrictions on how PC could use effluent. This agreement also exempted Sub-Regional treatment facilities from the City control, identified the need for reopening the Randolph Park WRF, and provided an avenue for the County to deliver County effluent to County facilities. This supplemental agreement also established a Conservation Effluent Pool for use with riparian habitat projects and identified how the Southern Arizona Water Rights Settlement Act (SAWRSA) volumes are to be treated in determining effluent allocations.

D. Conservation Effluent Pool Agreement

The Conservation Effluent Pool (CEP), which is a specific quantity of effluent that can be used for conservation projects, was identified in the 2000 Supplemental Intergovernmental Agreement. No CEP water can be used until the CEP agreement is approved by both the City and County and until the administrative procedures identified in the agreement are in place. The CEP agreement was approved by the Board of Supervisors in December 2010 and was approved by the City of Tucson's Mayor and Council in January 2011. 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 CEP water has been used through the reporting year, 2012.

V. **Effluent Entitlements** (Continued)

E. Intergovernmental Agreement between the COT and PC for Treating Effluent and Wheeling Reclaimed Water (Wheeling Agreement), Resolution No. 2003-286

The Wheeling Agreement, signed December 16, 2003, governs reclaimed water transactions between RWRD (the effluent provider), COT (the distributor and a reclaimed water user) and other County facilities (reclaimed water users). Effluent enters the system at the COT Sweetwater Plant and through direct delivery from the Randolph Park WRF, where it is piped to various locations. The agreement governs the costs per acre-foot that will be charged to PC for distribution of PC effluent to County sites.

F. Intergovernmental Agreement - Permitting and Operating Managed In-Channel Recharge of Effluent in the Santa Cruz River Channel (Managed Recharge IGA 2003)

The Managed Recharge IGA 2003 governs the recharge of effluent and the associated groundwater storage credits made available from recharging effluent into LSCMRP (Lower Santa Cruz Managed Recharge Project) between the Ina Road WRF and Trico Road in Marana. Participants include the Town of Marana, Cortaro-Marana Irrigation District, Avra Valley Irrigation District, Metropolitan Domestic Water Improvement District, Flowing Wells Irrigation District, Oro Valley, PC, and the COT.

VI. Effluent Generation and Use in the Tucson Active Management Area (TAMA)

ADWR and local water managers often examine the water budget from the perspective of the entire Tucson Active Management Area (TAMA). In order to show the overall picture of effluent production and use for this region, a table is included here that depicts the amount of effluent each entity controlled and how that effluent was utilized. Pima County's wastewater production constitutes the primary source of effluent in the region, but there are a number of other entities that operate treatment facilities. This data is somewhat incomplete in that information is not available for all of the smaller wastewater treatment facilities. However, future reports may be able to capture additional data in this regard, and the majority of effluent generated in the TAMA is represented below.

In 2012, the total amount of effluent produced in the TAMA was 68,021 AF. Of this total, a volume of 17,779 AF or 26% was either directly reused or recharged with subsequent recovery for use during the year. Aquifer recharge activity resulted in net accrual of 9,682 AF in long-term storage credit. About 29% of the effluent produced, or 19,499 AF, flowed out of the AMA according to measurement at the Trico Road gage on the Santa Cruz River. Finally, in 2012 a total volume of 19,409 AF or 29% of the effluent was either "cut to the aquifer" from recharge accounting or simply discharged in a manner that it was not accounted for as either reuse or recharge credit.

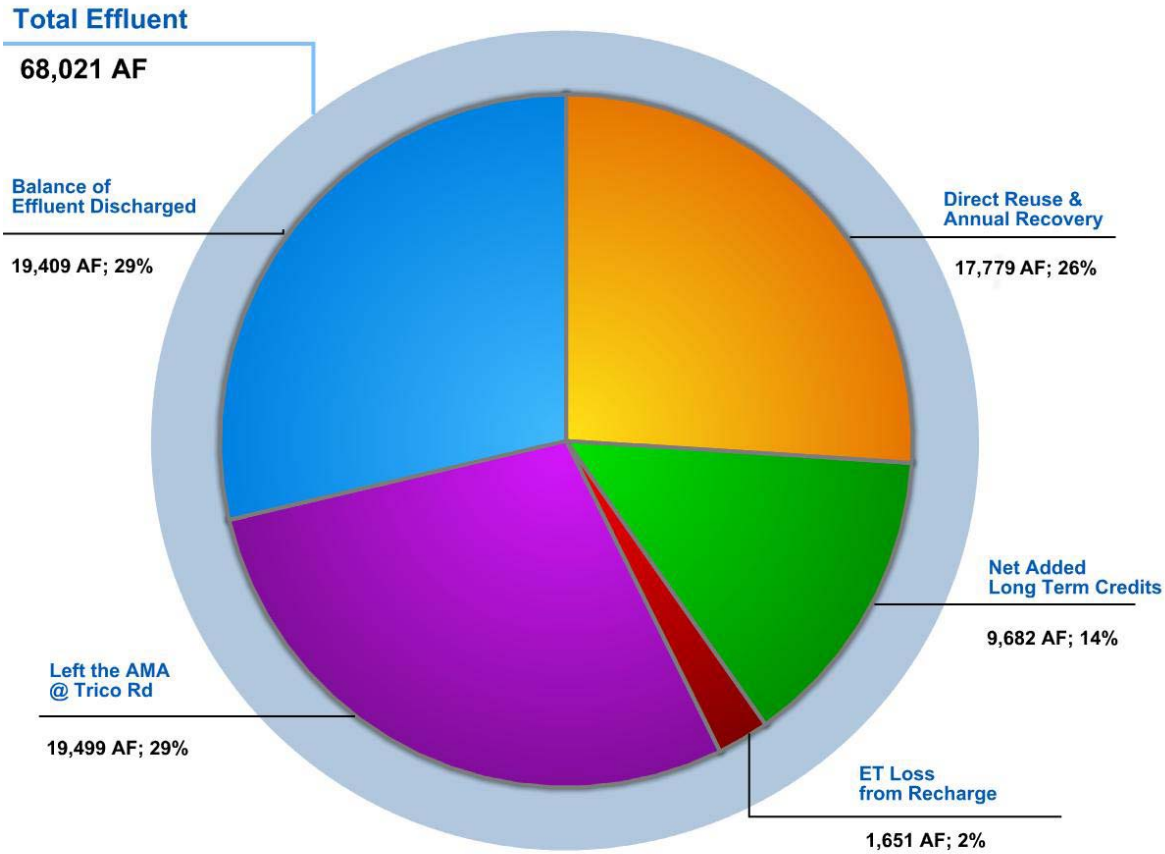


Figure 4: 2012 Tucson AMA Effluent Use and Dispensation

VI. Effluent Generation and Use in the Tucson Active Management Area (TAMA) (Continued)

Tucson AMA
Annual Effluent Utilization

Entities with Effluent	2012 Effluent Generation & Use in the Tucson AMA (values in acre-feet)												2012 Effluent Recharge Balance Activity			
			Off Channel Recharge (Constructed USF or GSF)				In Channel Recharge						Off Channel Recharge (Constructed USF or GSF)		In Channel Recharge	
	Net Effluent	Off Channel Recharge and Direct Reuse	Delivered to Off-Channel Recharge	Calculated Evaporation (ET loss)	Cut to the Aquifer	Annual Recovery	Delivered to In-Channel Recharge	Share of Down-stream Diversions[2]	Calculated Evaporation (ET loss)	Cut to the Aquifer	Outflow at Trico Rd Gage	Annual Recovery	Long-Term Credits Earned/ Reported	Long-term Credits Recovered	Long-Term Credits Earned/ Reported	Long-term Credits Recovered
PC Metropolitan WRF																
Secretary of the Interior[1]	28,200.0						15,591.6			7,795.8	12,608.4				7,795.8	
Conservation Effluent Pool																
Pima County[3]	3,319.3	1,777.4	559.6	17.5			1,466.5	729.6	95.9	320.5	634.9		542.1		320.5	
City of Tucson[1,4]	25,092.1	9,362.4	4,858.2	38.1		4,820.1	10,646.1	1,361.1	1,290.6	3,997.2	5,083.6	2,051.2		1,497.2	484.5	
Oro Valley	1,928.5	1,928.5														
Metro Water	2,171.5						1,277.2	239.4	135.0	451.4	894.2				451.4	
Flowing Wells	638.5						372.1	69.7	39.3	131.5	260.5	131.5				
Spanish Trail	42.7						25.1	4.7	2.6	8.8	17.6				8.9	
Subtotal	61,392.6	13,068.3	5,417.8	55.6		4,820.1	29,378.6	2,404.5	1,563.4	12,705.2	19,499.2	2,182.7	542.1	1,497.2	9,061.1	
PC Non-Metro WRF	3,993.1	274.3	274.3	5.2									269.1			
Other Facilities																
Sahaurita	896.3	737.9	737.9	21.3		108.6							608.0			
Sahuarita High School	1.3	1.3														
U of A Tech Park[5]	100.3	100.3														
Saddlebrooke/Saddlebrooke Ranch	510.9	510.9												422.0		
Robson Ranch Quail Creek	1,126.3	1,126.3	1,126.3	5.6									1,120.7			
Effluent Total	68,020.7	15,819.3	7,556.3	87.7		4,928.7	29,378.6	2,404.5	1,563.4	12,705.2	19,499.2	2,182.7	2,539.9	1,919.2	9,061.1	

Data from Entities with Effluent Entitlements

[1] In-channel recharge data include credits from both SCRMUSF + LSCRMRP

[2] Diversion of effluent off-channel is for agricultural use, which also counts as reuse

[3] Off channel recharge and direct reuse data include direct reuse of 1,217.8 af plus 559.6 af directed to constructed recharge.

[4] Off channel recharge and direct reuse data include direct reuse of 5,460 af plus 4,680.8 af directed to constructed recharge.

[5] Reporting period for this facility is Apr 2011 to May 2012

Summary Table

	AF	% of Total
Effluent Available	**68,020.7**	**100**
Direct Reuse & Annual Recovery	**17,778.9**	**26.1**
Net Added Long Term Credits	**9,681.8**	**14.2**
ET Losses from Recharge	**1,651.1**	**2.4**
Left Tucson AMA (@ Trico Rd)	**19,499.2**	**28.7**
Effluent Balance	**19,409.8**	**28.5**

VII. Glossary of Terms & Acronyms

Acre-foot (AF): A measure of water volume. One acre-foot of water will cover one acre to a depth of one foot and equals 43,560 cubic feet or 325,851 gallons. An acre-foot of water meets the needs of three average Tucson families for one year.
AFY: Acre-feet per year.
AMA or **Active Management Area:** Areas with heavy reliance on mined groundwater were identified and designated as Active Management Areas (AMAs) by the 1980 Arizona Groundwater Management Act. There are five AMAs: Prescott, Phoenix, Pinal, Tucson, and Santa Cruz, where groundwater is subject to state regulation.
Aquifer Protection Permit (APP): ADEQ's permit program to protect groundwater quality from discharging facilities.
Arizona Department of Environmental Quality (ADEQ): State agency responsible for groundwater quality protection, water quality standards, and wastewater reclamation and reuse permits.
Arizona Department of Water Resources (ADWR): State agency responsible for water management and administration of water-related programs within the State.
Arizona Pollutant Discharge Elimination System (AZPDES): Arizona's permit program to protect surface water quality. ADEQ holds NPDES primacy from EPA.
BADCT - Best Available Demonstrated Control Technology – the technical design standard applied by ADEQ in their APP program.
CCF: A water billing unit that equals 100 cubic feet or 748 gallons – this is the typical measure of metering for water delivery volumes for residential and commercial customers.
BNR - Biological Nutrient Removal.
BNRAS - Biological Nutrient Removal Activated Sludge.
BNROD - Biological Nutrient Removal Oxidation Ditch.
Class A Reclaimed Water: Treated wastewater that has undergone secondary treatment, filtration and disinfection to a level that is essentially pathogen-free. The "A" designation established by ADEQ is suitable for outdoor irrigation with unrestricted access and certain industrial uses.
Class A+ Reclaimed Water: Means wastewater that has undergone secondary treatment with nutrient reduction so that total nitrogen is less than 10 mg/l, followed by filtration and disinfection to a level that is essentially pathogen-free. The "A+" designation by ADEQ is suitable for "A" category uses without the need for liners, volume restrictions, and certain reporting requirements.
Class B Reclaimed Water: Treated wastewater that has undergone secondary treatment, and disinfection to meet the Partial Body Contact criteria. The "B" designation by ADEQ is suitable for outdoor irrigation with restricted access, construction, dust control, and livestock watering.
Class B+ Reclaimed Water: Treated wastewater that has undergone secondary treatment with nutrient reduction so that total nitrogen is less than 10 mg/l, followed by disinfection to be meet the Partial Body Contact criteria. The "B+" designation by ADEQ is suitable for "B" category uses without the need for liners, volume restrictions, and certain reporting requirements.
Class C Reclaimed Water: Treated wastewater that has undergone secondary treatment in a stabilization lagoon with aeration. This reclaimed water is suitable for livestock watering of non-dairy animals and irrigation of non-food crops.
Conservation Effluent Pool (CEP): Effluent set aside each year pursuant to an intergovernmental agreement between the City of Tucson and Pima County for use in riparian restoration projects.
Constructed Recharge: Replenishing the aquifer using a facility that is designed and constructed, in-channel, or off-channel, to store water underground pursuant to permits issued by ADWR.
COT: City of Tucson.
Disinfection: The treatment of water to inactivate, destroy, and/or remove disease-producing bacteria, viruses, and other microorganisms.
Effluent: Treated municipal wastewater.
Environmental Restoration: (also referred to as Riparian Restoration, Riparian Enhancement, or Habitat Restoration) Environmental restoration means enhancing existing ecosystems or creating new habitat. The goal of restoration is recovery of some functional characteristics of the ecosystem including plant communities and habitat structure. In most instances replication of historical ecosystems isn't possible, but enhancing vegetation can result in sustainable habitat that helps restore ecosystem function and its support for wildlife and increased biodiversity. Enhancements may also include erosion control, improved water quality and achieving a self-sustaining, functional flow regime.

ET: Evapotranspiration, which accounts for water that is both evaporated and absorbed by plants and transpired into the atmosphere.
GPD: Gallons per day.
Intergovernmental Agreement (IGA): An agreement authorized by state statute between two or more governmental entities that provides for joint action or joint exercise of governmental powers.
KERP: Kino Environmental Restoration Project. The KERP basin is approximately 27 acres of watercourse and riparian habitat within the 120-acre Ajo Detention Basin. This project harvests stormwater and uses reclaimed water for both environmental restoration and irrigation of sports fields and landscape.
LSCMRP: Lower Santa Cruz River Managed Recharge Project.
Managed Recharge: A facility that uses the unmodified natural channel of a stream to artificially recharge and store water underground in an aquifer pursuant to permits issued by ADWR.
Metropolitan (or Metro) Wastewater Reclamation Facility: This term refers to any of the three metropolitan wastewater reclamation facilities operated by RWRD: Ina Rd, Roger Rd, and Randolph Park.
MG: Million gallons.
MGD: Million gallons per day – one means of measuring discharge or flow volume.
MHPERP: Marana High Plains Effluent Recharge Project.
Milligrams per Liter (mg/l): A unit of measure of dissolved or suspended concentration within a fluid that equates to parts per million.
Oxidation Ditch: The oxidation ditch is a component of the wasewater treatment process that provides long-term aeration. It consists of a long channel laid out in an elliptical or circular configuration. The channel is equipped with mechanical aeration equipment, such as brush rotors, disc aerators, draft tube aerators, or fine bubble diffusers. The design generates wastewater flow through the ditch, stirring water in the channel and supplying oxygen. A certain amount of settled solids (sludge) is added into the incoming wastewater in order to activate the bacterial treatment.
PC: Pima County.
Recharge: Water that replenishes an aquifer by surface infiltration or by other natural or induced means.
Reclaimed Water: Means water that has been treated or processed by a wastewater treatment plant (A.R.S. §49-201.31).
Regional Wastewater Reclamation Facility: This term refers to any of the three metropolitan wastewater reclamation facilities operated by RWRD: Ina Rd, Roger Rd, and Randolph Park.
RFCD (or PCRFCD): Pima County Regional Flood Control District.
RWRD (or PCRWRD): Pima County Regional Wastewater Reclamation Department.
Riparian: Pertaining to or situated on the bank of a body of water, especially a river.
Soil-Aquifer Treatment: Use of the physical, chemical, and/or microbiological properties of the soil and the aquifer to provide treatment of water introduced into the groundwater system.
Southern Arizona Water Rights Settlement Act (SAWRSA): 1982 federal legislation to settle water-rights claims of the Tohono O'odham Nation against City of Tucson and several other parties.
Stabilization Lagoons: This type of treatment facility consists of shallow man-made basins comprising a single or several series of anaerobic, facultative or maturation ponds that are operated without aeration. Such ponds allow suspended solids to settle and the soluble element of organic matter (BOD) is reduced through the coordinated activity of algae and heterotrophic bacteria.
Sub-regional: A term used to describe the non-metropolitan wastewater reclamation facilities in Pima County. This group includes Arivaca Junction, Avra Valley, Corona de Tucson, Green Valley, Marana, Mount Lemmon, Pima County Fairgrounds, and Rillito Vista.
Surface Water: Water on the Earth's surface, such as in a stream, river, lake, or reservoir.
Underground Storage: Recharge of the groundwater in a manner that anticipates eventual recovery from the aquifer. In Arizona this usually involves establishing an account with ADWR for tracking short- or long-term storage credits.
USBR: United States Bureau of Reclamation.
UV: Ultra-Violet, which is a band of wavelengths of light that is useful in disinfecting wastewater.
Water Harvesting: The process of intercepting stormwater from a surface, such as a roof, parking area, or land surface, and putting it to beneficial use.
Wheeled Water or Water Wheeling: Water transferred between two agencies whereby one agency uses its system infrastructure to treat and/or convey water that is owned by the receiving agency.
WRF: Wastewater Reclamation Facility.