

Edwards Aquifer Regional Water Conservation Program Leon Valley Assessment Report and Proposed Implementation Plan

Prepared For



Edwards Aquifer Authority

Prepared By



Texas A&M Water Conservation & Technology Center

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Edwards Aquifer Habitat Conservation Plan Regional Water Conservation Program

Leon Valley Assessment Report and Proposed Implementation Plan

Table of Contents

Executive Summary	iii
Introduction	1
Water System Summary	2
Water Use and Demand	3
Current Water Supply	3
Current Water Use	3
Historical Water Use	3
Expected Growth and Projected Water Demand	4
Water Conservation Baseline Condition	6
Administrative Conservation Measure	6
Baseline Condition and Opportunities for Conservation – RWCP Elements	7
High-Efficiency Plumbing Program	7
Leak Detection and Lost Water Management Program	8
Commercial Large-Scale Retrofit Program.....	10
<i>Commercial Large-Scale Retrofit Program for Multi-Family Complexes</i>	10
<i>Commercial/Industrial/Institutional Large-Scale Retrofit Program</i>	12
Reclaimed Water Program.....	15
Opportunities to Use Alternative Water Sources	16
RWCP Participation	17
Community Initiatives or Recommendations	17
High-Efficiency Plumbing Storage and Distribution Facilities.....	18
Interest in Supporting RWCP Elements for Leon Valley Edwards Aquifer Exempt Well Users	19
Conclusions and Recommendations	21

Definitions 25

References 26

Appendix..... 27

Edwards Aquifer Habitat Conservation Plan Regional Water Conservation Program

Leon Valley Assessment Report and Proposed Implementation Plan

Executive Summary

Estimated total cost of the proposed three-year Leon Valley Regional Water Conservation Program (RWCP) is **\$303,960**, at an average cost of **\$958** per acre-foot of water conserved annually. When the program is fully implemented, the water conserving repairs, fixtures, equipment, processes, and systems are expected to save an estimated 317.33 acre-feet of water on an annually recurring basis, which would provide **160.82 acre-feet** to the Edwards Aquifer Groundwater Trust. Based on the specific needs, concerns, and past, current, and planned water conservation activities of the City of Leon Valley, the proposed Leon Valley RWCP elements are as follows.

1. Leak Detection Program: The City of Leon Valley Department of Public Works would select a contractor to conduct a citywide leak detection survey. The City's designated Utility crew would repair leaks as they are identified during the survey, which is expected to result in 100.00 acre-feet of water savings and **50.00 acre-feet** of water for the Edwards Aquifer Groundwater Trust on an annually recurring basis. The total cost of this program is projected to be **\$25,000**, at an estimated cost of **\$250** per acre-foot of water conserved annually.
2. Commercial, Industrial, and/or Institutional Large-Scale Retrofit Program: The City of Leon Valley would issue rebates for approved large-scale commercial, industrial, and/or institutional retrofit projects. Water customers would receive rebates for instituting technological changes to alternative water conservation equipment and/or processes at their businesses or institutions. This use of water-saving equipment and/or processes is expected to result in at least 166.67 acre-feet of water savings and **83.33 acre-feet** of water for the Groundwater Trust on an annually recurring basis. The total cost of this three-year program would be **\$150,000**, at a maximum cost of **\$900** per acre-foot of water conserved annually.
3. Commercial Large-Scale Retrofit Program for Multi-Family Complexes: The City of Leon Valley would contract with local plumbers to install replacement high-efficiency toilets, showerheads, and sink faucet aerators in multi-family residential complexes. Use of these water-saving fixtures is expected to result in 46.35 acre-feet of water savings and **23.17 acre-feet** of water for the Edwards Aquifer Groundwater Trust on

an annually recurring basis. The total cost of this three-year program is projected to be **\$122,360**, at an estimated cost of **\$2,640** per acre-foot of water conserved annually. These estimated costs include the purchase and delivery of the high-efficiency plumbing fixtures and the plumbing installation cost.

4. Exempt Well User High-Efficiency Plumbing Program: The City of Leon Valley would distribute 60 ultra low-flow toilets and high-efficiency showerheads and aerators to qualified Leon Valley Edwards Aquifer exempt well users during the three-year program. Use of these water-saving fixtures is expected to result in 4.32 acre-feet of water savings and **4.32 acre-feet** of water for the Edwards Aquifer Groundwater Trust on an annually recurring basis. The three-year cost of this program is projected to be **\$6,600**, at an estimated cost of **\$1,529** per acre-foot of water conserved annually. These estimated costs include the purchase and delivery to the Leon Valley area of the high-efficiency plumbing fixtures.

Introduction

The primary goal of the Edwards Aquifer Habitat Conservation Plan (EAHCP) Regional Water Conservation Program (RWCP) is to conserve 20,000 acre-feet of water on an annually recurring basis to provide 10,000 acre-feet as a Groundwater Trust in the Edwards Aquifer for the life of the EAHCP, fifteen (15) years. Maintenance of this 10,000 acre-foot Trust in the Edwards will benefit flows at San Marcos and Comal Springs, supporting the habitat of eleven (11) Covered Species.

The purpose of this Assessment Report and Proposed Implementation Plan (hereafter referred to as Report or Plan) is to document the City of Leon Valley baseline condition and identify water conservation opportunities that exist in the City of Leon Valley utilizing any or all of the four (4) RWCP elements: 1) High-Efficiency Plumbing Fixtures and Toilet Distribution, 2) Lost Water and Leak Detection, 3) Commercial/Industrial Retrofits, and 4) Water Reclamation.

This Plan must be presented to the EAHCP Regional Conservation Monitoring Committee for review and comment. If selected for implementation, EAHCP staff would structure the Plan into a contract that would be presented to the Edwards Aquifer Authority (EAA) Board of Directors and the Leon Valley City Council for approval. This contract would delineate commitments and responsibilities and serve as the funding mechanism between the EAA and the City of Leon Valley.

In return for the EAHCP RWCP funds and technical assistance, the City of Leon Valley would commit fifty percent (50%) of their realized water savings resulting from the RWCP conservation activities outlined in this Plan to be held in the Edwards Aquifer Groundwater Trust as an unused balance for fifteen (15) years.

Water System Summary

The City of Leon Valley, located in west central Bexar County, has a current population of approximately 10,600. The City owns and operates a public water system that provides water to approximately two-thirds (2/3) of the City, while the other one-third (1/3) of water users in the City get their water from the San Antonio Water System (SAWS). The Leon Valley water system currently has 2,254 residential connections, 5 multi-family connections, and 287 commercial/industrial/institutional connections, for a total of 2,546 connections. The Leon Valley water system does not have any wholesale customers. According to the American Community Survey and the U.S. Census Bureau's Population Estimates Program, there are 4,750 total housing units in Leon Valley.¹

Water Use and Demand

Current Water Supply

The City of Leon Valley water system utilizes the Edwards Aquifer as its sole potable water source. The City currently owns 1,607 acre-feet of Edwards Aquifer water for municipal uses and also holds leases for another 672.37 acre-feet of Edwards Aquifer water, totaling 2,279.37 acre-feet. Of this 672.37 acre-feet of leased water, a 200 acre-feet lease expires in 2014, another 200 acre-feet lease expires in 2015, and the remaining 272.37 acre-feet lease expires in 2019. To make up for their expiring water leases, the City purchased an additional 46 acre-feet of Edwards Aquifer water rights in 2013, and plans to purchase 46 acre-feet per year until their total water owned is 2,200 acre-feet. The City also purchases treated effluent from SAWS for landscape irrigation at the City Complex and Raymond Rimkus Park.

Current Water Use

The total 2013 water use by the City of Leon Valley was approximately 1,580 acre-feet, including both water supplied by the City water system and SAWS. Again, the City's system provides water to approximately 2/3 of Leon Valley's population, about 1,050 acre-feet, and the other 1/3 of the City get their water from SAWS, about 530 acre-feet. The Leon Valley water system has never had a pumping limit violation and the City as a whole has never experienced an actual water shortage. Critical Period Management pumping restrictions have been in place, however, for Leon Valley, as well as San Antonio and surrounding communities, for the past two (2) years due to serious drought conditions. While the EAA declared Critical Period Stage 3 during Summer 2013, requiring a 35% reduction of groundwater withdrawals from the San Antonio pool of the Edwards Aquifer for the number of days Stage 3 is in effect; Leon Valley followed SAWS' lead and remained at Stage 2. The EAA's declaration of Stage 3 would reduce the amount of Edwards Aquifer water annually available to the City from 2,279.37 acre-feet to 1,481.59 acre-feet, if Stage 3 remained in place for the entire year.

Historical Water Use

In 1971 (when the Texas Water Development Board's records start), the City of Leon Valley's population was approximately 2,300 and the annual water use was about 500 acre-feet. The City population grew steadily to almost 13,000 in the late 1980's, when it took a sharp drop to about 9,500. Since that time, the population has gone up and down in the 9,000 to 10,500 range, with a notable drop in 2000, a smaller decline from 2009 to 2010, followed by growth to 2012 and slight moderation to the current population of

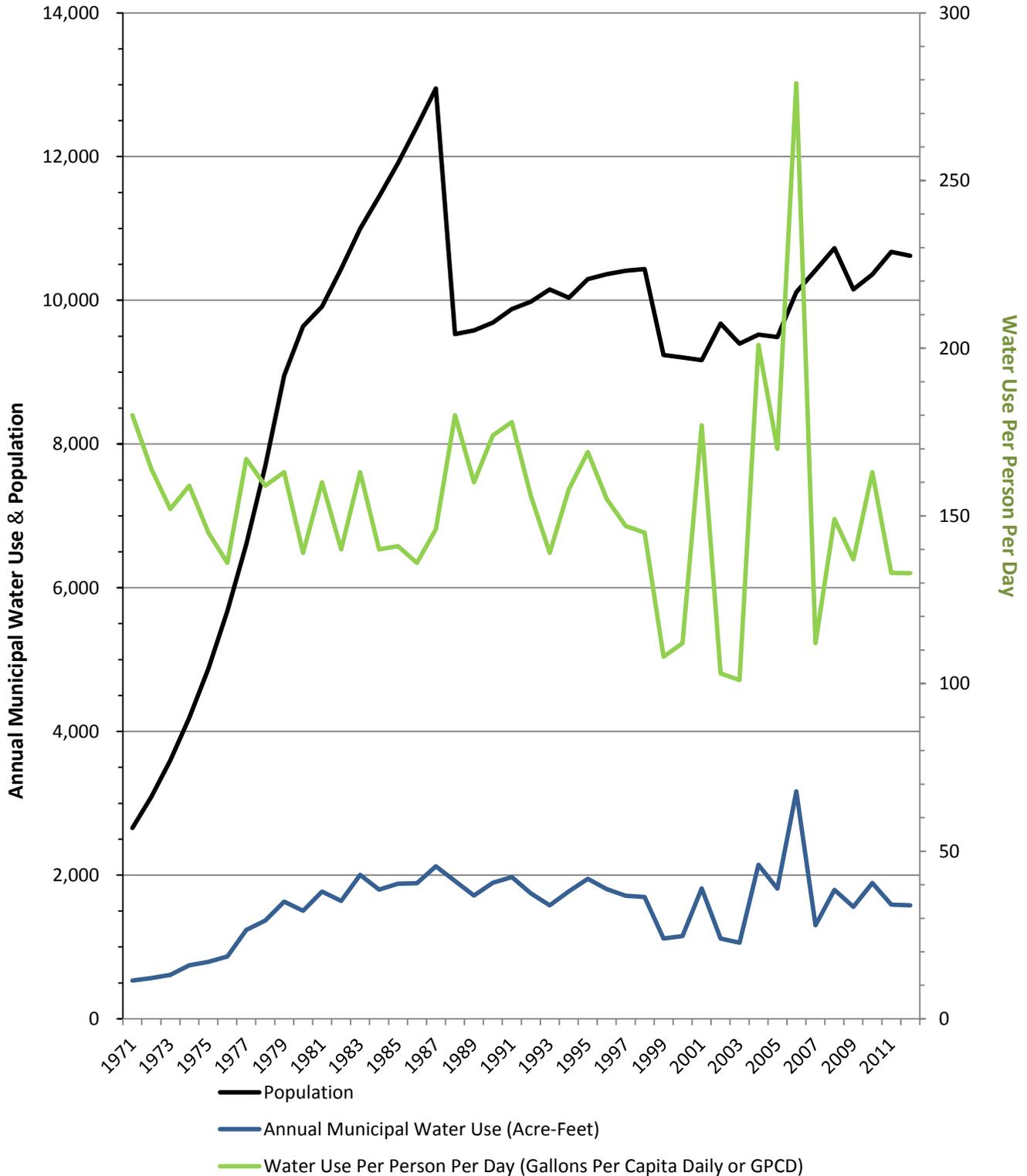
approximately 10,620. Meanwhile the City's water use grew slowly until 1980, when it leveled off in the 1,500 to 2,000 acre-foot range. With the population drop in 2000, water use likewise dropped to about 1,100 acre-feet and remained at that level, aside from a spike in 2002, until 2005 when it rose to about 2,100 acre-feet. The City's water use peaked at just over 3,100 acre-feet in 2007, dropped to about 1,300 acre-feet in 2008, and has fluctuated between 1,500 and 1,900 acre-feet since then. Municipal water use per person has correspondingly fluctuated over the years, ranging from 101 gallons per person per day (*i.e.*, gallons per capita daily or GPCD) in 2004 to 279 GPCD in 2007, and averaging 154 GPCD. The City's 2013 total water use was approximately 1,580 acre-feet and per person water use was 133 GPCD. Refer to Figure 1 on page five (5) to see this data displayed graphically. Also refer to the Appendix for the City's annual population, total municipal water use, and total water use per person data.

Expected Growth and Projected Water Demand

Leon Valley's growth rate over the last five (5) years and the City's expected future growth rate is 1.245%. Leon Valley officials estimate that the largest contiguous block of land still available for development is approximately 100 acres and the City is about 90 to 92% built out. There is some potential for single-family residential development and even more opportunity for multi-family development in the City. It is believed that the available space will be filled out by 2020 and the population at that time will be approximately 13,650.

The City of Leon Valley's projected water demand for 2010 was identified in the 2011 South Central Texas Regional Water Plan as 1,091 acre-feet. The City's actual 2010 water use of 1,558 acre-feet was significantly more than projected. According to the Regional Water Plan, City of Leon Valley demand would decrease from 1,091 acre-feet in 2010 to a projected low of 1,022 acre-feet in 2050, then rise slightly to 1,036 acre-feet in 2060.²

Figure 1 – Leon Valley Population, Annual Municipal Water Use in Acre-Feet, and Water Use Per Person Per Day in Gallons (i.e., Gallons Per Capita Daily or GPCD)



Water Conservation Baseline Condition

Administrative Conservation Measure

Since 1997, Leon Valley Public Works has used a tiered rate structure for City water customers. Tiered rates are non-linear; rather, water rates increase significantly with increasing use. Prior to implementing a tiered rate structure, the City's average per person water use was 158 GPCD. Under the tiered rate structure, average daily use dropped to 148 GPCD. This drop can be seen in the Appendix on page 27.

Baseline Condition and Opportunities for Conservation – RWCP Elements

High-Efficiency Plumbing Program

The City of Leon Valley has a long-standing toilet voucher program that provides its residential water customers with a \$50 rebate when they replace a high-flow toilet manufactured before January 1993 with a new high-efficiency toilet. There is a limit of two (2) toilet rebates per household. City Public Works staff inspect replaced toilets and then the rebate is processed. The City has spent \$64,400 and processed 1,288 toilet rebates since inception of their toilet voucher program in 1993. Leon Valley has also distributed plumbing retrofit kits (i.e., showerheads and sink aerators) at City events.

An additional component of Leon Valley's current High-Efficiency Plumbing Program is a voucher program for replacement of residential high-water use washing machines with 14-gallon high-efficiency washing machines. The City has processed more than 142 rebates at \$100 each for a total of at least \$14,200 spent on this voucher program since its 2000 inception. Public Works management plan to continue both of these voucher programs.

Based on an analysis of pre-1993 housing data, City officials estimate that approximately 57% of single-family households in the City of Leon Valley have already taken advantage of one or both of these programs and are using high-efficiency models. Because of their long-standing, successful program and this high replacement percentage, City management is not interested in expanding their residential High-Efficiency Plumbing Program at this time.

Leak Detection and Lost Water Management Program

All existing and new water accounts in Leon Valley are metered. Meters ten (10) years and older are tested for accuracy. The City has as an aggressive meter rebuild and replacement program and recently completed replacement of the City's residential meters with touch-read meters.

The City of Leon Valley has not conducted a leak detection survey, however, for over ten (10) years. Only about six percent (6%) of the water the City pumped from the Edwards Aquifer in 2011 was unaccounted for, amounting to approximately 74 acre-feet. Up moderately, eight percent (8%) of the water was unaccounted for in 2012, approximately 85 acre-feet. Water loss increased more in 2013, reaching ten percent (10%) of water pumped, approximately 105 acre-feet.

Leon Valley management want to have a citywide leak detection survey conducted to reverse this negative trend and decrease this volume of lost water. Public Works officials project that at least 100 acre-feet of leaks would be identified by such a survey. The City has a designated four-person Utility crew responsible for repairing leaks within 24 hours of detection. The projected water savings from repairing leaks identified by a citywide leak detection survey would be approximately 100 acre-feet, which would provide 50 acre-feet to the Edwards Aquifer Groundwater Trust annually, as shown in the following calculations.

Projected 50% Annual Contribution to the Trust from the City of Leon Valley:

100 acre-feet saved/year x 0.5 = **50 acre-feet/year** Realized Water Savings to the
Groundwater Trust

To implement this Plan, the EAA would provide \$25,000 for the leak detection survey, which is the estimated cost for a water system of Leon Valley's size, and Leon Valley Public Works would promptly repair the identified leaks.

Recommendation

The EAA provide \$25,000 for a citywide leak detection survey.

Leon Valley Public Works staff contract for a citywide leak detection survey and quickly repair leaks as they are identified.

- ***The EAA would reimburse the City \$25,000 for the leak detection survey.***
- ***The Realized Water Savings contributed annually to the Edwards Aquifer Groundwater Trust by the City of Leon Valley in return would be 50 acre-feet of water.***

- *The estimated cost per acre-foot of water conserved annually would be \$250.*

**Table 1 – Leak Detection Program
Budget and Projected Water Conserved**

Leon Valley Leak Detection Program	Estimated Total Cost	Estimated Water Conserved Annually (Gal)	Estimated Water Conserved Annually (Ac-ft)	Calculated Cost Per Ac-Ft of Water Conserved Annually (Total Cost / Water Conserved Annually)	Projected 50% Annual Contribution to GW Trust (Ac-Ft)
Citywide Leak Detection Survey	\$25,000	32,585,100	100.0	\$250	50.0

Note that this \$25,000 would be paid directly to the City of Leon Valley in reimbursement for the cost to contract for a citywide leak detection survey.

Commercial Large-Scale Retrofit Program

Commercial/industrial/institutional water connections in Leon Valley generally include shopping centers, restaurants, laundromats, car washes, and an automobile dealership. Shown below are the ten (10) commercial accounts with the highest water use in 2013. These water system customers indicate potential targets for the Large-Scale Retrofit Program.

1. Shadow Valley Apartments = 381.4 acre-feet
2. Leon Trace Apartments, Thomson & Thomson I, Ltd = 176.8 acre-feet
3. Sierra Royale Apt Homes, Sierra Residential Partners = 137.7 acre-feet
4. Intown Suites = 106.7 acre-feet
5. Diamond Shine LLC Car Wash = 94.4 acre-feet
6. Kwik Wash Laundries = 92.7 acre-feet
7. Omninet Tower, LP (office building) = 81.9 acre-feet
8. Bandera Pass Manufactured Home Community = 80.7 acre-feet
9. Ancira-Winton Chevrolet = 75.5 acre-feet
10. Intown Suites = 72.8 acre-feet

Commercial Large-Scale Retrofit Program for Multi-Family Complexes

The list above shows that Leon Valley's highest water users by far are multi-family residential complexes. The first three (3) businesses listed are apartment complexes that were constructed before 1992 and would achieve significant water savings if their toilets, showerheads, and sink faucet aerators were converted to high quality, high-efficiency models. Leon Valley management is interested in these multi-family residential complexes being one target of their Commercial Large-Scale Retrofit Program.

The three (3) apartment complexes have a total of approximately 440 dwelling units and approximately 644 bathrooms. The industry standard estimated water savings for replacement of a high-water use toilet with a high-efficiency model is 12,600 gallons per year. The industry standard estimated water savings per showerhead/aerator retrofit is 10,850 gallons per year, for a combined estimated savings of 23,450 gallons per year. Replacement of 644 toilets, showerheads, and sink aerators during the three-year Leon Valley RWCP would therefore save a projected 46.35 acre-feet of water on an annually recurring basis, which would provide 23.17 acre-feet to the Edwards Aquifer Groundwater Trust, as shown in the following calculations.

$$\frac{644 \text{ toilets \& plumbing kits distributed} \times (23,450 \text{ gallons/year})}{(325,851 \text{ gallons/acre-foot})} = 46.35 \text{ acre-feet saved per year}$$

Projected 50% Annual Contribution to the Groundwater Trust from the City of Leon Valley:
46.35 acre-feet saved/year x 0.5 = **23.17 acre-feet/year** Realized Water Savings to the
Groundwater Trust

The EAA has contracted with a high-efficiency plumbing fixture vendor for the procurement and delivery of high-efficiency toilets, showerheads, and sink faucet aerators to EAA water purveyors participating in the RWCP.

To implement this Plan, the EAA would purchase and coordinate delivery to Leon Valley of approximately 644 ultra low-flow toilets and high-efficiency plumbing kits during Leon Valley's three-year RWCP. Each toilet includes a base, tank, seat, wax ring, and necessary bolts. A plumbing kit consists of one (1) showerhead and two (2) sink faucet aerators. Leon Valley management would select a plumbing contractor that would move from apartment complex to complex, efficiently completing the plumbing fixture replacements.

Recommendation

The EAA contract for purchase and delivery of an estimated 644 ultra low-flow toilets and high-efficiency showerheads and aerators to Leon Valley as needed for commercial retrofit at multi-family complexes.

The EAA provide approximately \$51,520 for plumbing fixture replacement.

The City of Leon Valley contract with local plumbers to remove the old and install the new plumbing fixtures at participating multi-family complexes at an estimated cost of \$51,520.

- ***The estimated cost for the high-efficiency plumbing fixtures would be \$70,840 and installation costs would be approximately \$51,520, for a total estimated cost of \$122,360.***
- ***The projected Realized Water Savings contributed annually to the Edwards Aquifer Groundwater Trust by the City of Leon Valley in return would be 23.17 acre-feet of water.***
- ***The estimated cost per acre-foot of water conserved annually would be \$2,640.***

Table 2 – Commercial Large-Scale Retrofit Program for Multi-Family Complexes Budget and Projected Water Conserved

Leon Valley Commercial Large-Scale Retrofit Program for Multi-Family Complexes	# of Units	Estimated Average Cost Per Unit	Estimated Total Cost	Water Conserved Annually Per Unit (Gal)	Calculated Water Conserved Annually (Gal)	Calculated Water Conserved Annually (Ac-ft)	Calculated Cost Per Ac-Ft of Water Conserved Annually (Total Cost / Water Conserved Annually)	Projected 50% Annual Contribution to GW Trust (Ac-Ft)
Toilets & Plumbing Kits	644	\$110	\$70,840	23,450	15,101,800	46.35		23.17
Fixture Installation Costs	644	\$80	\$51,520	-	-	-	\$2,640	-
TOTALS	644	\$190	\$122,360	-	15,101,800	46.35	\$2,640	23.17

Note that of this \$122,360, \$70,840 would be paid to EAA’s plumbing fixture vendor for the high-efficiency plumbing fixtures and \$51,520 would be paid directly to the City of Leon Valley in reimbursement for the cost to contract for plumbing fixture installation.

Commercial/Industrial/Institutional Large-Scale Retrofit Program

Leon Valley management is also interested in working with their Economic Development Department to attract the participation of other Leon Valley businesses and industry in the Large-Scale Retrofit Program.

The City of Leon Valley would issue rebates of up to \$900 per acre-foot of water conserved annually or 50% of the cost of the retrofit (whichever is less), up to a total of \$150,000. The City would issue these rebates to Leon Valley commercial, industrial, and institutional customers that implement technological changes to alternative water-saving processes or equipment. The projected water conserved on an annually recurring basis is at least 166.67 acre-feet, which would result in at least 83.33 acre-feet to the Groundwater Trust, depending on the actual cost of the retrofits and resulting rebates. Refer to the following calculations.

$$\frac{\$150,000 \text{ in rebates}}{\text{max of } \$900/\text{acre-foot of water saved}} = 166.67+ \text{ acre-feet saved per year}$$

Projected 50% Annual Contribution to the Trust from the City of Leon Valley:

166.67+ acre-feet saved/year x 0.5 = **83.33+ acre-feet/year** Realized Water Savings to the Groundwater Trust

To implement this Plan, the Leon Valley Conservation Coordinator would partner with the Economic Development Department to contact high volume commercial/industrial/institutional customers such as those previously listed to inform them about the Large-Scale Retrofit Program and enlist their participation. Projects with the most efficient annual water savings would be given priority to maximize the total volume of water conserved through the Commercial Retrofit Program. Projects that have the lowest costs per acre-foot of water conserved would typically be those at hotels/motels, commercial laundries, car washes, and high-traffic restaurants. The Conservation Coordinator and WCTC staff would conduct cost and water savings analyses and submit summaries of proposed retrofit projects with recommendations to the EAA for their review and approval.

Once approved retrofit infrastructure and/or equipment has been installed and/or the alternative water-saving process is operational, and the new infrastructure/equipment/process is actively being utilized, the business owner would complete an Installation Certificate and submit it to the Conservation Coordinator. The Conservation Coordinator would review it and submit it to the EAA. Based on the project's cost analysis, the City of Leon Valley would then issue a one-time rebate of up to a maximum of \$900 per acre-foot of water saved annually, or 50% of the cost of the technological change, whichever is less.

Recommendation

The EAA provide up to \$150,000 for rebates for approved commercial, industrial, and/or institutional water conservation projects.

The City of Leon Valley issue rebates for approved and implemented large-scale retrofit projects to reduce commercial, industrial, and/or institutional Edwards Aquifer water consumption.

- ***The projected Realized Water Savings contributed annually to the Edwards Aquifer Groundwater Trust would be at least 83.33 acre-feet of water.***
- ***The cost per acre-foot of water conserved annually would be a maximum of \$900.***

**Table 3 – Commercial/Industrial/Institutional Large-Scale Retrofit Program
Budget and Projected Water Conserved**

Leon Valley Commercial/ Industrial/Institutional Large- Scale Retrofit Program	Total Rebates	Minimum Calculated Water Conserved Annually <small>(Retrofit Program Funding / Estimated Cost Per Ac-Ft of Water Conserved Annually)</small> (Ac-ft)	Maximum Estimated Cost Per Ac- Ft of Water Conserved Annually	Minimum Projected 50% Annual Contribution to GW Trust (Ac-Ft)
Rebates for Use of Water-Saving Processes or Equipment	\$150,000	166.67	\$900	83.33

Note that this \$150,000 would be paid directly to the City of Leon Valley in reimbursement for rebates issued under the Commercial/Industrial/Institutional Large-Scale Retrofit Program.

Reclaimed Water Program

As previously noted, the City of Leon Valley purchases reclaimed water from a nearby SAWS wastewater treatment plant for landscape irrigation at the City Complex and Raymond Rimkus Park. The City also encourages rainwater collection and use by their residential and business property owners for nonpotable uses such as landscape irrigation. On September 11, 2007, the City adopted a Rainwater Harvesting Systems Ordinance as part of their Construction and Plumbing Codes in their Building Regulations. The ordinance requires that rainwater collection systems and related equipment comply with state standards and be permitted, inspected, and approved by the City Plumbing Inspector. The ordinance also addresses rainwater system location and maintenance requirements.

Opportunities to Use Alternative Water Sources

City of Leon Valley staff have not pursued alternative water sources to the Edwards Aquifer but may do so in the future. The EAA may be able to assist the City with an alternative water source project at such a time.

RWCP Participation

Community Initiatives or Recommendations

The Leon Valley community has a long-standing commitment to environmental sustainability for the benefit of current citizens, the City's future, and generations to come. In Spring 2014, the City of Leon Valley will celebrate the 25th anniversary of its annual "Earthwise Living Day." There will be a water conservation exhibit in addition to other exhibits promoting composting and organic gardening, native plant gardening, and landscape xeriscaping (all of which also support water conservation), other environmental/conservation program exhibits, earth friendly product vendors and services, as well as a program of speakers. There will also be a Dallas band known as "Vocal Trash" at this year's event.

The Leon Valley City Council formally adopted an "El Verde By 2020" Resolution and Plan in 2007 that identifies four (4) sustainability goals, two (2) of which address water supply.³ In 2008, Leon Valley citizens submitted a successful proposal to the American Institute of Architects (AIA) to participate in its Sustainable Design Assessment Team (SDAT) program. According to AIA, the SDAT program provides an interdisciplinary assessment to assist communities in framing future policies or designing solutions based on sustainability principles and planning the first implementation steps.⁴ Multiple green programs and initiatives are a result of the Leon Valley SDAT program.

Leon Valley's participation in the EAHCP RWCP is a natural next step for the City. Leon Valley staff members were very responsive in providing the requested data and are ready to implement their RWCP.

High-Efficiency Plumbing Storage and Distribution Facilities

Leon Valley Public Works staff plan to have their plumbing contractors pick up the high-efficiency plumbing fixtures as they are needed for commercial retrofit projects, and therefore do not anticipate needing storage or distribution facilities. Leon Valley's Commercial Retrofit Program would have the luxury of operating this way because of the City's proximity to the EAA's plumbing fixture vendor's distribution centers.

Interest in Supporting RWCP Elements for Leon Valley Edwards Aquifer Exempt Well Users

According to the Edwards Aquifer Authority Act, “A well that produces 25,000 gallons of water a day or less for domestic or livestock use is exempt from metering requirements.” Such wells are known as exempt wells.⁵ Despite the urban/suburban location of Leon Valley, Public Works management estimate there are approximately 60 exempt wells in and around the City that use Edwards Aquifer water. The City is willing to take responsibility for administering the High-Efficiency Plumbing Program for Leon Valley Edwards Aquifer exempt well users. To qualify for free high-efficiency plumbing fixtures, Bexar County residents living in or near Leon Valley must currently use an Edwards Aquifer exempt well as their sole source for domestic water and register the well with the EAA, if it is not already registered.

Exempt Well User High-Efficiency Plumbing Program

The same high quality, high-efficiency plumbing fixtures would be available to qualified Leon Valley Edwards Aquifer exempt well users as would be used for the Commercial Retrofit Program for Multi-Family Complexes. The high-efficiency plumbing fixtures would be delivered to the EAA plumbing fixture vendor’s distribution center closest to Leon Valley and Leon Valley exempt well users would pick up the fixtures there. Leon Valley’s Exempt Well User High-Efficiency Plumbing Program would have the luxury of operating this way because of the City’s proximity to the EAA’s plumbing fixture vendor’s distribution centers. Recipients of free plumbing fixtures would be responsible for installing the fixtures themselves or paying a local plumber to install the fixtures.

Edwards Aquifer exempt well users receiving free fixtures must commit to replacing high-flow plumbing fixtures with these new high-efficiency fixtures within 60 days, leaving the new fixtures at the residence even if they move, and properly maintaining the new fixtures during their useful life. To better ensure exempt well users uphold these water conservation commitments, verification of high-efficiency plumbing fixture installation would be required. Once high-efficiency plumbing fixture installation has been completed, the exempt well user would complete an Installation Certificate and submit it with photograph(s) of the installed toilet(s) to the Leon Valley Conservation Coordinator. The Conservation Coordinator would review the package and submit it to the EAA.

To implement this Plan, the EAA would purchase and coordinate delivery of approximately 60 ultra low-flow toilets and high-efficiency plumbing kits to the Leon Valley area during the three-year program. Replacement of 60 high-flow plumbing fixtures with these high-efficiency fixtures would save a projected 4.32 acre-feet of water on an annually recurring basis (using the industry standard estimated water savings of 23,450 gallons per year per

toilet/showerhead/aerator retrofit previously noted), which is expected to provide 4.32 acre-feet to the Edwards Aquifer Groundwater Trust. Refer to the following calculations.

$$\frac{60 \text{ toilets \& plumbing kits distributed} \times (23,450 \text{ gallons/year})}{(325,851 \text{ gallons/acre-feet})} = 4.32 \text{ acre-feet saved per year}$$

Projected 100% Annual Contribution to the Trust from Leon Valley Exempt Well Users:

4.32 acre-feet/year Realized Water Savings to the Trust

Note that this 4.32 acre-feet of Realized Water Savings for the Groundwater Trust would not be included in the City of Leon Valley’s contracted commitment, since this conserved water is based on Installation Certificates completed by individual Edwards Aquifer exempt well users.

Recommendation

The EAA contract for purchase and delivery of approximately 60 ultra low-flow toilets and high-efficiency showerheads and aerators to Leon Valley over the three (3) years of the Program.

The City of Leon Valley distribute approximately 60 toilets and plumbing kits to qualified Leon Valley Edwards Aquifer exempt well users.

- *The estimated three-year cost for these plumbing fixtures and delivery to the Leon Valley area is \$6,600.*
- *The projected Realized Water Savings contributed annually to the Groundwater Trust by qualified well users in return is 4.32 acre-feet of water.*
- *The cost per acre-foot of water conserved annually is \$1,529.*

Table 4 – Exempt Well User High-Efficiency Plumbing Program Budget and Projected Water Conserved

Leon Valley Exempt Well User High-Efficiency Plumbing Program	# of Units	Estimated Average Cost Per Unit	Estimated Total Cost	Water Conserved Annually Per Unit (Gal)	Calculated Water Conserved Annually (Gal)	Calculated Water Conserved Annually (Ac-ft)	Calculated Cost Per Ac-Ft of Water Conserved Annually (Total Cost / Water Conserved Annually)	Projected 50% Annual Contribution to GW Trust (Ac-Ft)
Toilets & Plumbing Kits	60	\$110	\$6,600	23,450	1,407,000	4.32	\$1,529	4.32

Conclusions and Recommendations

The City of Leon Valley has a long-standing history of supporting sustainability and has made great strides in their efforts to eliminate water waste and use water more efficiently to reduce the City's water consumption, even in times of drought.

Following are the prioritized recommendations, cost projections, and projected water savings for the Leon Valley RWCP.

1. Leak Detection Program

The EAA reimburse the City of Leon Valley for the cost to contract for a citywide leak detection survey in return for **50.00 acre-feet** of water for the Edwards Aquifer Groundwater Trust on an annually recurring basis, at an estimated cost of **\$250** per acre-foot of water conserved annually and an estimated EAHCP cost of **\$25,000**.

2. Commercial, Industrial, and/or Institutional Large-Scale Retrofit Program

The EAA reimburse the City of Leon Valley for rebates issued for approved large-scale commercial, industrial, and/or institutional retrofit projects to result in at least **83.33 acre-feet** of water for the Groundwater Trust on an annually recurring basis, at a maximum estimated cost of **\$900** per acre-foot of water conserved annually and a three-year EAHCP cost of **\$150,000**.

3. Commercial Large-Scale Retrofit Program for Multi-Family Complexes

The EAA contract for purchase and delivery of an estimated 400 ultra low-flow toilets and high-efficiency showerheads and aerators and pay the installation costs, and the City of Leon Valley contract with local plumbers to install the toilets and plumbing kits. The Large-Scale Retrofit Program for Multi-Family Complexes is expected to result in **23.17 acre-feet** of water for the Groundwater Trust on an annually recurring basis, at an estimated cost of **\$2,640** per acre-foot of water conserved annually and an estimated three-year EAHCP cost of **\$122,360**.

4. Exempt Well User High-Efficiency Plumbing Program

The EAA contract for purchase and delivery of approximately 60 ultra low-flow toilets and high-efficiency showerheads and aerators and the City of Leon Valley distribute approximately 60 plumbing kits to qualified Leon Valley Edwards Aquifer exempt well users. The High-Efficiency Plumbing Program for Leon Valley Edwards Aquifer Exempt Well Users is expected to result in **4.32 acre-feet** of water for the Edwards Aquifer Groundwater Trust on an annually recurring basis, at an estimated cost of **\$1,529** per acre-foot of water conserved annually and a total estimated three-year cost of **\$6,600**.

The estimated total EAHCP cost of the Leon Valley RWCP would be **\$303,960**. This estimated total cost includes \$226,520 that would be paid directly to the City of Leon Valley in reimbursement for RWCP expenses, as well as an estimated \$77,440 that would be paid directly to the EAA plumbing fixture vendor for high-efficiency plumbing fixtures and delivery. Refer to Table 5 for a summary of the prioritized recommendations, cost projections, and projected water contributions to the Edwards Aquifer Groundwater Trust from the Leon Valley RWCP.

Table 5 – Prioritized Recommendations, Cost Projections, and Projected Water Contribution to the Edwards Aquifer Groundwater Trust from the Leon Valley RWCP

Prioritized Recommendations	Number of Plumbing Fixtures	Projected Three-Year Total Cost	Cost Per Ac-Ft of Water Conserved Annually (Three-Year Total Cost / Water Conserved Annually)	Projected Annual Contribution to Edwards Aquifer Groundwater Trust (Ac-Ft)
1. Leak Detection Program	-	\$25,000	\$250	50.00
2. Commercial/Industrial/Institutional Large-Scale Retrofit Program	-	\$150,000	\$900	83.33
3. Commercial Large-Scale Retrofit Program for Multi-Family Complexes	644	\$122,360	\$2,640	23.17
4. Exempt Well User High-Efficiency Plumbing Program	60	\$6,600	\$1,529	4.32
SUBTOTAL PAID DIRECTLY TO THE CITY OF LEON VALLEY		\$226,520		
SUBTOTAL PAID DIRECTLY TO THE PLUMBING VENDOR		\$77,440		
TOTALS	704	\$303,960	\$958	160.82

Table 6 summarizes the estimated complete cost to implement all components of the three-year Leon Valley RWCP and projected water conservation savings. Again, this estimated complete cost to implement all components of the Leon Valley RWCP includes both EAHCP funds that would be paid directly to the City of Leon Valley in reimbursement for program expenses, as well as estimated costs that would be paid directly to the EAA plumbing fixture vendor for high-efficiency plumbing fixtures and shipping. In return for the EAHCP RWCP funds and fixtures, the City of Leon Valley would commit fifty percent (50%) of their annual realized water savings resulting from the RWCP conservation activities outlined in this Plan to be held in the Edwards Aquifer Groundwater Trust for fifteen (15) years. When fully implemented, the three-year program is projected to result in total water savings of **317.33** acre-feet on an annually recurring basis. The City of Leon Valley’s projected annual Realized Water Savings contributed to the Groundwater Trust would be **156.51** acre-feet

of water. The annual Realized Water Savings contributed to the Groundwater Trust by Edwards Aquifer exempt well users is projected to be **4.32** acre-feet of water. The total annual Realized Water Savings contributed to the Groundwater Trust from implementation of the Leon Valley RWCP is therefore projected to be **160.82** acre-feet of water. The average cost per acre-foot of water conserved annually would be **\$958**.

Table 6 – Estimated Complete Cost to Implement the Leon Valley RWCP and Projected Water Conserved

Leon Valley Regional Water Conservation Program Component	Number of Units	Estimated Average Cost Per Unit	Estimated Three-Year Total Cost	Water Conserved Annually Per Unit (Gal)	Estimated or Calculated Water Conserved Annually (Gal)	Estimated or Calculated Water Conserved Annually (Ac-ft)	Calculated Cost Per Ac-Ft of Water Conserved Annually (Total Cost / Water Conserved Annually)	Projected 50% Annual Contribution to GW Trust from City of Leon Valley (Ac-Ft)	Projected 100% Annual Contribution to GW Trust from Leon Valley Exempt Well Users (Ac-Ft)
Leak Detection Program			\$25,000			100.00	\$250	50.00	-
Citywide Leak Detection Survey	-	-	\$25,000	-	32,585,100	100.00	-	50.00	-
Commercial Large-Scale Retrofit Program			\$272,360			213.01	\$1,279	106.51	-
Multi-Family Complexes - Toilets & Plumbing Kits	644	\$110	\$70,840	23,450	15,101,800	46.35	\$2,640	23.17	-
Multi-Family Complexes - Fixture Installation Costs	644	\$80	\$51,520	-	-	-	-	-	-
Rebates for Commercial Use of Water-Saving Processes or Equipment	-	-	\$150,000	-	54,308,500	166.67	\$900	83.33	-
Exempt Well User High-Efficiency Plumbing Program			\$6,600			4.32	\$1,529	-	4.32
Toilets & Plumbing Kits for Exempt Well Users	60	\$110	\$6,600	23,450	1,407,000	4.32	\$1,529	-	4.32
SUBTOTAL	City of Leon Valley's Projected Annual Contribution to GW Trust:							156.51	
SUBTOTAL	Leon Valley EA Exempt Well Users Projected Annual Trust Contribution:								4.32
TOTALS	704	-	\$303,960	-	103,402,400	317.33	\$958	160.82	

Definitions

1. **Covered Species** – Flora and fauna identified as threatened or endangered by the U.S. Fish and Wildlife Service under the authority of the Endangered Species Act.
2. **Edwards Aquifer Groundwater Trust** – Water that has been reserved and will not be pumped from the Edwards Aquifer in order to benefit spring flow levels that support the habitat of Covered Species.
3. **Edwards Aquifer Habitat Conservation Plan (EAHCP)** – The conservation plan prepared by the EAA, the City of San Marcos, Texas State University-San Marcos, the City of New Braunfels, and the San Antonio Water System, required by the Endangered Species Act, and submitted to and approved by the U.S. Fish and Wildlife Service as part of the application for an Incidental Take Permit.
4. **Edwards Aquifer Exempt Well** – A well that produces 25,000 gallons of Edwards Aquifer water a day or less for domestic or livestock use; such a well is exempt from metering requirements.
5. **Incidental Take Permit** – A permit issued by the U.S. Fish and Wildlife Service authorizing permit-holders to harm threatened or endangered species as a minor result in the course of conducting their routine and otherwise legal activities.
6. **Realized Water Savings** – Fifty percent (50%) of the water savings realized in one calendar year resulting from the activities undertaken as part of the EAHCP RWCP.
7. **Regional Water Conservation Program (RWCP)** – An EAHCP activity with the goal of annually conserving 20,000 acre-feet of permitted or exempt withdrawals of Edwards Aquifer water in areas throughout the Edwards Aquifer region to benefit spring flow levels and contribute to protection of Covered Species.

References

(In order cited in the Report)

1. *2008-2012 American Community Survey 5-Year Estimates*, based on data from the U.S. Census Bureau's Population Estimates Program, http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_12_5YR_DP04, accessed January 7, 2014.
2. *2011 Regional Water Plan, South Central Texas Regional Water Planning Area, Volume I*, September 2010, Appendix C, South Central Texas Regional Water Planning Group, San Antonio River Authority, HDR Engineering, Inc., Laura Raun Public Relations, Ximenes & Associates.
3. Leon Valley's "El Verde by 2020" Resolution and Plan, Resolution Number 07-019, November 5, 2007, accessed from Leon Valley's official website on December 5, 2013.
4. *Leon Valley, TX SDAT: El Verde by 2020. A Sustainable Design Assessment Team Final Report*, American Institute of Architects, accessed from Leon Valley's official website on December 5, 2013.
5. Edwards Aquifer Authority Act, edwardsaquifer.org.
6. Leon Valley's Groundwater Conservation Plan for Municipal Applicants to the EAA.
7. Leon Valley's 2012 Municipal Groundwater Conservation Plan Status Report to the EAA.
8. Leon Valley's official website, leonvalleytexas.gov.
9. Personal Communication, Leon Valley staff.

Appendix

Historical Water Use Summary by City

Data from TWDB Website, Except as Otherwise Noted

LEON VALLEY			
Year	Population	Annual Municipal Water Use (Acre- Feet)	Water Use Per Person Per Day (Gallons Per Capita Daily or GPCD)
1971	2,281	495	194
1972	2,655	534	180
1973	3,091	569	164
1974	3,598	611	152
1975	4,188	745	159
1976	4,875	792	145
1977	5,675	867	136
1978	6,606	1,239	167
1979	7,689	1,369	159
1980	8,951	1,632	163
1981	9,638	1,506	139
1982	9,911	1,772	160
1983	10,438	1,640	140
1984	10,995	2,003	163
1985	11,443	1,798	140
1986	11,910	1,880	141
1987	12,419	1,888	136
1988	12,950	2,122	146
1989	9,531	1,917	180
1990	9,581	1,715	160
1991	9,691	1,894	174
1992	9,877	1,973	178
1993	9,981	1,747	156
1994	10,151	1,581	139
1995	10,035	1,775	158
1996	10,296	1,948	169
1997	10,365	1,805	155
1998	10,412	1,714	147
1999	10,435	1,695	145
2000	9,239	1,118	108
2001	9,206	1,153	112
2002	9,166	1,817	177
2003	9,678	1,117	103
2004	9,396	1,059	101
2005	9,524	2,144	201
2006	9,489	1,812	170
2007	10,113	3,165	279
2008	10,417	1,302	112
2009	10,726	1,796	149
2010	10,151	1,558	137
2011	10,361	1,890	163
2012	10,676	1,590	133
2013	10,620	1,581	133

NOTE: All black text was added to this Texas Water Development Board (TWDB) Report by Texas A&M Water Conservation & Technology Center staff. Approximately 2/3 of the City of Leon Valley uses water provided by the Leon Valley Water System and 1/3 of the City uses water from the San Antonio Water System (SAWS). Data in this report are totals within the city limits and reflect the water use of both water systems' customers.

SOURCES: TWDB cited the 1971 to 2010 *Population* data as being from the Texas State Data Center and the 2011 Population estimate as being from the U.S. Census Bureau.

The 2012 *Population* data came from the County Information Project of the Texas Association of Counties and was cited as being from the Census Bureau.

The 2012 and 2013 *Municipal Water Use* was calculated from the Leon Valley Water System use as provided by Leon Valley Public Works staff, using the assumption that the City's system provides 2/3 of City water users with water; 2013 total City population was also provided by Public Works staff and corresponding GPCD was also calculated.

Average GPCD 1971-1997: 158
Average GPCD 1998-2012: 148

Average GPCD 1971-2013: 154