

July 2012

Wildes Manor

Water Conservation Plan

July 2012

Prepared for:

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Fallon, NV 89406-8972**

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Introduction

The water supply in Nevada is a precious commodity and plays an important role in determining Nevada's future. Nevada is the one of the driest states in the nation as well as one of the fastest growing. Nevada's future, both from an economic and a quality of life view, depends heavily upon the wise management of the water supply.

Groundwater, in general, provides about 40 percent of the total water supply used in Nevada. In some areas, groundwater provides the entire water supply. Groundwater usage may vary considerably from year-to-year as it is sometimes pumped to supplement surface water sources.

Water use in Nevada can be classified as:

- Domestic (household, both indoor and outdoor) – Met by public supply or private supply (e.g. wells).
- Commercial (businesses) – Met by public supply or private supply (e.g. non-community systems).
- Industrial (manufacturing/construction) – Met by public supply or private supply (e.g. non-community systems).
- Thermoelectric (electric/fossil fuel/geothermal power generation) – Met by public supply in a minor fraction.
- Mining (mining processes) – Supply source varies widely from operation to operation and is dependent upon the mineral being recovered and the recovery process employed.
- Irrigation (land use) – Met by self-supplied or supplied by irrigation companies or districts.
- Livestock (farm needs) – Supply source varies.

While all classifications of water usages have shown an increase over the years, it has historically been irrigation water use which has accounted for the majority of the water use in Nevada.

It has been estimated that the domestic water use accounts for less than 15 percent of the water used in Nevada, but this is expected to rise to nearly 25 percent as the population increases (based upon existing water use patterns and conservation measures). It is expected that Nevada's population will become increasingly concentrated in its primary urban areas of Las Vegas (Clark County), Reno/Sparks (Washoe County) and Carson City, with varied spillover effects on neighboring counties.

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It is vitally important that all residents understand the fundamental science of water, how it is managed in the state, and the issues affecting its management. Water education must become a priority and must include education of children as they are our future.

Because Nevada does not have a comprehensive state-wide conservation program, it is reliant upon the individual water suppliers for developing their own conservation programs. In 1991, Nevada enacted a law requiring adoption of conservation plans by water suppliers. Minimum standards for plumbing fixtures were adopted in 1991 (Assembly Bill 359) by Nevada and in 1992 minimum flow standards for plumbing fixtures were adopted by the federal government (National Energy and Policy Conservation Act).

Conservation is an essential part of ensuring adequate water supply as it is no longer feasible to develop new sources. It has proven to be a cost-effective way to reduce demands and/or to extend a given water supply. It can easily be pursued by all water users regardless of the water system type. Key to evaluating the program's effectiveness is the water use measurement (through meters and other measurement devices). Various conservation measures can be put into place and the achievement of the goals set with these measures is vital to combating the expected increase in water usage.

Statutory Requirements

This water conservation plan was prepared for **Wildes Manor** in accordance with Nevada Revised Statute (NRS) 540. As outlined in NRS 540.141, the provisions of this plan must include:

- a. Public Education
- b. Conservation Measures
- c. Water Management
- d. Contingency Plan
- e. Schedule
- f. Evaluation Measurements
- g. Conservation Estimates

In addition to the provisions of the water conservation plan, listed above, NRS 540.141 also requires a rate analysis to be performed and included with the submittal.

This plan is being submitted to the Nevada Department of Conservation and Natural Resources (DCNR), Division of Water Resources (DWR) for review and approval prior to its adoption by **Wildes Manor**, as required by NRS 540.131.

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This plan is also being submitted to the Public Utilities Commission of Nevada (PUCN) for review and approval prior to its adoption by **Wildes Manor**, as required by NRS 704.6662.

This plan is available for inspection during normal business hours at 980 Wildes Road Unit #18 Fallon, NV; this is the assistant manager's office.

This plan will conform to all public notice requirements as found in NRS 540 and NRS 118b Landlord and Tenant.

This is the first Water Conservation Plan **Wildes Manor** has developed.

In accordance with NRS 540.131, this plan will be reviewed from time-to-time to reflect changes and must be updated every five (5) years to comply with NRS 540.131 and NRS 540.141. The next update of this plan is to be on, or before, July 2017.

System Description

Wildes Manor is a privately owned residential community water system and has a current water operation permit, NV0000058. **Wildes Manor** serves water to 20 flat rate connections customers in its service area in Fallon which is located in Churchill County. The service area covers 1.83 acres with boundaries Wildes Road to the north, Harrigan to the east, private farm land to the south and private residences along Wildes Road to the west. The service area's terrain is flat.



The estimated population served in 2012 is 80, and **Wildes Manor** estimates that its customer base will increase by 0.0% on a yearly basis through 2020 because the park is fully developed. The State of Nevada, through its State Water Plan, estimates the population growth for Churchill County through 2020 to be 2.28% annually.

Water is supplied to **Wildes Manor** by pumping groundwater from the Carson Desert Basin (#101) of the Carson River Basin Hydrographic Region (#8). There is one (1) well supplying the system and one hydro-pneumatic pressure tank that holds 2500 gallons. Each of these is identified in the tables below (Table 1 and Table 2).

Table 1 – Source of Supply

Well No.	Depth (feet)	Production (gpm)
1	30	15

Table 2 – Hydro-pneumatic Tank

Tank No.	Volume (gallons)
1	2500

Wildes Manor has been granted no water rights.

Water is pumped from Well 1 through a sand filter and into the hydro-pneumatic tank. Due to the age of the park and changes in ownership the size of the distribution lines is unknown. Well 1 was drilled in May 1971 by Tom Hickman (NV Contractor’s License Number 10655, NV Driller’s License Number 621). The well was drilled to 38 feet, below ground surface (ft, bgs). The lithologic log shows top soil from 0 to 8 ft, bgs, sand from 8 to 12 ½ ft, bgs, clay from 12 ½ to 16 ½ ft, bgs, sand again from 16 ½ to 37 ft, bgs and clay from 37 to 38 ft, bgs. The well is sealed with grout and cement to 13 ½ ft, bgs, gravel packed from 13 ½ to 38 ft, bgs and has 1/8-inch perforated casing from 26 to 36 ft, bgs. A short duration pump test was run on the well at the time of drilling. The well was pumped at 40 gallons per minute (gpm) for 4 hours and showed 15 feet of drawdown displaying a specific capacity (pumping rate/drawdown) of 40 gpm/ 15 feet = 2.667 gpm/ft of drawdown.

Wildes Manor requires, at a minimum, a D1 operator.

The plant operator is required to perform monthly monitoring and testing of water quality. **Wildes Manor** has an outstanding water quality issue with high Arsenic levels which over the last 10 years have ranged from 17 to 19 ppb. **Wildes Manor** is currently investigating various treatment options.

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The last sanitary survey performed by the Nevada Department of Environmental Protection (NDEP) was completed on January 10, 2012 and shows seven deficiencies with the system of which five have been corrected. The two outstanding deficiencies are the MCL violation for Arsenic for which treatment options are being investigated and CCRs have been submitted on time for the past two years. These deficiencies were:

- 1) Operating without a certified operator;
- 2) Well does not have a watertight cover plate;
- 3) Well lacked an air vent;
- 4) System does not have and/or follow an approved site sample plan for Total Coliform Rule monitoring;
- 5) Monitoring violations for 2,4-D from 1/1/2008 through 12/31/2010 and Arsenic from 1/1/2010 through 3/31/2010
- 6) MCL violations for Arsenic from 1/1/11 through 9/30/11
- 7) CCR Report in 2009

Owner Rick Sparks passed the Distribution Operator Exam in June 2012 and is currently a Certified Grade 1 Distribution Operator. The cover plate on the well head is now watertight, and a vent has been properly installed on the well. **Wildes Manor** submitted a site sample plan in compliance with the Total Coliform Rule to the NDEP BSDW on July 26, 2012. They started complying with required monitoring for 2,4-D and Arsenic and the 2010 and 2011 CCRs were on time.

Wildes Manor does not charge specifically for water, but water system costs are included in the monthly space rental price.

Wastewater collected from the service area is handled with one local onsite septic tank.

Current rental rates were established in January 2009. Rental rates are reviewed every year.

Plan Provisions

In accordance with NRS 540.131, this plan will be reviewed from time-to-time to reflect changes and must be updated every five (5) years to comply with NRS 540.131 and NRS 540.141. The next update of this plan is to be on, or before, July 2017.

The **Wildes Manor** Owner and the Manager will oversee conservation efforts and will be responsible for implementation of conservation programs, monitoring of water use, and will review /revise the conservation plan when needed.

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In an effort to promote voluntary conservation and aid in Nevada's future, Wildes Manor will enact the voluntary conservation measures found in the **Conservation Measures** section. When more stringent measures are needed, Wildes Manor will enact the measures found in the **Contingency Measures** section. All measures can be found in Appendix A.

As required by NRS 540.141, the water conservation plan must include the following provisions:

- a. Public Education
- b. Conservation Measures
- c. Water Management
- d. Contingency Plan
- e. Schedule
- f. Evaluation Measures
- g. Conservation Estimates

Each provision is discussed below.

Public Education

Public education is a key for cooperation with conservation efforts, so funding for public education is crucial. **Wildes Manor** recognizes this and works with residents regarding conservation efforts.

It is the goal of **Wildes Manor** to increase public awareness to conserve water, encourage reduction in lawn sizes, promote the use of climate-appropriate plants, encourage the use of drip irrigation, and support conscientious decisions for water use.

Conservation education may include education materials such as bill inserts, pamphlets, flyers, and posters. New customers will be provided these materials when service is established, while existing customers will receive these materials periodically through bill inserts or direct mail. Conservation information will be provided to all customers upon request and should include an explanation of all costs involved in supplying drinking water which is included in the monthly rent. This will also demonstrate how the water conservation practices will provide residents with long-term savings. Education materials should also encourage reduction of lawn sizes, use of drip irrigation, use of climate-appropriate plants, and conservation tips and techniques (see Appendix B).

Customers should understand that they pay for their water use through their monthly rent, and that water conservation is beneficial to the entire community to keep rental costs down.

Every fall (approximately late September) residents are notified in writing to winterize their swamp coolers and pipes to prevent freezing and subsequent breaks and leaks. Approximately

two weeks after written notification the **Wildes Manor** Manager visits each of the twenty residential units to verify each unit has been winterized. This visit can also serve as an opportunity to identify leaks within each residential unit and encourage residents to fix internal leaks.

Conservation Measures

In an effort to promote conservation and voluntarily conserve water, **Wildes Manor** is adopting water-use regulations to promote water conservation during non-emergency situations. These regulations include the following non-essential water use:

- 1) Use of water through any connection when **Wildes Manor** has notified the customer in writing to repair a broken or defective plumbing, sprinkler, watering or irrigation system and the customer has failed to make such repairs within 5 days after receipt of such notice.
- 2) Use of water which results in flooding or run-off in gutters, waterways, patios, driveway, or streets.
- 3) Watering of plants, lawn, landscape, and turf areas are prohibited between the hours of **12:00 p.m. to 5:00 p.m.**
- 4) Use of water for watering outside plants and turf areas using a hand-held hose without a positive shut-off valve.
- 5) Use of water for the filling or refilling of swimming pools with the exception of small children's pools.

In the event these conservation measures are insufficient to control the water shortage, **Wildes Manor** may wish to implement the mandatory measures discussed in the ***Contingency Plan*** section below.

Wildes Manor also promotes the development of water conserving principles into any future development if the park were to undergo future renovations. Customers are encouraged to consult with local nurseries or perform an internet search on the availability of water conservation plants. Customers are also encouraged to evaluate irrigation management systems using metering, timing, and water sensing devices.

At present, it is not viable to offer any water conservation incentives. **Wildes Manor** does encourage residents to fix leaks promptly and turns off water service immediately when large leaks are identified.

Water Management

Wildes Manor monitors the hydro-pneumatic tank once a week and adds air as necessary to pressurize the tank to maintain water pressure between 40 to 50 psi. Working relationships with other local water purveyors are not maintained to ensure adequate water supplies are available. **Wildes Manor** is not inter-tied with any other water systems.

Wildes Manor does not actively monitor unaccounted for water losses because customers are not metered and there is no comparison to be made between production and customer usage. **Wildes Manor** does monitor electricity use to identify large leaks within the system. **Wildes Manor** does not plan to install individual water meters on each of its customers at this time. The operator can estimate usage based on the small population of the park and average domestic water use of 151 to 200 gallons per person per day according to USGS data from 2005 (EPA, 2012¹). When the owner or manager notices leaks within the public system they are addressed immediately. When residents have leaks they are notified verbally by the **Wildes Manor** Manager and given 5 days to fix the leak. Historically, **Wildes Manor** has turned off water as soon as the leak was detected when leaks are so large that they are noticed to encourage residents to fix leaks promptly as well as to safeguard the public water system and water quality. All residents own their mobile homes; therefore it is the responsibility of residents to fix all leaks on their side of the water system. **Wildes Manor** is in the process of implementing an annual leak detection program using leak detection correlation equipment with the assistance of Nevada Rural Water Association to reduce water loss through leakage.

Each spring **Wildes Manor** plans to visit each resident to identify leaks on the resident's side of the water system where winterization was not successful. The **Wildes Manor** Manager and Owner will help residents fix leaks whenever possible, but all expenses associated with leaks will be paid by the owner/resident of the mobile home. Visits will be made again each fall approximately two weeks after residents have been notified to winterize their properties.

Wildes Manor does not have a formal well head protection program, but the well is secured with a tight well cap.

Residents are not metered and there are no plans to implement individual meters because water system costs are included in the monthly space rental. The park was purchased from the previous owner with the water system "as is" without meters. Because of the small nature of the park and minimal irrigation and water use, metering has not been deemed necessary at this point.

A capital improvement plan is in place in the form of a recently conducted Preliminary Engineering Report (PER). The plan is not currently being funded through rates, and there are no plans to replace distribution lines at their anticipated useful life. The PER provides four

¹ http://www.epa.gov/watersense/our_water/tomorrow_beyond.html

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options to mitigate the high Arsenic levels in the groundwater. The PER also includes a recommendation to drill a new well, but does not include replacing any system mains. Because the system is privately owned, water system expenses are funded by the Owner.

Wildes Manor does not have a system for reusing of effluent. Effluent is managed with one large septic tank and a leach field which are maintained on the property.

Churchill County has adopted the International Plumbing Code which applies to structures which are renovated as well as all new construction under Title 14 Chapter 12 (Bill 2006-N). The Churchill County Building Department checks new construction, renovation, and expansions within Churchill County to ensure compliance with this ordinance.

Contingency Plan

The objective of the contingency plan would be to manage the available resources to ensure continued supply of potable water during periods of drought or extended drought.

It is envisioned that voluntary conservation will be sufficient to ensure an adequate supply of water and reduce water usage. However, if a sustained drought (lack of precipitation) is encountered, it may be necessary to implement mandatory restrictions in order to ensure an adequate supply of water to meet essential needs.

Wildes Manor plans for drought response would be three (3) stages of drought response:

- (1) Drought Watch,
- (2) Alert stage, and
- (3) Emergency stage.

This is based upon the State of Nevada Drought Response. The stages are describes as follows:

In Stage 1, the Drought Watch, **Wildes Manor** would increase monitoring of its water supplies and begin creating public awareness of the water supply situation and the need to conserve. Conservation measures at this stage would be voluntary. Retrofit kits (low-flow faucet aerators, low-flow showerheads, leak detection tablets, and replacement flapper valves) can be made available, or at cost, and can be actively distributed, if needed.

In Stage 2, the alert stage, **Wildes Manor** would call for wide-based community support to achieve conservation, implement water use restrictions and impose penalties for ignoring the restrictions. Conservation measures at this stage would be mandatory and violations would incur fines.

In Stage 3, the emergency stage, **Wildes Manor** would declare a drought and water shortage emergency, would enforce water use restrictions, and impose fines for violations. Media relations would be activated in order to inform the customers and monetary assistance may need to be secured in an effort to mitigate the effects of the drought (e.g. federal funding assistance).

When a drought is declared over, voluntary conservation measures (see **Conservation Measures** section) will be reinstated and water supplies would continue to be monitored.

Schedule

All of the provisions listed will be in place once this plan has been approved but many of these are currently in place and are actively working to achieve results.

Evaluation Measurements

Because individual customers are not currently metered, it is impossible to determine the effectiveness of each plan element on an individual customer basis. However, **Wildes Manor** can evaluate the effectiveness of each plan element from the perspective of the whole system. In that regard, as a plan element is activated (e.g. mailing literature or declaring a drought stage), production figures will be compared to same-month historical data to estimate the plan element's effectiveness. This information will be utilized as a basis for any future water conservation plan revision and plan elements. At the moment **Wildes Manor** does not have a production meter in place but is in the process of investigating various funding options for system upgrades. **Wildes Manor** will also monitor electricity use to evaluate the effectiveness of the conservation measures.

If there is a decrease in production as a result of a particular measure/incentive, that measure/incentive can be expanded or improved upon, if possible. If it is discovered that a particular measure/incentive is ineffective, it will be discontinued and a new measure can then be implemented to take its place.

In addition to changes resulting from audits, updates, and modifications to conservation measures/incentives there will be changes made to meet changing conditions (e.g. customer growth and demand, changing use, new technologies, etc.).

Conservation Estimates

Public education can be expected to provide a **5%** reduction in water use.

During the Stage 1 phase of the conservation plan, it is estimated that conservation measures could be expected to provide a **5 to 7.5 %** reduction in water use.

During the Stage 2 phase of the conservation plan, it is estimated that conservation measures could be expected to provide a **7.5 to 10 %** reduction in water use.

During the Stage 3 phase of the conservation plan, it is estimated that conservation measures could be expected to provide a **10 to 12.5%** reduction in water use.

It is to be noted that there are no large lawns and non-essential water use in general is already at a minimum in the community.

The estimated water savings for various end-user efforts can be found in Appendix C.

Rate Analysis

At this time **Wildes Manor** does not anticipate any further water conservation savings due to a change in rate structure because individual units are not metered. **Wildes Manor** does not have the funds necessary to meter individual customers and cannot charge variable rates based upon usage. **Wildes Manor** will continue to monitor the electricity use and water usage once the production meter is in place and will re-visit this issue each time rates are reviewed. If so warranted, a change in rates will occur and this conservation plan will be updated to reflect the new rates.

APPENDICES

APPENDIX A: CONSERVATION MEASURES

Stage 1 – Drought Watch

1. Wildes Manor would increase monitoring of water supplies.
2. Wildes Manor would begin creating public awareness of the water supply situation and the need to conserve. The Wildes Manor Manager and/or/Owner will visit each of the twenty residential units personally to make them aware that they have entered the drought watch stage.
3. Wildes Manor would inform customers of voluntary conservation measures (non-essential water uses, listed below).
4. Wildes Manor would provide customers with retrofit kits either at cost or free.

Non-essential water uses are:

- 1) Use of water through any connection when Wildes Manor has notified the customer in writing to repair a broken or defective plumbing, sprinkler, watering or irrigation system and the customer has failed to make such repairs within 5 days after receipt of such notice.
- 2) Use of water which results in flooding or run-off in gutters, waterways, patios, driveway, or streets.
- 3) Watering of plants, lawn, landscape, and turf areas are prohibited between the hours of **12:00 p.m.** to **5:00 p.m.**
- 4) Use of water for watering outside plants and turf areas using a hand-held hose without a positive shut-off valve.
- 5) Use of water for the filling or refilling of swimming pools with the exception of small children's pools.

Stage 2 – Alert Stage

1. Wildes Manor would set conservation goals and call for wide-based community support to achieve those goals.
2. Wildes Manor would inform customers in person of mandatory conservation measures (non-essential water uses, listed in Stage 1 are now mandatory).
3. Wildes Manor would inform customers of penalties if mandatory conservation measures are not observed (penalties are listed below).
4. Wildes Manor would inform customers of mandatory conservation water fees.
5. Wildes Manor limit the use of fire hydrants to fire protection uses only (within the park there are no fire hydrants, but Churchill County has hydrants nearby).
6. Wildes Manor would provide customers with retrofit kits either at cost or free.
7. In addition to the non-essential water uses listed in Stage 1 residents are not permitted to use water for any sort of irrigation of lawns and gardens or to fill swimming pools of any type including baby pools.

Penalties for violation of mandatory conservation measures are:

- 1st violation – written warning would the Manager and/or Owner.
- 2nd violation – **\$ 10.00**
- 3rd violation – **\$ 30.00**
- 4th violation – turn-off of water services.

Offenses for separate water use restriction violations will each start at the Drought Watch (1st violation) and the penalties for the offenses are in addition to the regular rate schedule charges.

Stage 3 – Emergency Stage

1. Wildes Manor would declare a drought and water shortage emergency.
2. Wildes Manor would inform customers of prohibited water uses (non-essential water uses, listed in Stage 1 are now prohibited).
3. In addition to the non-essential water uses listed in Stage 1 residents are not permitted to use water for any sort of irrigation of lawns and gardens or to fill swimming pools of any type including baby pools.
4. Wildes Manor would inform customers of penalties if prohibited measures are not observed (penalties are listed below).
5. Wildes Manor would limit the use of fire hydrants to fire protection uses only (within the park there are no fire hydrants, but Churchill County has hydrants nearby).
6. Wildes Manor would provide customers with retrofit kits either at cost or free.
7. Wildes Manor would seek monetary assistance in an effort to mitigate the drought (e.g. federal funding).

Penalties for violation of prohibited water use measures are:

1st violation – written warning.

2nd violation – **\$ 75.00**

3rd violation – turn-off of water services.

Offenses for separate water use restriction violations will each start at the Drought Watch (1st violation) and the penalties for the offenses are in addition to the regular rate schedule charges.

APPENDIX B: PUBLIC EDUCATION MATERIALS

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There are several publications available for use at U.S. EPA website for general distribution (currently located at <http://epa.gov/watersense/pubs/index.htm#ideas>). These publications include such topics as:

- Simple Steps to Save Water,
- Ideas for Residences,
- Using Water Wisely In the Home,
- Outdoor Water Use in the US,
- Toilet Flush Facts,
- Watering Can Be Efficient,
- Irrigation Timers for the Homeowner, and
- Water Efficient Landscaping,

These publications can be utilized until Wildes Manor develops system-specific publications.

There are also numerous website that provide tips for conserving water. One of these is: <http://www.wateruseitwisely.com/100-ways-to-conserve/index.php>. Customers can be directed to this website for tips to conserve water.

Specific tips for landscaping that can be provided to the customers are listed below. During drought conditions outdoor watering restrictions may be imposed, and therefore some of the following tips will not apply.

Tips for Landscaping

Watering:

- Detect and repair all leaks in irrigation systems.
- Use properly treated wastewater for irrigation where available.
- Water the lawn or garden during the coolest part of the day (early morning is best). Do not water on windy days.
- Water trees and shrubs, which have deep root systems, longer and less frequently than shallow-rooted plants which require smaller amounts of water more often. Check with the local nursery for advice on the amount and frequency of watering needed in your area.
- Set sprinklers to water the lawn or garden only—not the street or sidewalk.
- Use soaker hoses and trickle irrigation systems.
- Install moisture sensors on sprinkler systems.

Planting:

- Have your soil tested for nutrient content and add organic matter if needed. Good soil absorbs and retains water better.
- Minimize turf areas and use native grasses.
- Use native plants in your landscape—they require less care and water than ornamental varieties.
- Add compost or peat moss to soil to improve its water-holding capacity.

Maintaining:

- Use mulch around shrubs and garden plants to reduce evaporation from the soil surface and cut down on weed growth.
- Remove thatch and aerate turf to encourage movement of water to the root zone.
- Raise your lawn mower cutting height to cut grass no shorter than three inches—longer grass blades encourages deeper roots, help shade soil, cut down on evaporation, and inhibit weed growth.
- Minimize or eliminate fertilizing which requires additional watering, and promotes new growth which will also need additional watering.

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Ornamental Water Features:

Do not install or use ornamental water features unless they recycle the water. Use signs to indicate that water is recycled. Do not operate during a drought.

APPENDIX C: END-USER WATER SAVINGS

Here are just a few of the end-user water savings that could be realized:

Leaky Faucets

Issue: Leaky faucets that drip at the rate of one drip per second can waste more than 3,000 gallons of water each year.

Fix: If you're unsure whether you have a leak, read your water meter before and after a two-hour period when no water is being used. If the meter does not read exactly the same, you probably have a leak.

Leaky Toilets

Issue: A leaky toilet can waste about 200 gallons of water every day.

Fix: To tell if your toilet has a leak, place a drop of food coloring in the tank; if the color shows in the bowl without flushing, you have a leak.

Showering

Issue: A full bath tub requires about 70 gallons of water, while taking a five-minute shower uses 10 to 25 gallons.

Fix: If you take a bath, stopper the drain immediately and adjust the temperature as you fill the tub.

Brushing Teeth Wisely

Issue: The average bathroom faucet flows at a rate of two gallons per minute.

Fix: Turning off the tap while brushing your teeth in the morning and at bedtime can save up to 8 gallons of water per day, which equals 240 gallons a month!

Watering Wisely

Issue: The typical single-family suburban household uses at least 30 percent of their water outdoors for irrigation. Some experts estimate that more than 50 percent of landscape water use goes to waste due to evaporation or runoff caused by overwatering.

Fix: Drip irrigation systems use between 20 to 50 percent less water than conventional in-ground sprinkler systems. They are also much more efficient than conventional sprinklers because no water is lost to wind, runoff, and evaporation. If the in-ground system uses 100,000 gallons annually, you could potentially save more than 200,000 gallons over the lifetime of a drip irrigation system should you choose to install it. That adds up to savings of at least \$1,150!

Washing Wisely

Issue: The average washing machine uses about 41 gallons of water per load.

Fix: High-efficiency washing machines use less than 28 gallons of water per load. To achieve even greater savings, wash only full loads of laundry or use the appropriate load size selection on the washing machine.

Flushing Wisely

Issue: If your toilet is from 1992 or earlier, you probably have an inefficient model that uses at least 3.5 gallons per flush.

Fix: New and improved high-efficiency models use less than 1.3 gallons per flush—that's at least 60 percent less than their older, less efficient counterparts. Compared to a 3.5 gallons per flush toilet, a WaterSense labeled toilet could save a family of four more than \$90 annually on their water bill, and \$2,000 over the lifetime of the toilet.

Dish Washing Wisely

Issue: Running dishwasher partial full and pre-rinsing dishes before loading the dishwasher.

Fix: Run the dishwasher only when it's full and use the rinse-and-hold dishwasher feature until you're ready to run a full load. Pre-rinsing dishes does not improve cleaning and skipping this step can save you as much as 20 gallons per load, or 6,500 gallons per year. New water-saver dishwashers use only about 4 gallons per wash.

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Estimated water savings from EPA Water Conservation Guidelines 1998 (Appendix B, Table B-1):

Type	Estimated Usage (gpcpd)	Conservation Usage (gpcpd)	Savings (gpcpd)	Savings (%)
Toilet	18.3	10.4	7.9	43 %
Clothes Washers	14.9	10.5	4.4	30 %
Showers	12.2	10.0	2.2	18 %
Faucets	10.3	10.0	.3	3 %
Leaks	6.6	1.5	5.1	77 %

Benchmarks from selected conservation measures from EPA Water Conservation Guidelines 1998 (Appendix B, Table B-4):

Category	Measure	Reduction of End Use (% or gpcpd)
Universal metering	Connection metering	20 %
	Sub metering	20 – 40 %
Costing and pricing	10% increase in residential prices	2 – 4 %
	10% increase in non-residential prices	5 – 8 %
	Increasing-block rate	5 %
Information and education	Public education and behavior changes	2 – 5 %
End-use audits	General industrial water conservation	10 – 20 %
	Outdoor residential use	5 – 10 %
	Large landscape water audit	10 – 20 %
Retrofits	Toilet tank displacement devices (for toilets using > 3.5 gallons/flush)	2 – 3 gpcpd
	Toilet retrofit	8 – 14 gpcpd
	Showerhead retrofit (aerator)	4 gpcpd
	Faucet retrofit (aerator)	5 gpcpd
	Fixture leak repair	0.5 gpcpd
	Governmental building (indoors)	5 %
	Pressure management	Pressure reduction, system
Outdoor water use efficiency	Pressure-reducing valves, residential	5 – 30%
	Low water-use plants	7.5 %
	Lawn watering guides	15 – 20 %
	Large landscape management	10 – 25%
Replacements and promotions	Irrigation timer	10 gpcpd
	Toilet replacement, residential	16 – 20 gpcpd
	Toilet replacement, commercial	16 – 20 gpcpd
	Showerhead replacement	8.1 gpcpd
	Faucet replacement	6.4 gpcpd
	Clothes washers, residential	4 – 12 gpcpd
	Dishwashers, residential	1 gpcpd
Water-use regulation	Hot water demand units	10 gpcpd
	Landscape requirements for new developments	10 – 20 % in sector
	Greywater reuse, residential	20 – 30 gpcpd

