

Dayton Valley Water System
Permit # NV0000032

Water Conservation Plan
July 8, 2010

Prepared for:

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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 ones. 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 the Dayton Valley 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).
- 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 either self-supplied or public supplied systems.
- 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 the Dayton Valley.

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.

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 conservations 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 the Dayton Valley Water System 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 the Dayton Valley Water System, as required by NRS 540.131.

This plan is available for inspection during normal business hours at the Lyon County Utilities Department, 34 Lakes Blvd., Ste. 103, Dayton, NV.

This plan will conform to all public notice requirements as found in NRS 540.

The last Water Conservation Plan for the Dayton Valley Water System was approved by DWR on July 7, 2005. This plan revises the previously approved plan.

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 8, 2015.

System Description

The Dayton Valley Water System is a publically-owned combined community water system and has a current water operation permit, NV 0000032. The Dayton Valley Water System serves water to approximately 6,122 metered-rate customers in its service areas of Dayton, Mound House, and vicinity, which is located in Lyon County. The service area boundaries are the Carson City/Lyon County boundary to the west and the Ten-Mile Hill (Chaves Road) to the east and covers approximately 33 square miles. The service area's terrain is mainly flat in nature in the valley areas surrounded by mountains.

The estimated population served in 2009 was 13,850 people. The Dayton Valley Water System estimates that its customer base will increase by 1.5% on a yearly basis through 2020. The State of Nevada, through its State Water Plan, estimates the population growth for Lyon County through 2020 to be 2.79% annually.

The water supply is from groundwater that is not under the direct influence of surface water (e.g. protected wells) and no surface water or groundwater under the influence of surface water sources. The groundwater is located within the Dayton Valley Basin #103, Segments 7A, 7B and 7C of the Carson River as created in the Alpine Decree. There are a total of 11 wells supplying the system and a total of 13 storage tanks. Each of these is identified in the tables below (Table 1 and Table 2). The Dayton Valley Water System is permitted to supply water under a conjunctive use program which allows us to use both ground and surface water.

Table 1 – Source of Supply

Well No.	Depth (feet)	Production (gpm)
D1 (Dayton)	180	100
D2 (Dayton)	360	200
D3 (Dayton)	450	800
D4 (Dayton)	294	750
RP5 (Rose Peak)	300	820
RP6 (Rose Peak)	70	90
RP7 (Rose Peak)	123	70
8 (Cardelli)	610	1,000
DVE9 (Dayton Valley Estates)	178	360
MH12 (Mound House)	222	42
20 (Rolling A)	128	900
TOTAL		5,132

Table 2 – Storage Tanks

Tank No.	Volume (gallons)
Lower Booster Tank	40,000
Upper Booster Tank	1,000,000
Eldorado Tank	1,300,000
Mound House Tank #1	500,000
Mound House Tank #2	1,000,000
Linehan Tank	100,000
Grindstone Tank	654,000
Dayton Valley Estates Tank #1	179,000
Dayton Valley Estates Tank #2	450,000
Rose Peak Tank	1,100,000
Six Mile Canyon Tank	2,000,000
Santa Maria Tank	500,000
Carson City Hwy 50 East Tank	3,000,000
TOTAL	11,823,000

Dayton Valley Water System has been granted water rights in the total amount of 11,449 Acre-Feet (AF) per year (9,297 AF is groundwater and 2,152 AF is surface water).

Water is pumped from groundwater wells through the distribution system and/or booster stations to the various storage tanks. The entire system is controlled through a SCADA system. Sodium Hypochlorite is injected at each well site for disinfection. On-site chlorine generators are in the process of being installed at three (3) sites. Water is then distributed to the customers through a distribution network that ranges in size from 6-inch to 14-inch. Pipe type includes C900, Ductile Iron, AC, and Steel. The Dayton Valley Water System is inter-connected to the Carson City Water System via a 16-inch Ductile Iron pipeline.

Dayton Valley Water System requires, at a minimum, a Water Distribution and Treatment Grade III operator. All Dayton Valley Water System technicians hold both Distribution and Treatment certification ranging from Grade I to Grade V.

Dayton Valley Water System technicians are required to perform monthly, quarterly, and yearly monitoring of water quality. The Dayton Valley Water System does not currently have any outstanding water quality issues.

The last sanitary survey performed by the Nevada Department of Environmental Protection (NDEP) was completed on November 2, 2006 and had 17 deficiencies with the system. Four deficiencies are still outstanding and they are:

1. W10 – Well 10. SRC WL Flooding Protection; The well is not protected from surface water runoff or is below the level of the 100 year flood. NAC 445A.66865. *Comments: Area is prone to flooding.*

2. Six Mile Tank. Sampling taps should be smooth bore rather than threaded.
3. W08 – Well 8. SRC WL Vandalism or Tampering; The well is not adequately protected from vandalism or tampering. NAC 445A.66975. *Comments: Cover main power switch on outside of building.*
4. W01 – Well 1. SRC WL Vent Pipe Height and Screen; The well casing is not equipped with a vent pipe, pipe height is not adequate, properly oriented or screened. NAC 445A.6692. *Comments: No vent on Well 1; pump displays significant vibration.*

Dayton Valley Water System charges all its customers a uniform rate structure. All customers pay a flat rate for the first 5,000 gallons of water utilized (the rate is dependent upon the meter size) and a volume charge for each additional 1,000 gallons of water utilized. It does not have a tiered rate usage fee. The fees are detailed in the table below (Table 3).

Table 3 –Customers and Usage Charges

Meter Type and Size	Number of Meters	Monthly Flat Rate Fee (1st 5,000 gallons)	Volume Charge (\$/1,000 gallon)
Residential Customers			
3/4-inch or less	4,686	\$23.00	\$2.83
1-inch	2	\$31.17	\$2.83
1-1/2-inch	0	\$44.73	\$2.83
2-inch	0	\$61.02	\$2.83
3-inch	0	\$104.42	\$2.83
4-inch	0	\$153.26	\$2.83
6-inch	0	\$174.90	\$2.83
8-inch	0	\$220.92	\$2.83
Commercial Customers			
3/4-inch or less	470	\$23.00	\$2.83
1-inch	79	\$31.17	\$2.83
1-1/2-inch	53	\$44.73	\$2.83
2-inch	50	\$61.02	\$2.83
3-inch	7	\$104.42	\$2.83
4-inch	1	\$153.26	\$2.83
6-inch	0	\$174.90	\$2.83
8-inch	0	\$220.92	\$2.83

Wastewater collected from the service area is treated at the Rolling A Wastewater Treatment Plant and effluent is used to supply the Dayton Valley Golf Course in the amount of 600,000 gallons per day. It is anticipated that the effluent used will increase and will reach roughly 1,150,000 gallons per day, which will include not only the golf course usage but also additional

landscape, irrigation, and construction usages. Dayton Valley Water System will begin charging for effluent in 2013.

Current water rates were established on July 1, 2006. Water rates are reviewed every 5 years.

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 8, 2015.

Dayton Valley Water System may appoint a staff member, if economically feasible to do so, to oversee the conservation efforts and this staff member will be responsible for implementation of conservation programs, monitoring of water use, and will review/revise the conservation plan when needed.

In January 2007, Lyon County adopted a Water Conservation Ordinance (currently found as Title 9, Chapter 3, and Section 9.03.16). This water conservation plan is intended to reflect that ordinance and if ordinance changes occur, then this conservation plan will be revised to reflect those changes.

In an effort to encourage conservation and aid in Nevada's future, the Dayton Valley Water System will enact the conservation measures found in the *Conservation Measures* section. When more stringent measures are needed, the Dayton Valley Water System will enact the measures found in the *Contingency Measures* section.

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. The Dayton Valley Water System participates in local events such as Dayton Valley Days, a popular and well attended event. Water conservation, source water

Protection, and well head protection are featured at this event. Promotional material related to conservation is sent out in water bills, posted at Lyon County offices and is handed out to walk – in customers. Funding for all conservation and source water programs comes from the operating budget or through grants. Lyon County Utility staff has developed a source water related educational program for fifth grade classes which is presented at the local elementary schools.

It is the goal of the Dayton Valley Water System to increase public awareness to conserve water, encourage reduction in lawn sizes, encourage the use of climate-appropriate plants, encourage the use of drip irrigation, and encourage conscious decisions for water use. The Dayton Valley Water System, through the Carson Water Subconservancy District, also offers free residential/landscaping water audits which are invaluable in locating inefficiencies in residential/landscaping water systems including leaks, inefficient fixtures/appliances, and poor water use habits. Appendix A describes typical publications that are available for general distribution.

Water bills are easily understood and informative, going beyond the basic billing information. Bills do include comparisons to previous bills over the last 12 months. Bill inserts also include tips on water conservation that can help customers make informed choices about their water usage.

The Dayton Valley Water System may also establish a water conservation advisory committee that would involve the public in the conservation process and provide feedback to the system concerning its efforts, thus fostering support for conservation in the community.

Conservation Measures

In an effort to encourage conservation, Lyon County has adopted water-use regulations to promote water conservation both during non-emergency and emergency situations. The water use regulations can be found in the Lyon County Code Section 9.03.16.

The Dayton Valley Water System routinely enforces conservation efforts by restricting water use from June 1 to October 1 every year. Restrictions can include the following non-essential water use:

- 1) Use of water through any connection when the Dayton Valley Water System 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 on impervious surfaces or on to other property that may cause damage.
- 3) Use of water for washing aircraft, cars, buses, boats, trailers or other vehicles without a positive shut-off nozzle on the outlet end of the hose.
- 4) Use of water for watering streets with trucks, except for initial wash-down for construction purposes (if street sweeping is not feasible), or to protect the health and safety of the public.

- 5) Use of water for construction purposes, such as consolidation of backfill, dust control, or other uses unless no other source of water or other method can be used.
- 6) Use of water for more than minimal landscaping in connection with any new construction.
- 7) Use of water for outside plants, lawn, landscape, and turf areas with even numbered addresses watering on even numbered calendar days and odd numbered addresses watering on odd-numbered calendar days.
- 8) Watering of plants, lawn, landscape, and turf areas are prohibited between the hours of 10 a.m. and 6 p.m.
- 9) Watering is prohibited on the 31st day of the month.
- 10) Watering is prohibited when conditions are windy.
- 11) Use of water for watering outside plants and turf areas using a hand-held hose without a positive shut-off valve.
- 12) Use of water for decorative fountains or the filling or topping off of decorative lakes or ponds. Exceptions are made for those decorative fountains, lakes, or ponds which utilize recycled water.
- 13) Use of water for the filling or refilling of swimming pools.
- 14) Service of water by any restaurant except upon the request of the patron.

Exceptions to these restrictions can occur under the following conditions:

- 1) Washing vehicles at commercial or fleet vehicle washing facilities operated at fixed locations where equipment using water is properly maintained to avoid wasteful use.
- 2) Nevada licensed commercial gardeners, or caretakers, who are on the premises at the time the watering is taking place.
- 3) Vegetable gardens, flowerbeds, and trees within two (2) months of planting.
- 4) New lawns, including sod, for twenty-one (21) days from planting/installing date that have been planted prior to June 15 or after August 15.
- 5) Complexes which file for, and receive approval of, an irrigation plan.
- 6) Residential customers adjusting/repairing their irrigation system during the restricted water times for a time period not to exceed one hour.

Should a customer desire special exemption from these routine restrictions, they may file an exemption request with the Dayton Valley Water System. Exemptions may be granted if it is determined to not be detrimental to the public water system/supply.

In the event these routine conservation measures are insufficient to control the water shortage, the Dayton Valley Water System may wish to implement the mandatory measures discussed in the ***Contingency Plan*** section below.

Dayton Valley Water System also promotes the development of water conserving principles into the planning, development, and management of new landscape projects such as public parks, building grounds, and golf course. Customers are encouraged to consult with the local nursery

or perform an internet search on the availability of water conservation plants and how to renovate existing landscapes. 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.

Water Management

The Dayton Valley Water System monitors and records water levels through a SCADA system which alerts technicians when water tank levels are low or wells fail to start.

Working relationships with other local water purveyors are maintained to ensure adequate water supplies are available. The Dayton Valley Water System currently has an inter-local agreement with Carson City to provide water to both systems as needed throughout the year. The inter-connection is also monitored through the SCADA system and water system technicians meet on a periodic basis to discuss operational issues.

Dayton Valley Water System does actively monitor unaccounted for water losses on a monthly basis. Production versus sales and authorized usage allows the determination of unaccounted for water losses. Current-to-historical comparisons are examined and evaluation methods are examined to locate leaks, if significant differences are found. Historical data from 2009 shows that the unaccounted for water losses to be 4% for the entire system.

The Dayton Valley Water System does not have a formal leak detection program (distribution lines). Instead, leaks are detected through customer meter readings. Whenever a meter shows an unusually high reading, an investigation is performed and the customer is notified. All large leaks are repaired immediately and small leaks (less than 1 gallon per minute) are repaired within 48 hours. Leak detection is utilized on an as-needed basis.

The Dayton Valley Water System has 12 pressure zones that are controlled with pressure regulating, altitude, and pressure relief valves. All pressures are within NAC requirements.

The Dayton Valley Water System does have a formal well head protection program. The well head protection program consists of abandonment of old wells, vulnerability assessments, sanitary surveys, and working with the building and planning departments on new building permit applications. Dayton Valley Water System is currently working to develop an MS4 program and is working with the NDEP to develop a County-wide source water protection program.

The Dayton Valley Water System has implemented a formal meter replacement program for all meters that are not registering properly. Meter testing includes random sampling of 1% of the total meters in service. If a customer requests their meter tested, we will test their meter free of charge via a digital testing device. Utility billing staff audits billing records for zero and

abnormal usage on accounts on a monthly basis. Utility technicians are sent to investigate and determine the cause for zero or abnormal usage.

A capital improvement plan is in place, is currently being funded through rates, and there are plans to replace distribution lines at their anticipated useful life.

The Dayton Valley Water System does have a system for reusing of effluent. Effluent is treated at the Rolling A Wastewater Treatment Plant and is reused at the Dayton Valley Golf Course for irrigation purposes.

Lyon County has adopted a Plumbing Water Conservation Ordinance which applies to structures which are renovated as well as all new construction. This ordinance is furnished to local suppliers and contractors. The Lyon County Building Department, as well as Lyon County Utility staff, inspects new construction, renovation, and expansions within Lyon 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. It is vitally important to the success of any program that communication be maintained with customers during these times (e.g. through hotlines, websites, etc.). The Dayton Valley Water System recognizes this and will endeavor to keep the lines of communication with customers open at all times.

Dayton Valley Water System plans for drought response would be three (3) stages of drought response: Stage 1 – Routine Conservation, Stage 2 – Moderate Conservation, and Stage 3 – Strict Conservation. The stages are described as follows:

Stage 1 – Routine Conservation

1. Restrict watering to odd and even days depending on service address.
2. There is no restriction to hand watering or washing cars using hoses with self-closing nozzles.
3. Watering is not allowed between the hours of 10a.m. and 6:00p.m.
4. No outside watering on the 31st day of a month.
5. No outside watering when it is windy.
6. No excess water running down impervious surfaces or on to other property that may cause damage.

Exempted from Stage 1 are the following:

- Nevada licensed commercial gardeners or caretakers who are on the premises at the time watering is taking place;
- Vegetable gardens, flower beds, trees within two (2) months of planting;
- New lawns including sod, for twenty-one (21) days from planting or installation date, that have been planted prior to June 15th or after August 15th;
- Complexes that file for and receive approval of an irrigation plan.
- Residential customers adjusting and repairing their irrigation system during the non-watering times for a not to exceed time frame of one (1) hour.

Special exemptions from Stage 1 may be granted by the Lyon County Utilities Director or his/her designee, on a case-by-case basis, based upon a determination that the special request shall not be detrimental to the public water system or supply. A customer requesting an exemption must submit a written request to the Lyon County Utility District.

Stage 2 – Moderate Conservation

1. All restrictions under Stage 1 – Routine Conservation.
2. Restrict landscape irrigation to more restrictive schedule such as no watering on Mondays or watering only twice a week.
3. Limit use of water from fire hydrants to actual fire fighting use.
4. Prohibit wash-down of driveways, sidewalks, parking lots, and other impervious surfaces.

Stage 3 – Strict Conservation Stage

1. All restrictions under Stage 2 – Moderate Conservation.
2. No landscape or lawn irrigation under any circumstances.
3. No new lawn or landscape installation.
4. No wash-down of automobiles, trucks, vans or other motorized equipment except at commercial washing facilities that recycle wash water.
5. Impose an excess consumption charge of 300% of the existing rate per 1,000 gallons for water use in excess of 150% of the base amount. The Lyon County Utilities Director may make arrangements on a case-by-case basis but must report the arrangements to the Lyon County Board through the Lyon County Manager.

The Lyon County Board of Commissioners, upon its findings that one or more of the following emergency conditions are present, may impose Stage 2 (Moderate) or Stage 3 (Strict Conservation) measures. These findings are:

- Water scarcity condition exists or is likely to exist.

- Failure of water production, storage or distribution system(s).
- Demand for service in excess of Lyon County Utility District's authorized water rights.
- Order of any agency of the Federal, State or Local government having jurisdiction in such matters.
- Any other condition which may require such action.

Penalties for any person who is non-compliant or who violates any of the provisions of the Lyon County Water Conservation Ordinance are as follows:

- For the first offense, issuance of a verbal warning;
- For the second offense, issuance of a written warning both posted and mailed;
- For the third through seventh offense, a fee assessment established by the Board;
- For the eighth offense and subsequent offenses, the installation of a flow restriction device and a service fee on a time and materials basis to cover the installation cost.

Fee assessments shall be added to the owner or agent's monthly utility bill. Owners or agents shall be notified of the fee assessment through certified mail within seven (7) days of the observed violation. Protests shall be handled as provided for in Lyon County Code.

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 are already in place and will be modified as needed.

Evaluation Measurements

Audits comparing water production versus sales records is performed on a monthly basis. Results from each audit will be compared with those of the subsequent annual audits in order to determine the effectiveness of the measures/incentives.

Production figures are 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.

Usage amounts measured will include monthly use, average use per connection, and per capita use. If there is a decrease in usage 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 one 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

During the Stage 1 (Routine Conservation) phase of the conservation plan, conservation measures have provided a 10 to 15% reduction in water use.

During the Stage 2 (Moderate Conservation) phase of the conservation plan, it is estimated that conservation measures could be expected to provide an additional 10 to 15% reduction in water use.

During the Stage 3 (Strict Conservation) phase of the conservation plan, it is estimated that conservation measures could be expected to provide an additional 20 to 30% reduction in water use during the summer months.

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

Rate Analysis

The charging of variable rates for the use of water has sometimes been shown to encourage conservation of water, but not in all systems. Oftentimes the end-user will continue to pay increasing block rates out of necessity for the water used. The use of variable water rates needs to be evaluated on a case-by-case basis.

The Dayton Valley Water System does not anticipate any further water conservation savings due to a change in rate structure. The Dayton Valley Water System will continue to monitor the water usage 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.

As part of the annual water auditing, water usage versus water rights allocation is analyzed. When the customer exceeds their allocation, the overage rate per 1,000 gallons over the 5,000 gallon base allowance is doubled per month until the end of the calendar year.

Appendices

APPENDIX A
PUBLIC EDUCATION MATERIALS

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,
- Ideas for Commercial,
- 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 the Dayton Valley Water System 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.

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 B
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.

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	3 – 6 % of total production
	Pressure-reducing valves, residential	5 – 30%
Outdoor water use efficiency	Low water-use plants	7.5 %
	Lawn watering guides	15 – 20 %
	Large landscape management	10 – 25%
	Irrigation timer	10 gpcpd
Replacements and promotions	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
	Hot water demand units	10 gpcpd
Water-use regulation	Landscape requirements for new developments	10 – 20 % in sector
	Greywater reuse, residential	20 – 30 gpcpd