

CITY OF ELY

Water Conservation Plan

October 10, 2019

**City of Ely
501 Mill Street
Ely, NV 89301 (775)-289-2430**

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I. Introduction

- A. The water supply in Nevada is a precious commodity and plays an important role in determining Nevada's future. Nevada is one of the driest states in the nation as well as one of the fastest-growing ones. Nevada's future, both from an economical and quality of life view, depends heavily upon the wise management of the water supply.
- B. 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.
- C. Water use in Nevada can be classified as:
1. Domestic (household, both indoor and outdoor) – Met by public supply or private supply (e.g., wells).
 2. Commercial (businesses) – Met by public supply or private supply (e.g., non-community systems).
 3. Industrial (manufacturing/construction) – Met by public supply or private supply (e.g. non-community systems).
 4. Thermolectric (electric/fossil fuel/geothermal power generation) – Met by public supply in a minor fraction.
 5. Mining (mining processes) – Supply source varies widely from operation to operation and is dependent upon the mineral being recovered and the recovery process employed.
 6. Irrigation (land use) – Met by self-supplied or supplied by irrigation companies or districts.
 7. Livestock (farm needs) – Supply source varies.
- D. 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.
- E. It has been estimated that 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.

- F. 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.
- G. 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 the 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).
- H. 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.
- I. This plan is available for inspection during normal business hours at City Hall, 501 Mill Street, Ely, Nevada as well as on the City of Ely's website at www.elycity.com.
- J. This is the original Water Conservation Plan for the City of Ely's Municipal Water system, other than the drought plan previously submitted to the State as mandated which limited outside watering from May to October of each year to even and odd-numbered days and time of day authorized for watering.
- K. 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, June 30, 2024, by the Municipal Utilities Board, the Planning Commission and the City Council in a public meeting as required by NRS 241A, as amended from time to time.

II. Statutory Requirements

- A. This water conservation plan was prepared by the City of Ely Planning Commission, City of Ely Municipal Utilities Board, the City Water Operator, the City Engineer, the City of Ely Municipal Water Department and the Ely City Council in accordance with Nevada Revised Statute (NRS) 540. As outlined in NRS 540.141, the provisions of this plan must include:

B. General Provisions:

1. The supplier must provide an opportunity for any interested person, to submit written views and recommendations on the plan.
2. The plan must be reviewed by the Division of Water Resources after its submission and approved for compliance with regulations before it is adopted by the supplier of water. To be approved, a plan must be based on the climate and living conditions of the service area and comply with the requirements of the regulations.
3. The plan and any revisions must be available for inspection by members of the public during office hours of the supplier.
4. The plan may be revised from time to time to reflect the changing needs and conditions of the service area.
5. The supplier must update the plan and submit for approval every 5 years and comply with the requirements of this NRS 540.131 and NRS 540.141.
6. The City Council, as the governing body of the city, shall:
 - a. Adopt any ordinances necessary to carry out a plan of water conservation adopted which applies to property within its jurisdiction;
 - b. Establish a schedule of fines for the violation of any ordinances adopted; and
 - c. Hire such employees as it deems necessary to enforce the provisions of any ordinances it adopts pursuant to the plan.

C. Required Provisions of Water Conservation Plan:

1. Methods of public education:
 - a. Increase public awareness of the limited supply of water in this State and the need to conserve water.

- b. Encourage reduction in the size of lawns and encourage the use of plants that are adapted to arid and semiarid climates.
 - c. Specific conservation measures required to meet the needs of the service area.
 2. The management of water to:
 - a. Identify and reduce leakage in water supplies, inaccuracies in water meters and high pressure in water supplies, and
 - b. Where applicable, increase the reuse of effluent.
 3. A contingency plan for drought conditions that ensures a supply of potable water.
 4. A schedule for carrying out the plan.
 5. A plan for how the supplier of water will progress towards the installation of meters on all connections.
 6. Standards for water efficiency for new development.
 7. Tiered rate structures for the pricing of water to promote the conservation of water, including, without limitation, an estimate of the manner in which the tiered rate structure will impact the consumptive use of water.
 8. Watering restrictions based on the time of day and the day of the week.
 9. Measures to evaluate the effectiveness of the plan or joint plan.
 10. For each conservation measure specified in the plan or joint plan, an estimate of the amount of water that will be conserved each year as a result of the adoption of the plan stated in terms of gallons of water saved annually.

III. System Description

- A. Ely Municipal Water system is a publicly owned water system, servicing residential, commercial and industrial water system and has a current water operation permit, NV0000038. As of March 1, 2019, the Ely Municipal Water system serves water to 2383 residential water customers and 214 business customers in its service area. Of these water users, 2169 are currently billed on a flat rate basis. The service area boundaries are

the incorporated city limits and certain housing sub-divisions and the industrial complex located in the unincorporated White Pine County and cover approximately five square miles. The service area's terrain is a combination of hills and flat areas.

- B. The estimated population served in 2018 was 4149 people based upon the census from the state of Nevada. Ely Municipal Water system estimates that its customer base will decrease by -2.8% on a yearly basis through 2020. The State of Nevada, through its State Water Plan, estimates the population decrease for White Pine County through 2020 to be -0.2 % annually.
- C. The water supply is from six groundwater wells which are located within the which is located within the Steptoe Valley Basin. There is a total of six (6) wells supplying the system and a total of five (5) storage tanks. Each of these is identified in the tables below (Table 1 and Table 2).

Table 1 – Source of Supply

Well No.	Depth (ft)	Production (gpm)
RW-7P	1003	2,700
Terrace	607	500
North Street	225	700
Golf Course	670	800
10 th and M	405	800
17 th and M	300	1,350

Table 2 – Storage Tanks

Storage Tank Name	Volume (gallons)
Ward Tank	500,000
South Tank	1,000,000
Concrete Tank	2,000,000
Courthouse Tank 1	1,500,000
Courthouse Tank 2	1,000,000
North Tank	1,500,000

- D. Ely Municipal Water system has been granted water rights in the total amount of 13.366.65 Acre Feet Annually. The current water rights are listed in the table below (Table 3).

Table 3 – Water Rights

Permit No.	Well No. & Name	Rate of Diversion (max, CFS)	Annual Use (AFA)
45168	North Street	1.5	167.75
45169	10 th and M	1.15	166.49
45170	10 th and M	1.15	166.49
60665	17 th and M	3	2171.92
78698	Golf Course	3.68	2664
78699	Terrace	3.68	2664
79837	RW-6P	0.5	362
79839	RW-6P	5.25	2389.23
79841	RW-7P	5.75	2612.77
87608T	Gun Range	0.018	2

The City of Ely Water system is currently not using RW-6P; the water level has gone below the pump. There are no plans to abandon the well as of now; it will be on standby.

- E. Water is pumped via wells, or booster pumps to the storage tanks. The water is not treated but chlorinated in the storage tanks to ensure minimum standards for potable water is maintained. Our distribution mains vary in size from 4” to 20”. The water system is monitored using a SCADA operating system.
- F. Ely Municipal Water system requires, at a minimum, a D-III operator. The City currently contracts with Raul Naranjo as its Direct Responsible on Charge (DRC). Mr. Naranjo is the designated operator for the water and sewer systems. He lives in Wendover, Nevada but keeps in contact with the employees of the water system and does site visits every two weeks.
- G. The water system operator is required to perform monitoring and testing of water quality as directed by the state of Nevada Environmental Protection Agency and includes, monthly, quarterly, and annual testing. Ely Municipal Water system does not currently have any outstanding water quality issues.
- H. The last sanitary survey performed by the Nevada Department of Environmental Protection (NDEP) was completed on September 13, 2018, and shows thirteen (13) deficiencies with the system which have all been addressed. A copy of action items can be obtained by requesting a copy at the city office.

- I. Ely Municipal Water system currently charges a flat rate for residential water, metered rates for industrial and business uses. It does not currently have a tiered rate usage fee.

Residents are billed a flat rate of \$22.66 per month with a capital improvement surcharge of \$10.30 per month. Unincorporated White Pine County residents are billed a flat rate of \$30.21 per month, with a capital improvement surcharge of \$13.73. These rates will increase 3% for the next couple of years, after which the city will reevaluate water rates.

Non-metered residential City of Ely customers is charged an additional \$0.23 per 100 square feet of outside landscape water usage as a surcharge, with a \$0.10 capital improvement surcharge. White Pine County customers are charged an additional \$0.08 per 100 square feet of outside landscape water usage as a surcharge, with a \$0.03 capital improvement surcharge.

City of Ely based commercial and metered customers are billed a flat rate of \$22.00 per month for the first 15,000 gallons of water used, with an additional \$10.00 capital improvement charge per month. For each one thousand gallons of water usage per month in excess of the 15,000 gallons, the commercial and metered customers are charged an additional \$0.75 per thousand gallons used. White Pine County customers are charged \$29.33 for the first 15,000 gallons of water used, with an additional \$13.33 for capital improvement charge per month. For each one thousand gallons of water usage per month in excess of the 15,000 gallons, the commercial and metered customers are charged an additional \$0.25 per thousand gallons.

All effluent discharge leaving the City of Ely wastewater treatment plant is used on the land application site reuse fields and used to flood irrigate the Georgetown Ranch for use in growing alfalfa. All excess water not used for irrigation is discharged from the Georgetown Ranch to the surface disposal site, rapid infiltration basins.

Current water rates were established in 2019 by Resolution No. 2019-05 of the City Council.

IV. Plan Provisions

- A. 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, June 30, 2024.
- B. Ely Municipal Water system will assign a staff member to oversee the conservation efforts and this staff member will be responsible for the implementation of conservation programs, monitoring of water use, and will review /revise the conservation plan when needed.

- C. In an effort to promote voluntary conservation and aid in Nevada’s future, Ely Municipal Water system will enact the voluntary conservation measures found in the *Conservation Measures* section. When more stringent measures are needed, the Ely Municipal Water system will enact the measures found in the *Contingency Measures* section. All measures can be found in Appendix A.
- D. 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.

E. Public Education

Public education is a key for cooperation with conservation efforts, so funding for public education is crucial. Ely Municipal Water system recognizes this and will establish a conservation education program and corresponding budget.

It is the goal of Ely Municipal Water system to increase public awareness to conserve water, encourage a 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 conservation education program includes 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. Educational pamphlets will be provided to all customers upon request and should include an explanation of all costs involved in supplying drinking water and demonstrate how the water conservation practices will provide water users with long-term savings. Education materials should also encourage the reduction of lawn sizes, use of drip irrigation, use of climate-appropriate plants, and conservation tips and techniques (see Appendix B).

Customers should also be able to read and understand their water bills. Bills should be informative, going beyond the basic billing information. Bills should include comparisons to previous bills and tips on water conservation that can help customers make informed choices about their water usage. Bill inserts can also include this information.

Ely Municipal Water system would participate in public outreach opportunities such as Earth Day, provide information at a variety of school programs, participate at workshops for plumbers/suppliers/builders, and could provide incentives for conservation efforts (e.g., plumbing retrofit rebates, water conservation landscaping rebates, etc.).

Ely Municipal Water system could 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.

F. Conservation Measures:

1. In an effort to promote conservation and voluntarily conserve water, Ely Municipal Water system is adopting water-use regulations to promote water conservation during non-emergency situations. These regulations include the following non-essential water use:
 - a. Use of water which results in flooding or run-off in gutters, waterways, patios, driveway, or streets.
 - b. Use of water for washing cars, buses, boats, trailers or other vehicles without a positive shut-off nozzle on the outlet end of the hose.
 - c. Use of water through a hose for washing buildings, structures, sidewalks, walkways, driveways, patios, parking lots, or other hard-surfaced areas in a manner which results in excessive run-off or waste.
 - d. 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.
 - e. Use of water for construction purposes, such as consolidation of backfill, dust control, or other uses unless no other source of water or another method can be used.
 - f. Use of water for more than minimal landscaping in connection with any new construction.
 - g. Pursuant to City Code 10-2-15 (E) residential use of water for outside plants, lawn, landscape, and turf areas with even-numbered addresses watering on even-numbered days and odd-numbered addresses
2. Use of water through any connection when Ely Municipal 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 five (5) calendar days after receipt of such notice.

watering on odd-numbered days beginning May 1 until September 30 of each calendar year between the hours of 5:00 am to 10:00 am and 5:00 pm to 10:00 pm. Pursuant to City Code 10-2-15 (F) commercial enterprises and businesses with water meters installed are not currently subject to the aforementioned watering restrictions.

- h. Use of water for watering outside plants and turf areas using a handheld hose without a positive shut-off valve.
- i. 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.
- j. Use of water for the filling or refilling of swimming pools.
- k. Service of water by any restaurant except upon the request of the patron.
- l. In the event these conservation measures are insufficient to control the water shortage, Ely Municipal Water system may implement the mandatory measures discussed in the *Contingency Plan* section below.
- m. Ely Municipal 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 courses. 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.
- n. Ely Municipal Water system provides the following incentives for conservation. At present, it is not viable to offer any water conservation incentives. However, in the future, the City of Ely may consider implementing a tiered or multiple water rate structures for residential customers to reward low water customers.

G. Water Management:

- 1. Ely Municipal Water system monitors and records water levels at all water storage sites, monitoring is done by the City of Ely's SCADA System.
- 2. Due to the remote location of the City of Ely and lack of similar water systems in the immediate area, and no connection or ability to interconnect systems with the Ruth/McGill Water and Sewer GID, there are no interlocal agreements for the provision of water in the event of a catastrophic failure. However, the City of Ely Water system works with the Ruth/McGill Water and Sewer GID, as well as,

local plumbing contractors to obtain necessary parts in the event the City needs parts immediately that it does not have on hand. The City then orders the needed parts and replaces the parts with the system or contract that provided such assistance.

3. Ely Municipal Water system does not currently monitor unaccounted for water losses because customers are not metered, and there is no comparison to be made between production and customer usage. The Ely Municipal Water system does monitor production monthly and makes year-to-year comparisons.
4. Ely Municipal Water system does not currently have a formal leak detection program. Leaks are detected when notice is provided to the City by the users of the water system. All large leaks are repaired immediately and small leaks (less than 1 gallon per minute) are repaired as time permits and are usually scheduled for repair based upon the severity of the leak.
5. Metered Service: All customers whose premises are not used primarily as a residence shall be a metered service. All meters will be tested prior to installation, and no meter will be installed, which registers more than a two percent (2%) error rate.
6. 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. Lines that historically require an above-average number of repairs will be prioritized for earlier replacement.
7. The Ely Municipal Water system distribution system consists of seven (7) pressure zones, pressure- isolated by pressure reducing control valves. The system design is such that water pressure is in the range of 40 to 90 pounds per square inch throughout the system.
8. Ely Municipal Water system does have a system for reusing of effluent. Effluent is treated by the City of Ely's Wastewater Treatment plant and is then released into the Georgetown lease area where the water is used to irrigate leased farm land.

H. Standards for water efficiency for new development:

The City of Ely and the portions of unincorporated White Pine County served by the Ely Municipal Water system has adopted the current version of the National Plumbing Code and updates that code when the state of Nevada adopts a newer version pursuant to Title 9, Chapter 2, and applies to structures which are renovated, as well as, all new construction. The City of Ely's Building Official, who is also the Building Official for White Pine County, checks new construction, renovation, and expansions within the City and unincorporated County served by the Ely Municipal Water system to ensure

compliance with this ordinance. The Ely Municipal Water system's policy is to adhere to the planning points spelled out for new systems in NAC 445A.66735.

NAC 445A.66735 New systems: Capacity for development and treatment of water. ([NRS 445A.860](#))

1. A supplier of water for a new public water system shall ensure that, except as otherwise justified by an engineer and approved by the Division or the appropriate district board of health pursuant to subsection 2, the public water system's capacity for the development and treatment of water, whether surface water or groundwater, or both, is sufficient to provide, when the demand for water in the area of service of the system is:
 - (a) Not more than 100 residential equivalents, at least 2 gallons per minute per residential equivalent for metered systems and 2.5 gallons per minute per residential equivalent for unmetered systems.
 - (b) More than 100 but not more than 250 residential equivalents, at least 1.5 gallons per minute per residential equivalent for metered systems and 2 gallons per minute per residential equivalent for unmetered systems.
 - (c) More than 250 but not more than 500 residential equivalents, at least 1.2 gallons per minute per residential equivalent for metered systems and 1.7 gallons per minute per residential equivalent for unmetered systems.
 - (d) More than 500 residential equivalents, at least 1 gallon per minute per residential equivalent for metered systems and 1.5 gallons per minute per residential equivalent for unmetered systems.
2. The Division or the appropriate district board of health may, after evaluation on a case-by-case basis, revise the minimum requirements set forth in subsection 1 when an area of service involves unique circumstances or applications of water, including an area of service that contains mines or large residential lots or has extraordinary industrial, institutional, commercial or other nonresidential needs.

I. Contingency Plan:

1. The objective of the contingency plan would be to manage the available resources to ensure the continued supply of potable water during periods of drought or extended drought.
2. 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 is encountered, it may be necessary to implement mandatory restrictions in order to ensure an adequate supply of water to meet essential needs.

3. Ely Municipal Water system's plans for drought response would be three (3) stages of drought response: (1) warning stage, (2) alert stage, and (3) emergency stage. ***THIS IS BASED UPON THE STATE OF NEVADA DROUGHT RESPONSE.*** The stages are described as follows:
 - a. In Stage 1, the warning stage, Ely Municipal Water system would increase monitoring of its water supplies and would 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.
 - b. In Stage 2, the alert stage, Ely Municipal Water system would call for wide-based community support to achieve conservation, limit the use of fire hydrants to fire protection uses (by requiring effluent for construction and dust control purposes), implement water use restrictions, and impose penalties for ignoring the restrictions. Conservation measures at this stage would be mandatory and violations would incur fines.
 - c. In Stage 3, the emergency stage, Ely Municipal Water system would declare a drought and water shortage emergency, would enforce water use restrictions, impose fines for violations, implement the allocation of water (rationing) and impose higher fees for water usage. 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). Conservation measures at this stage would be mandatory, rationing would be imposed, violations would incur fines, and over-use would be penalized by higher rates.
 - d. When a drought is declared over, voluntary conservation measures (see ***Conservation Measures*** section) will be reinstated, and water supplies would continue to be monitored.

J. Schedule:

1. All of the provisions listed are not currently in place and are actively working to achieve results.

K. Evaluation Measurements:

1. Because individual customers are not currently metered, it is impossible to determine the effectiveness of each plan element on an individual customer basis. However, Ely Municipal Water system 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.
2. 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 one can then be implemented to take its place.
3. Once the metering program is completely instituted, then an audit comparing water production with metered amounts will be performed prior to the implementation of measures/incentives. Additional audits will then be done every year thereafter. Results from the initial audit will be compared with those of the subsequent annual audits in order to determine the effectiveness of the measures/incentives.
4. 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.
5. Usage amounts measured will include summer 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.
6. 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.).

L. Conservation Estimates:

1. It is estimated that metering alone will be the major driver of conservation, by raising awareness of individual account use. Metering alone, without a rate structure change, but with the public education elements, can be expected to provide a 10 % reduction in water use.

2. During the Stage 1 phase of the conservation plan, it is estimated that conservation measures could be expected to provide a 5-10 % reduction in water use or 24 gpcpd.
3. During the Stage 2 phase of the conservation plan, it is estimated that conservation measures could be expected to provide a 10-15 % reduction in water use or 40 gpcpd.
4. During the Stage 3 phase of the conservation plan, it is estimated that conservation measures could be expected to provide a 15-30 % reduction in water use or 70 gpcpd.
5. The estimated water savings for various end-user efforts can be found in Appendix C.

M. Rate Analysis:

1. Tiered rate structures for the pricing of water to promote the conservation of water, including, without limitation, an estimate of the manner in which the tiered rate structure will impact the consumptive use of water.
2. 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.
3. At this time, the Ely Municipal Water system does not anticipate any further water conservation savings due to a change in the rate structure. Ely Municipal 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.

APPENDICES

APPENDIX A

CONSERVATION MEASURES

I. Stage 1 – Warning Stage

1. Ely Municipal Water system would increase monitoring of water supplies.
2. Ely Municipal Water system would begin creating public awareness of the water supply situation and the need to conserve.
3. Ely Municipal Water system would inform customers of voluntary conservation measures (non-essential water uses, listed below).
 - a. Use of water through any connection when Ely Municipal 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.
 - b. Use of water which results in flooding or run-off in gutters, waterways, patios, driveway, or streets.
 - c. 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. Exceptions include washing vehicles at commercial or fleet vehicle washing facilities operated at fixed locations where equipment using water is properly maintained to avoid wasteful use.

- d. Use of water through a hose for washing buildings, structures, sidewalks, walkways, driveways, patios, parking lots, tennis courts, or other hard-surfaced areas in a manner which results in an excessive run-off or waste.
 - e. 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.
 - f. Use of water for construction purposes, such as consolidation of backfill, dust control, or other uses unless no other source of water or another method can be used.
 - g. Use of water for more than minimal landscaping in connection with any new construction.
 - h. Pursuant to City Code 10-2-15 (E) residential use of water for outside plants, lawn, landscape, and turf areas with even-numbered addresses watering on even-numbered days and odd-numbered addresses watering on odd-numbered days beginning May 1 until September 30 of each calendar year between the hours of 5:00 am to 10:00 am and 5:00 pm to 10:00 pm. Pursuant to City Code 10-2-15 (F) commercial enterprises and businesses with water meters installed are not currently subject to the aforementioned watering restrictions.
 - i. Use of water for watering outside plants and turf areas using a handheld hose without a positive shut-off valve.
 - j. 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.
 - k. Use of water for the filling or refilling of swimming pools.
 - l. Service of water by any restaurant except upon the request of the patron.
4. Ely Municipal Water system would provide customers with retrofit kits either at cost or free.

II. Stage 2 – Alert Stage

- 1. Ely Municipal Water system would set conservation goals and call for community wide support to achieve those goals.

2. Ely Municipal Water system would inform customers of mandatory conservation measures (non-essential water uses, listed in Stage 1 are now mandatory).
3. Ely Municipal Water system would inform customers of penalties if mandatory conservation measures are not observed (penalties are listed below).
4. Ely Municipal Water system would inform customers of mandatory conservation water fees.
5. Ely Municipal Water system limits the use of fire hydrants to fire protection uses only.
6. Ely Municipal Water system would provide customers with retrofit kits either at cost or free.
7. Pursuant to City Code 10-2-16, penalties for violation of mandatory conservation measures are:
 - a. First offense: Written warning issued by the city administrator, sent to the property owner.
 - b. Second offense: A civil fine, payable to the city of Ely, in the amount of fifty dollars (\$50.00).
 - c. Third offense: A misdemeanor with a minimum fine of one hundred fifty dollars (\$150.00), plus court costs and fees.
 - d. Fourth offense: A misdemeanor with a minimum fine of five hundred dollars (\$500.00), plus court costs and fees.
 - e. Fifth offense – turn-off of water services.
 - f. Offenses for separate water use restriction violations will each start at the warning stage (1st violation), and the penalties for the offenses are in addition to the regular rate schedule charges.
8. Stage 2 water rates would include an additional monthly water usage fee of or another such fee as deemed necessary.
9. Stage 2 water rates would be times the normal quantity rate, or as deemed necessary.

10. A flow restrictor can be installed if the customer is non-responsive after the 1st violation. The flow restrictor shall not restrict water delivery by greater than 50% of normal flow and shall provide the premise with a minimum of 7500 gallons/month. The flow restrictor may be removed only by the utility, only after a 30-day period has elapsed and only upon payment of the appropriate removal charge of:

a.	<u>Connection Size</u>	<u>Removal Charge</u>
	5/8-inch to 1-inch	\$25.00
	1-1/2-inch to 2-inch	\$50.00
	3-inch and larger	Actual Cost

- b. If, after the removal of the flow restrictor, any non-essential or unauthorized use of water shall continue, another flow restrictor may be installed and shall remain in place until water supply conditions warrant its removal and the appropriate charge for removal has been paid.

III. Stage 3 – Emergency Stage

1. Ely Municipal Water system would declare a drought and water shortage emergency and use media relations to supplement efforts to keep customers informed.
2. Ely Municipal Water system would set rationing benchmarks for each customer class.
3. Ely Municipal Water system would inform customers of prohibited water uses (non-essential water uses, listed in Stage 1 are now prohibited).
4. Ely Municipal Water system would inform customers of penalties if prohibited measures are not observed (penalties are listed below).
5. Ely Municipal Water system would inform customers of rationing water fees.
6. Ely Municipal Water system would limit the use of fire hydrants to fire protection uses only.
7. Ely Municipal Water system would provide customers with retrofit kits either at cost or free.

8. Ely Municipal Water system would seek monetary assistance in an effort to mitigate the drought (e.g., federal funding).
9. Offenses for separate water use restriction violations will each start at the warning stage (1st violation), and the penalties for the offenses are in addition to the regular rate schedule charges.
10. Stage 3 water rates would include an additional monthly water usage fee as deemed necessary.
11. Stage 3 water rates can be structured to be greater than normal quantity rates at times of emergencies.
12. The City of Ely may enforce penalties for violation of prohibited water use measures, as deemed necessary by the governing board. Examples of these penalties could be: Pursuant to City Code 10-2-16:
- a. 1st violation – written warning.
 - b. 2nd violation – \$500.00 civil fine, added to the water bill
 - c. 3rd violation – turn-off of water services.
13. The City of Ely may install a flow restrictor if the customer is not-responsive after the 1st violation. The flow restrictor shall not restrict water delivery by greater than 50% of the normal flow and shall provide the premises with a minimum of 7500 gallons per month.

The flow restrictor may be removed only by the City of Ely, only after a 30-day period has elapsed and only upon payment of the appropriate removal charge as deemed necessary by the governing board. Examples of these removal charges could be:

<u>Connection Size</u>	<u>Removal Charge</u>
5/8-inch to 1-inch	\$25.00
1-1/2-inch to 2-inch	\$50.00
3-inch and larger	Actual Cost

If, after the removal of the flow restrictor, any non-essential or unauthorized use of water shall continue, another flow restrictor may be installed and shall remain in place until water supply conditions warrant its removal and the appropriate charge for removal has been paid.

14. If any customer seeks a variance from the provisions of Stage 3, then that customer shall notify Ely Municipal Water system in writing, explaining in detail

the reason for such a variation. Ely Municipal Water system shall respond to each request.

APPENDIX B
PUBLIC EDUCATION MATERIALS

I. Public Education Materials:

1. 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,

2. These publications can be utilized until Ely Municipal Water system develops system-specific publications.

3. There is also numerous website that provides 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.

4. 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.

II. Tips for Landscaping

1. Watering:

- a. Detect and repair all leaks in irrigation systems.
- b. Use properly treated wastewater for irrigation where available.
- c. Water the lawn or garden during the coolest part of the day (early morning is best). Do not water on windy days.
- d. 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.
- e. Set sprinklers to water the lawn or garden only—not the street or sidewalk.

- f. Use soaker hoses and trickle irrigation systems.
- g. Install moisture sensors on sprinkler systems.

2. Planting:

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

3. Maintaining:

- a. Use mulch around shrubs and garden plants to reduce evaporation from the soil surface and cut down on weed growth.
- b. Remove thatch and aerate turf to encourage the movement of water to the zone.
- c. Raise your lawnmower 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.
- d. Minimize or eliminate fertilizing, which requires additional watering, and promotes new growth, which will also need additional watering.

root

4. Ornamental Water Features:

- a. 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

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

1. 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.

2. 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.

3. Showering

Issue: A full bathtub 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.

4. 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!

5. 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!

6. **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.

7. **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.

8. **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.

9. **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 %

10. **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 the sector
	Greywater reuse, residential	20 – 30 gpcpd