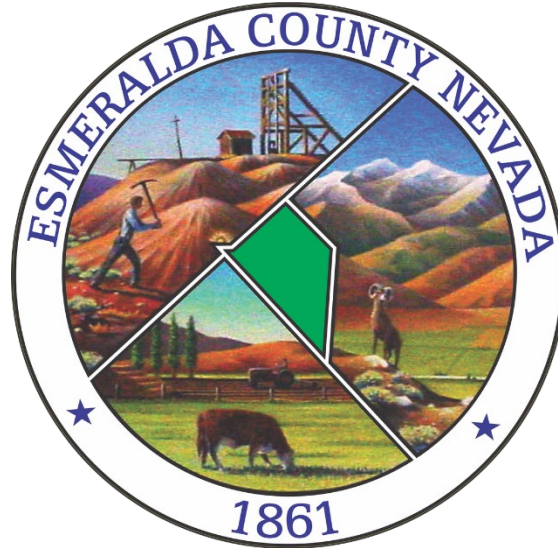


Silver Peak Water System

Water Conservation Plan

February 2021



Owner:

**Silver Peak Water System
P.O. Box 145
Goldfield, NV 89013
(775) 485-3483**

Assisted by:

**Nevada Rural Water Association
363 Fairview Drive
Carson City, NV 89701
(775) 841-4222**

Version 4 Revisions Completed by:

La Rue, E. & Anderson, M.

Silver Peak Water System Conservation Plan

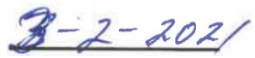
Version 4; February 2021

The revision of this document must be approved by the Esmeralda County Board of County Commissioners (BOCC) prior to being sent to the Water Planning Section of the Division of Water Resources for review. By signing this document, the Chairman of the BOCC affirms that they have reviewed and approved any and all revisions made.

Chairman of the BOCC



Date



**Board of County Commissioners
Esmeralda County, State of Nevada**

Table of Contents

Introduction.....	1
Statutory Requirements.....	2
NRS 540.131 Plan of water conservation: Procedure for adoption and updating of plan.	2
NRS 540.141 Required provisions of plan or joint plan of water conservation.	3
NRS 540.145 Requirements for supplier of water to calculate water loss.....	4
NRS 540.151 Supplier of water required to adopt plan to provide certain incentives; procedure for adoption of plan; adoption of joint plans permitted.	4
System Description.....	5
Plan Provisions.....	7
Public Education	8
Specific Conservation Measures and Incentives.....	9
Incentives Plan NRS 540.151	10
Water Management & Loss Reduction	10
Goals for Acceptable Levels of Water Loss in Water Supplies	11
Water Loss Reduction Plan	14
Effluent Reuse	17
Contingency Plan for Drought Conditions.....	17
Stage 1 – Warning Stage	18
Stage 2 – Alert Stage	19
Stage 3 – Emergency Stage	20
Schedule for Carrying Out the Plan	21
Meter Installation	21
Standards for Water Efficiency for New Development	22
Tiered Rate Structures.....	22
Watering Restrictions	22
References.....	23
Appendices.....	24
APPENDIX A – RATE STRUCTURE	25
APPENDIX B – WATER LOSS AUDIT FY 2019	28
APPENDIX C – WATER LOSS AUDIT FY 2020.....	35
APPENDIX D – NON-REVENUE WATER CALCULATION NRS 540.145	42
APPENDIX E – PUBLIC EDUCATION MATERIALS	46
APPENDIX F – END-USER WATER SAVINGS.....	49

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. In Nevada, the majority of groundwater exists in the form of Basin and Range basin-fill aquifers, carbonate-rock aquifers, and volcanic rock aquifers.

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 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 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 access to an 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 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.

This plan is available for inspection during normal business hours at the Public Works office, located at 337 Elliott Avenue, Goldfield, NV, as well as the Esmeralda County Clerk's Office, and Goldfield and Silver Peak libraries.

The original Water Conservation Plan for **Silver Peak Water System** was developed in 2001 and modified in 2007.

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 take place during, or before, February 2026.

Statutory Requirements

This water conservation plan was prepared by **Silver Peak Water System** in accordance with Nevada Revised Statute (NRS) 540. As outlined in:

NRS 540.131 Plan of water conservation: Procedure for adoption and updating of plan.

Briefly states:

1. The plan:
 - (a) Must be available for inspection by members of the public during office hours at the offices of the supplier of water;
 - (b) May be revised from time to time to reflect the changing needs and conditions of the service area. Each such revision must be made available for inspection by members of the public; and
 - (c) Must be updated every 5 years and comply with the requirements of this section and [NRS 540.141](#).
2. Suppliers of water:
 - (a) Who are required to adopt a plan of water conservation pursuant to this section; and

- (b) Whose service areas are located in a common geographical area,
→ may adopt joint plans of water conservation based on the climate and living conditions of that common geographical area. Such a plan must comply with the requirements of this section and [NRS 540.141](#).
- 3. The board of county commissioners of a county, the governing body of a city and the town board or board of county commissioners having jurisdiction of the affairs of a town shall:
 - (a) Adopt any ordinances necessary to carry out a plan of water conservation adopted pursuant to this section which applies to property within its jurisdiction;
 - (b) Establish a schedule of fines for the violation of any ordinances adopted pursuant to this subsection; and
 - (c) Hire such employees as it deems necessary to enforce the provisions of any ordinances it adopts pursuant to this subsection.

NRS 540.141 Required provisions of plan or joint plan of water conservation.

Briefly states:

- 1. A plan or joint plan of water conservation submitted to the Section for review must include provisions relating to:
 - (a) Methods of public education to:
 - (1) Increase public awareness of the limited supply of water in this State and the need to conserve water.
 - (2) Encourage reduction in the size of lawns and encourage the use of plants that are adapted to arid and semiarid climates.
 - (b) Specific conservation measures required to meet the needs of the service area, including, but not limited to, any conservation measures required by law.
 - (c) The management of water to identify and reduce water loss in water supplies, inaccuracies in water meters and high pressure in water supplies, which must include, without limitation:
 - (1) Goals for acceptable levels of water loss in water supplies. Such goals may use the following performance indicators and analyses, without limitation:
 - (I) Infrastructure water loss index;
 - (II) Water audit data validity score;
 - (III) Operational basic apparent losses;
 - (IV) Operational basic real losses; and
 - (V) Economic level of water loss.
 - (2) A plan which analyzes how the supplier of water will progress towards the goals established for the acceptable levels of water loss.
 - (d) The management of water to, where applicable, increase the reuse of effluent.
 - (e) A contingency plan for drought conditions that ensures a supply of potable water.
 - (f) A schedule for carrying out the plan or joint plan.
 - (g) A plan for how the supplier of water will progress towards the installation of meters on all connections.
 - (h) Standards for water efficiency for new development.

- (i) 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.
- (j) Watering restrictions based on the time of day and the day of the week.

NRS 540.145 Requirements for supplier of water to calculate water loss.

1. Except as otherwise provided in subsection 4, each supplier of water that is required to adopt or update a plan of water conservation in accordance with the provisions of [NRS 540.131](#) and:
 - (a) Serves 3,300 persons or more must conduct a water loss audit in accordance with the methodology and software of the American Water Works Association for water loss auditing. The results of the water loss audit must be submitted by the supplier of water to the Section with the plan of water conservation or update to the plan of water conservation, as applicable.
 - (b) Serves less than 3,300 persons must calculate the amount of water delivered by the supplier of water and the amount of water that was billed to customers of the supplier of water for each year. The calculations must be submitted by the supplier of water to the Section with the plan for water conservation or update to the plan of water conservation, as applicable.
2. If the supplier of water has previously submitted the results of a water loss audit to the Section pursuant to paragraph (a) of subsection 1, and is submitting an update to the plan of water conservation, the supplier must also submit to the Section:
 - (a) A comparison between the results of the new water loss audit and the previous water loss audit; and
 - (b) An analysis of any progress made by the supplier towards the goals for acceptable water loss established in the plan for water conservation pursuant to paragraph (c) of subsection 1 of [NRS 540.141](#).
3. If the supplier of water has previously submitted the results of the calculations conducted pursuant to paragraph (b) of subsection 1 to the Section, and is submitting an update to the plan of water conservation, the supplier must also submit to the Section:
 - (a) A comparison between the results of the new calculations and the previous calculations; and
 - (b) An analysis of any progress made by the supplier towards the goals for acceptable water loss established in the plan for water conservation pursuant to paragraph (c) of subsection 1 of [NRS 540.141](#).
4. The provisions of this section do not apply to a transient water system as defined in [NRS 445A.848](#).

NRS 540.151 Supplier of water required to adopt plan to provide certain incentives; procedure for adoption of plan; adoption of joint plans permitted.

1. Except as otherwise provided in subsection 5, each supplier of water which supplies water for municipal, industrial or domestic purposes shall adopt a plan to provide incentives:

- (a) To encourage water conservation in its service area;
 - (b) To retrofit existing structures with plumbing fixtures designed to conserve the use of water; and
 - (c) For the installation of landscaping that uses a minimal amount of water.
- The supplier of water may request assistance from the Section to develop its plan.
2. As part of the procedure of adopting a plan, the supplier of water shall provide an opportunity for any interested person to submit written views and recommendations on the plan.
 3. The supplier of water shall file a copy of the plan with the Section for informational purposes.
 4. Suppliers of water:
 - (a) Who are required to adopt a plan for incentives pursuant to this section; and
 - (b) Whose service areas are located in a common geographical area,
- may adopt joint plans.

System Description

Silver Peak Water System is a publicly-owned residential/commercial/industrial non-transient water system and has a current water operation permit, NV0000363. **Silver Peak Water System** serves water to 118 metered customers, consisting of 98 residential, 10 commercial, and 10 haul water customers in its service area in Silver Peak, which is located in Esmeralda County, Nevada. The service area's terrain is a gentle slope.

Silver Peak Water System was previously intertied with Albemarle Corporation's water system, but that is no longer the case. There are no other water systems close enough to form interties.

The estimated population served in 2018 is 150 people. **Silver Peak Water System** estimates that its customer base will increase minimally in the future. The Nevada Division of Water Planning, through its *Nevada State Water Plan*, estimates the population growth for Esmeralda County from 2008-2018 to be 0.18% (Morros & Duerr, 1999, pp. 43-47).

Silver Peak Water System has been granted water rights in the total amount of 546.874051 acre-feet per year, divided among Well No. 2, 3, and 4. The current water rights are listed in the table below (Table 1). These water rights were sourced from the Permit Search section of the Waters Rights Databases section on the State of Nevada Division of Water Resources website (Nevada Division of Water Resources, 2020b).

Table 1 – Water Rights

Certificate Date	PBU Due Date	Certificate Number	Permit No.	Well Name	Rate of Diversion (max, CFS)	Annual Use (acre-feet)
4/2/1982	11/26/1981	9894	29728	Silver Peak Well No. 2	0.30	112.014850
	6/29/2021		76343	Silver Peak Well No. 2	0.10	42.040000
	7/12/2021		69220	Silver Peak Well No. 3	0.75	294.609201
	9/8/2021		85617	Silver Peak Well No. 4	0.25	98.210000

These permits are subject to the following limitations: “The total combined duty of water under Permit 29728, Certificate 9894 and Permits 69220 and 85617 shall not exceed 504.83 acre-feet annually.” (Nevada State Engineer, Nevada Division of Water Resources, 2016, p. 1), and “The total combined duty of water under Permits 29728 and 76343, having the same point of diversion, shall not exceed 0.40 cubic feet per second and 154.05 acre-feet annually.” (Nevada State Engineer, Nevada Division of Water Resources, 2009, p. 1).

Silver Peak Water System’s water source is located in the Clayton Valley Basin (143), which was designated on March 7, 2016. The basin is approximately 555 square miles in area and has a perennial yield of 20,000 acre-feet per year (Nevada Division of Water Resources, 2020a). The aquifer located in this basin is an unconsolidated sand and gravel basin-fill aquifer that exists on the edge of the carbonate-rock province and is adjacent to and/or inclusive of carbonate-rock conditions (Planert & Williams, 1995; Welch, et al., 2007).

The town’s water is produced from three (3) groundwater wells, Silver Peak Well No. 2, 3, and 4, located approximately 1.17 and 1.37 miles southwest of the town of Silver Peak, alongside Nivloc Road. Alternatively, their locations may be described as follows: Silver Peak Well No. 2 and 4 are located in the SW 1/4 of NW 1/4 of Section 28, T.2S., R.39E., M.D.B. & M., and Silver Peak Well No. 3 is located in the SE 1/4 of NW 1/4 of Section 28, T.2S., R.39E., M.D.B. & M. Information regarding each well is listed in the table below (Table 3).

Table 2 – Source of Supply

Silver Peak Well No.	Well Log No.	Depth (feet)	Production Pumping Rate (gpm)
2	14950, 123958	400	280
3	88447	400	280
4	109038	400	280

Groundwater pumped from Well No. 3 is strictly used for haul water due to it containing levels of fluoride and radionuclides that exceed the Maximum Contaminant Level (MCL) allowed by the United States Environmental Protection Agency for drinking water. Water from Well No. 3 is pumped directly into customers' water trucks or trailers through the use of a water stand; no storage tank is utilized.

Groundwater is pumped from Well No. 2 and 4 to a storage tank with a capacity of 260,000 gallons (Tank No. 1), located on-site at the location of Well No. 2 and 4. This is enumerated in Table 3.

Table 3 – Storage Capacity

Tank No.	Volume (gal)
1	260,000

The stored water is distributed to customers through water mains consisting of PVC pipe of various sizes, ranging from six (6) inches to ten (10) inches in diameter, and service connections consisting of thermoplastic high-density polyethylene (HDPE) pipe ranging from three-quarter (3/4) inch to two (2) inches in diameter. Gravity provides system pressure to two (2) pressure zones, pressure-isolated by two (2) pressure reducing control valves. The system design is such that water pressure is in the range of 45 - 90 pounds per square inch in both zones, and exceeds 90 psi in the lowest parts of the lower zone.

Wastewater is managed individually by each customer through the use of septic systems.

Silver Peak Water System requires, at a minimum, a **Distribution Grade 1** operator. Michael Anderson is the current system operator of record, and holds both Distribution Grade 2 and Treatment Grade 2 certificates.

The system operator is required to perform daily, weekly, monthly, quarterly, and yearly monitoring and testing of water quality. **Silver Peak Water System's** source water contains high Total Dissolved Solids (TDS), but does not currently have any other outstanding water quality issues, except as previously mentioned with Well No. 3.

Silver Peak Water System utilizes a monthly base rate and a tiered usage rate for its billing system. The current rates were established in June of 2001. Tables breaking down the customer type, number, and rate schedule are located in Appendix A.

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, NRS 540.141, NRS 540.145, and NRS 540.151. The next update of this plan is to take place on, or before, February 2026.

Silver Peak Water System will assign a staff member to oversee the conservation efforts, and this staff member will be responsible for implementation of conservation programs, monitoring of water use, and will review and/or revise the conservation plan when needed.

In an effort to promote voluntary conservation and aid in Nevada's future, **Silver Peak Water System** will enact the voluntary conservation measures found in the **Specific Conservation Measures and Incentives** section. When more stringent measures are needed, **Silver Peak Water System** will enact the measures found in the **Contingency Plan for Drought Conditions** section.

The following plan provisions are discussed in detail, as required by NRS 540.141, NRS 540.145, and NRS 540.151.

Public Education

Public education is a key for cooperation with conservation efforts, so funding for public education is crucial. **Silver Peak Water System** recognizes this and will establish a conservation education program and corresponding budget.

It is the goal of **Silver Peak Water System** to increase public awareness of its water conservation plan in order to conserve water, encourage reduction in lawn sizes, encourage the use of climate-appropriate plants, encourage the use of drip irrigation, and encourage conscious decision-making regarding water use.

The conservation education program includes educational 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 water conservation practices will provide water users 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 E).

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. **Silver Peak Water System** has the ability to include additional information with bill inserts, but is currently limited in terms of providing personalized information for each customer.

Silver Peak Water System can participate in public outreach opportunities such as Earth Day, provide information at a variety of school programs, participate in workshops for plumbers/suppliers/builders, and could provide incentives for conservation efforts (e.g., plumbing retrofit rebates, water conservation landscaping rebates, etc.). A school presentation could include information on Silver Peak's water distribution system (e.g., where our water

comes from) and information on water conservation and its importance (e.g., permanent effects of depleting aquifers).

Silver Peak 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.

Specific Conservation Measures and Incentives

In an effort to promote conservation and voluntarily conserve water, **Silver Peak Water System** is adopting water-use regulations to promote water conservation during non-emergency situations. These regulations promote the disuse of the following **non-essential** water use:

- 1) Use of water through any connection when **Silver Peak Water System** has notified the customer in writing to repair a broken or defective piece of 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, driveways, or streets.
- 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. 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.
- 4) 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 excessive run-off or waste.
- 5) 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.
- 6) 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.
- 7) Use of water for more than minimal landscaping in connection with any new construction.
- 8) Use of water for watering outside plants and turf areas using a hand-held hose without a positive shut-off valve.
- 9) 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.
- 10) Use of water for the filling or refilling of swimming pools.
- 11) Service of water by any restaurant except upon the request of the patron.

In the event these conservation measures are insufficient to control a water shortage, **Silver Peak Water System** may wish to implement the mandatory measures discussed in the **Contingency Plan for Drought Conditions** section.

Incentives Plan NRS 540.151

Silver Peak Water System has adopted, as part of this Conservation Plan, the following plan to provide incentives for the installation of landscaping that uses a minimal amount of water, and for retrofits to existing structures with plumbing fixtures designed to conserve the use of water in order to encourage water conservation in the service area.

Silver Peak 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 a local nursery or perform an internet search on the availability of water conservation-friendly plants and how to renovate existing landscapes. Customers are also encouraged to evaluate irrigation management systems using metering, timing, and water sensing devices.

Silver Peak Water System provides the following incentives for conservation: At present, it is not viable to offer any water conservation incentives.

Water Management & Loss Reduction

Silver Peak Water System monitors and records pumping data manually at all three wells. Water level data is obtained via sounders.

Data from Well No. 2 and 4's flowmeters are compared with the water system's authorized consumption over a yearly period in order to calculate a water loss audit and water balance that provides key performance indicators for volume of real losses, real loss, apparent loss, and non-revenue water (NRW). The volume indicated by the wells' flowmeters over each measurement period is considered the Volume from Own Sources (VOS). The volume indicated by Well No. 3's flowmeter is considered Water Exported (WE). Authorized consumption is comprised of billed and unbilled authorized consumption, as well as reviewed and corrected authorized consumption. Currently, unbilled authorized consumption is based on a rough estimate and consists of hydrant flushing, tank flushing, and dust control.

Key Performance Indicators (KPIs) by volume include Unit Apparent Losses (vol/conn/day), Unit Real Losses^A (vol/conn/day), Unit Real Losses^B (vol/pipeline length/day), Unit Total Losses (vol/conn/day), and Infrastructure Leakage Index (ILI). Unavoidable Annual Real Loss (UARL) is also calculated, although it is important to note that it is not necessarily accurate, as it is not calculated using the UARL equation variation that is most accurate for small water systems (less than 3000 connections) (Lambert, 2020). As a result, the calculated ILI value is also inaccurate, as it is simply the ratio of the Current Annual Real Loss (CARL) to the UARL. Additionally, caution must be used when interpreting Unit Loss KPIs, as **Silver Peak Water System** is on the extreme small end of size (around 125 connections).

KPIs by value include Apparent Loss Cost Rate (value/conn/year), Real Loss Cost Rate (value/conn/year), and Total Loss Cost Rate (value/conn/year).

In addition to these KPIs, a Data Validity Tier (DVT) for each specific audit is calculated. This DVT is a strong indicator of water loss audit data quality.

Water loss audits have been performed for the 2019 and 2020 fiscal years. Fiscal year 2020's water exported and authorized consumption has been reviewed and the errors discovered in the billing system's records have been accounted for in the audit calculations. The KPI values for each can be found in the following table (Table 5), and the full reports in Appendices B and C. Additionally, a simpler calculation of just NRW, as required by NRS 540.145 can also be found in Appendix D. Please note that the KPI values are estimated, as data gaps prevent accurate calculations. These data gaps will be addressed in the goals section.

Table 5 – Water Loss Audit KPI Values

Key Performance Indicators	FY 2019	FY 2020
Unavoidable Annual Real Loss (UARL)	1.3 MG/Yr 29.4 gal/conn/day	1.3 MG/Yr 29.4 gal/conn/day
Unit Apparent Losses (vol/conn/day)	9.7 gal/conn/day	9.9 gal/conn/day
Unit Real Losses ^A (vol/conn/day)	44.9 gal/conn/day	60.6 gal/conn/day
Unit Total Losses (gal/conn/day)	54.6 gal/conn/day	70.5 gal/conn/day
Unit Real Losses ^B (vol/ pipeline length/day)	802 gal/mile/day	1082 gal/mile/day
Infrastructure Leakage Index (ILI)	1.5	2.1
Apparent Loss Cost Rate (value/conn/year)	7.68 \$/conn/year	7.87 \$/conn/year
Real Loss Cost Rate (value/conn/year)	35.73 \$/conn/year	48.22 \$/conn/year
Total Loss Cost rate (value/conn/year)	43.42 \$/conn/year	56.10 \$/conn/year

Goals for Acceptable Levels of Water Loss in Water Supplies

Before accurate loss control target-setting and benchmarking can be established, a majority of the following goals must be met:

- Analyze the business process for customer metering, billing functions, and water supply operations
 - The current metering and billing process leaves too much room for human error. The manual recording of meter readings, manual entering of these readings into the billing system, manual rate adjustment based on usage tiers for commercial and haul water accounts, manual adjustment of usage multipliers, physical separation of billing department and utilities department, and disuse of the semi-automatic billing system enable data handling errors that may be difficult to catch if a regular and thorough review of each month's billing cycle is not completed. The current goal is to conduct the aforementioned review each month.

- Identify and resolve data gaps
 - Begin data entry of handwritten well flowmeter logs into spreadsheet
 - Begin daily logging of storage tank levels
 - Tank level indicator needs to be repaired
 - Begin metering of fire hydrants when using for dust control and street cleaning
 - Use fire hydrant flow test calculations and log flushing time to accurately estimate volume used when flushing hydrants
 - Tank level indicator needs to be repaired
 - Log time, date, and duration when storage tank is flushed and use tank height data to calculate volume used when flushing tank
 - Log time, date, and duration when storage tank overflow occurs to estimate volume lost
 - Conduct measurement of water distribution mains and break down length by each pipe diameter size
 - Conduct field count of existing water service connections and break down by connection size, notating meter serial number and/or Customer ID and/or Factory ID if applicable and service location based on town block and lot map and/or through GPS
 - Average Operating Pressure: New and existing pressure data may be utilized to calculate a weighted average instead of the current simple average. There are currently no plans to collect continuous pressure data, although this is subject to change.
 - Calculate the Variable Production Cost in \$ per Million gallons.
 - Short-run marginal costs include:
 - Chemicals and power for disinfection
 - Power for distribution
 - Long-run marginal costs include:
 - Accelerated wear and tear on dynamic equipment (pumps and chemical dosing pumps)
 - Payouts for damage claims from main and service line breaks
 - Full cost pricing that includes all lifecycle costs and externalities
- Improve supply metering
 - Begin looking into installing a SCADA system at the wells using existing spare equipment that may include the monitoring of the aquifer water level, pressure, flow rate, pump runtime, pump starts, flowmeter, pump condition (running or stopped), tank level, and room temperature.
 - Begin regular (annually or semi-annually) in-situ flow accuracy testing of well flowmeters. In-situ flow accuracy testing is defined as a test process that confirms the flow measuring accuracy of the primary device (the flowmeter), in its installed location, using an independent reference volume.
 - Increase frequency of data review for anomalies/errors.
- Conduct loss assessment investigations on a sample portion of the system
 - Perform customer meter tests, if possible, to determine accuracy percentage for each meter subset

- Conduct a leak survey using listening equipment to detect water main, hydrant, and service connection leaks
- Assess distribution system for signs of unauthorized consumption
- Begin to assess long-term needs requiring large expenditure
 - Customer meter replacement currently occurs on an as-needed basis, with non-functioning and active manual meters taking priority.
 - **Silver Peak Water System** is currently in the process of implementing a new Automatic Meter Reading (AMR) system and billing system with a loan from the NDEP State Revolving Fund to reduce the time spent reading meters, reduce the human error within the metering and billing system, increase the accuracy of meter readings, and provide a more accurate comparison between water supplied and billed metered consumption, and, therefore, NRW. As a part of this project, all customer meters that cannot be retrofitted with radio reading devices will be replaced.
 - The last water main replacement project occurred in 2019. Water main replacement currently occurs on an as-needed basis and any future replacement projects will occur based on the expected life of each water main. Any water mains that have no expected life due to a lack of documentation will be replaced on an as-needed basis.

Once the above goals have been met (a plurality of which involve resolving data gaps), **Silver Peak Water System** will begin target-setting and benchmarking to establish apparent and real loss reduction goals, and utilize KPIs to compare real loss standing. Current rough targets for real and apparent loss reduction can be found in the following table (Table 6). Please note that the current and estimated values are estimates and only serve as general goals until data gaps can be resolved and more accurate KPIs calculated.

Table 6 – Apparent & Real Water Loss Reduction Goals Expressed in KPI Values

Key Performance Indicators	FY 2019	FY 2020	Goals
Unavoidable Annual Real Loss (UARL)	1.3 MG/Yr 29.4 gal/conn/day	1.3 MG/Yr 29.4 gal/conn/day	N/A
Unit Apparent Losses (vol/conn/day)	8.5 gal/conn/day	9.9 gal/conn/day	5.1 gal/conn/day
Unit Real Losses ^A (vol/conn/day)	46.1 gal/conn/day	60.6 gal/conn/day	27.5 gal/conn/day
Unit Total Losses (gal/conn/day)	54.6 gal/conn/day	70.5 gal/conn/day	32.6 gal/conn/day
Unit Real Losses ^B (vol/pipeline length/day)	823 gal/mile/day	1082 gal/mile/day	525 gal/mile/day
Infrastructure Leakage Index (ILI)	1.6	2.1	1.0
Apparent Loss Cost Rate (value/conn/year)	6.73 \$/conn/year	7.87 \$/conn/year	5.15 \$/conn/year
Real Loss Cost Rate (value/conn/year)	36.69 \$/conn/year	48.22 \$/conn/year	22.60 \$/conn/year
Total Loss Cost rate (value/conn/year)	43.42 \$/conn/year	56.10 \$/conn/year	27.75 \$/conn/year

Water Loss Reduction Plan

As mentioned above, the plan to progress towards the goals established for acceptable levels of water loss begins with reviewing each month's billing process, resolving the identified data gaps (listed above), improving supply metering, conducting a loss assessment on a sample portion of the distribution system, and moving forward with the AMR metering and billing system implementation.

The monthly billing review will be conducted by the Public Works department's secretary and/or other department employees as deemed necessary. Due to the small number of customers, a spreadsheet will be set up to verify customers are being billed correctly, while also allowing high or low usage to be easily noticeable and investigated.

The identified data gaps will be split into two categories: those that are easily resolved with effort (Category 1), and those that require a more substantial amount of work and/or time to resolve (Category 2).

Category 1 data gaps include the following:

- Begin data entry of handwritten well flowmeter logs into spreadsheet
- Begin metering of fire hydrants when using for dust control

- Log time, date, and duration when storage tank overflow occurs to estimate volume lost

Daily logging of well flowmeters already occurs. The data will be maintained in a spreadsheet for the foreseeable future.

Fire hydrants are mainly used for street cleaning and dust control when working on new water and sewer installs, as well as repairing existing ones. The Public Works department has access to surplus hydrant meters that can be used to determine the volume of water used when hydrants are used for this purpose. It will become policy of **Silver Peak Water System** to use hydrant meters, when possible, to help accurately determine unbilled authorized consumption.

Future tank flushing will require the logging of the time, date, and duration of each flush to help accurately determine unbilled authorized consumption.

If storage tank overflow occurs, all efforts will be made to estimate the volume lost during such an event. This volume would be classified as part of real loss and will help narrow down real loss to volumes that the utility cannot account for.

Category 2 data gaps include the following:

- Begin daily logging of storage tank levels
 - Tank level indicator needs to be repaired
- Log time, date, and duration when storage tank is flushed and use tank height data to calculate volume used when flushing tank
 - Tank level indicator needs to be repaired
- Use fire hydrant flow test calculations and log flushing time to accurately estimate volume used when flushing hydrants
- Conduct measurement of water distribution mains and break down length by each pipe diameter size
- Conduct field count of existing water service connections and break down by connection size, noting meter serial number and/or Customer ID and/or Factory ID if applicable and service location based on town block and lot map and/or through GPS
- Average Operating Pressure: New and existing pressure data may be utilized to calculate a weighted average instead of the current simple average. There are currently no plans to collect continuous pressure data, although this is subject to change.
- Calculate the Variable Production Cost in \$ per Million gallons.
 - Short-run marginal costs include:
 - Chemicals and power for treatment
 - Power for distribution
 - Long-run marginal costs include:
 - Accelerated wear and tear on dynamic equipment (pumps and chemical dosing pumps)
 - Payouts for damage claims from main and service line breaks
 - Full cost pricing that includes all lifecycle costs and externalities

Hydrant flushing cannot utilize hydrant meters to determine the volume used, as any flow restriction will negatively impact the goals of flushing. Hydrant flow tests have been conducted in the past, but this data is currently unavailable and new tests may need to be conducted. Once flows have been established for each hydrant, determining the volume used when flushing will be calculated based on the duration of each hydrant flush. This volume would be classified as unbilled unmetered authorized consumption.

The length of each water main has been calculated in the past, but this data is currently unavailable and new measurements may need to be conducted. The measuring process would utilize existing engineering drawings as a reference and a rangefinder for the actual measuring. This data point, along with the material and diameter size of each main, will be documented in writing. Expected life will also be associated with each main. This data is important in determining an accurate calculation of UARL and ILI.

The current billing database does not include a number of inactive accounts/service connections that exist in the field. It is estimated that approximately 10 or more unaccounted for service connections exist. These connections will be field located and verified by identifying existing meter boxes and meters, if possible. This process will need to be completed with the Public Works supervisor, who possess sole knowledge of many service connection locations. All service connections will be plotted on a map of the town as accurately as possible. They will also be documented in a spreadsheet with each connection's associated meter information, if applicable, and the property owner's information. Digital copies of the map and spreadsheet will be backed up in order to preserve this information. In establishing an accurate number of service connections, the calculated water loss KPIs will be more accurate.

The operating pressures of the distribution system's two pressure zones have been calculated at multiple locations in the past, using fire hydrants. This data is currently unavailable, and, as such, the current calculated average operating pressures consist of simple averages, rather than weighted ones. New hydrant flow rates and pressure data will need to be obtained in order to calculate more accurate average operating pressures.

The current Variable Production Cost (VPC) in \$/Million gallons is unknown. As such, the Customer Retail Unit Charge (CRUC), calculated as a weighted average is used in its place to calculate the value of apparent and real losses, unbilled authorized consumption, and NRW. The VPC will be calculated using the short-run and long-run marginal costs listed above. These costs will be adjusted on a yearly basis, and, in turn, the VPC will be adjusted yearly. This calculation will be performed by the Public Works secretary and/or other department employees as deemed necessary.

Each of the above data gap resolution procedures will be completed as soon as possible, beginning with Category 1, and completing Category 2 in an order based on ease of completion or as otherwise directed to by the Public Works supervisor.

The task of improving supply metering consists of three parts: implementing a SCADA system, in-situ flow accuracy testing of the wells' flowmeters, and increasing the frequency of data review for errors and anomalies. Data review has currently increased to a monthly

frequency, along with logging of the wells' flowmeters. The frequency and necessity of in-situ flow accuracy testing will be determined by the Public Works supervisor.

The completion of a loss assessment on a sample portion of the distribution system will consist of customer meter testing, a leak survey, and assessing unauthorized consumption. **Silver Peak Water System** does not possess the capability to accurately test customer meters in-house, and any tests done will likely only reveal meters with a high percentage of inaccuracy. A leak survey would likely be performed in-tandem with the measuring of water mains. The conduction of a leak survey will be at the discretion of the Public Works supervisor. Due to the small size of the distribution system, unauthorized consumption can easily be identified, if all of the previous steps are completed. Even without the completion of these steps, unauthorized consumption can be narrowed down to theft from hydrants, the use of inactive service connections, and unknown service connections without meters. Once each service connection is identified, tracking of inactive service accounts will allow for close monitoring of unauthorized consumption.

The majority of this plan's provisions are estimated to be completed within two years of the Conservation Plan's approved update as of February 2021.

Effluent Reuse

Silver Peak Water System does not have a system for managing or reusing effluent. Effluent is managed and treated through customer-maintained individual septic systems.

Contingency Plan for Drought Conditions

The objective of the contingency plan is to manage the usage of available water resources to ensure a continued reliable supply of potable water during periods of drought or extended drought.

It is envisioned that voluntary conservation will be sufficient to ensure access to 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 access to an adequate supply of water to meet essential needs.

Silver Peak Water System's plans for drought response are designated into three (3) stages of drought response: (1) warning stage, (2) alert stage, and (3) emergency stage.

These drought stages are based on the static water level (water level under non-pumping conditions) of the municipal system wells, Silver Peak Well No. 2 and 4. The static water level of Well No. 2 is 280 feet (distance below surface) as of its drill date. The static water level of Well No. 3 is approximately 237 feet as of its drill date. The static water level of Well No. 4 is 280 feet as of its drill date. The well screen in Well No. 2 is located from 280 feet to 400 feet. The well screen in Well No. 3 is located from 300 feet to 400 feet. The well screen in Well No. 4 is located from 300 feet to 400 feet.

Stage 1: Declared if the static water level drops to 290-feet (10 ft decline)

Stage 2: Declared if the static water level drops to 300-feet (20 ft decline)

Stage 3: Declared if the static water level drops to 310-feet (30 ft decline)

The stages are described as follows:

Stage 1 – Warning Stage

1. **Silver Peak Water System** will increase monitoring of water supplies.
2. **Silver Peak Water System** will begin creating public awareness of the water supply situation and the need to conserve.
3. **Silver Peak Water System** will inform customers of **voluntary** conservation measures (dis-use of non-essential water uses, listed on the following page).
4. **Silver Peak Water System** will provide retrofit kits (low-flow faucet aerators, low-flow showerheads, leak detection tables, and replacement flapper valves) at cost, and they can be actively distributed, if needed.

In **Stage 1**, the warning stage, **Silver Peak Water System** will increase the monitoring of its water supplies, including increasing the review frequency of static and pumping water levels, drawdown, and recovery time, and will begin creating public awareness of the water supply situation and the need to conserve. Public awareness will include flyers sent to each customer and regular updates to the county website. The county commissioners will be notified if the static water level begins to drop before Stage 1 is reached. Conservation measures at this stage will be **voluntary** for residential and commercial users. Alternatives for industrial water supply will be identified and reviewed to preserve municipal water. Retrofit kits (low-flow faucet aerators, low-flow showerheads, leak detection tables, and replacement flapper valves) can be made available at cost, and can be actively distributed, if needed.

Non-essential water uses include:

- 1) Use of water through any connection when **Silver Peak Water System** has notified the customer in writing to repair a broken or defective piece of 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, driveways, or streets.
- 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. 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.
- 4) 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 excessive run-off or waste.

- 5) 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.
- 6) 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.
- 7) Use of water for more than minimal landscaping in connection with any new construction.
- 8) Use of water for watering outside plants and turf areas using a hand-held hose without a positive shut-off valve.
- 9) 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.
- 10) Use of water for the filling or refilling of swimming pools.
- 11) Service of water by any restaurant except upon the request of the patron.

Stage 2 – Alert Stage

1. **Silver Peak Water System** will set conservation goals and call for wide-based community support to achieve those goals.
2. **Silver Peak Water System** will inform customers of **mandatory** conservation measures (dis-use of non-essential water uses, listed in Stage 1 is now **mandatory**).
3. **Silver Peak Water System** will inform customers of penalties if **mandatory** conservation measures are not observed (penalties are listed below).
4. Use of water for outside plants, lawns, landscapes, and turf areas will only be permitted two days a week, and mandatory water conservation fees will apply for any violations.
5. **Silver Peak Water System** will limit the use of fire hydrants to fire protection uses only.
6. **Silver Peak Water System** will provide customers with retrofit kits at cost.
7. **Silver Peak Water System** will consider increasing water usage rates by up to 1.5 times the existing rates as deemed necessary.

In **Stage 2**, the alert stage, **Silver Peak Water System** will establish a water usage reduction goal and call for wide-based community support to achieve conservation. Conservation measures at this stage will be **mandatory** and violations will incur penalties. Watering restrictions will be implemented (see provision number five above), and penalties imposed for ignoring these restrictions. The use of fire hydrants will be limited to fire protection uses (by requiring imported water for construction and dust control purposes). Retrofit kits will continue to remain available as in **Stage 1**. Water rates may be increased by up to 1.5 times the normal usage rate as deemed necessary.

Penalties for violation of **mandatory** conservation measures and outdoor watering restrictions are:

- 1st violation – written warning.
- 2nd violation – \$50.00
- 3rd violation – turn-off of water services.

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

A flow restrictor may 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. The flow restrictor may be removed only by **Silver Peak Water System**, and only after a 30-day period has elapsed and only upon payment of the \$100.00 removal charge.

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.

Stage 3 – Emergency Stage

1. **Silver Peak Water System** will declare a drought and water shortage emergency and use media relations to supplement efforts to keep customers informed.
2. **Silver Peak Water System** will set rationing benchmarks for each customer class.
3. **Silver Peak Water System** will inform customers of water rationing violation fees.
4. **Mandatory** conservation measures will remain in place through **Stage 3**.
5. **Silver Peak Water System** will inform customers of increased penalties if **mandatory** conservation measures are not observed (penalties are listed below).
6. **Silver Peak Water System** will prohibit outdoor watering.
7. **Silver Peak Water System** will limit the use of fire hydrants to fire protection uses only.
8. **Silver Peak Water System** will provide customers with retrofit kits either at cost or free of charge.
9. **Silver Peak Water System** will consider increasing water usage rates by up to two times the normal usage rate as deemed necessary.
10. **Silver Peak Water System** will seek monetary assistance in an effort to mitigate the drought (e.g., federal funding).

In **Stage 3**, the emergency stage, **Silver Peak Water System** will declare a drought and water shortage emergency. Media relations will be activated in order to inform customers. Water rationing benchmarks and violation penalties will be established for each customer class, and customers will be informed. **Mandatory** conservation measures will remain in place and continue to be enforced, with customers being informed of the increased penalties. Outdoor watering will now be prohibited, and **mandatory** conservation penalties will apply to any violations. The use of fire hydrants will continue to be limited to fire protection uses. Water rates may be increased by up to two times the normal usage rate as deemed necessary. 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 will be reinstated and water supplies will continue to be monitored.

Penalties for violation of **mandatory** conservation measures and outdoor watering restrictions are:

- 1st violation – written warning.
- 2nd violation – \$100.00
- 3rd violation – turn-off of water services.

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

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. The flow restrictor may be removed only by **Silver Peak Water System**, and only after a 30-day period has elapsed and only upon payment of the \$200.00 removal charge.

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.

Water rationing violation penalties will be applied as:

Every 1000 gallons used above the customer class-specific rationing benchmark will be billed at twice the normal usage rate.

If any customer seeks a variance from the provisions of Stage 3, then that customer shall notify **Silver Peak Water System** in writing, explaining in detail the reason for such a variation. **Silver Peak Water System** shall respond to each request.

Schedule for Carrying Out the Plan

Many of the provisions listed in this water conservation plan are currently in place and are actively working to achieve results. As outlined prior in the **Water Loss Reduction Plan**, the establishment of an ongoing review of each month's billing calculations, the resolution of data gaps, and improvement of supply metering are estimated to be completed within two years of the approval of this updated plan. Once these goals have been met, accurate water loss target-setting and benchmarking will begin.

Once approved, the updated plan will be made available on the county website for easy access and review.

Meter Installation

The water system is currently metered.

Water mains that historically require an above average number of repairs will be prioritized for earlier replacement.

Standards for Water Efficiency for New Development

Silver Peak Water System's policy is to use the current version of the Uniform Plumbing Code (UPC) adopted by the State of Nevada Public Works Division as the standard for all renovated structures and new construction. The current version as of this plan's most recent update is the 2018 UPC. The Town of Silver Peak does not currently have an ordinance wherein any version of the UPC is officially adopted.

Tiered Rate Structures

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.

Silver Peak Water System utilizes variable rates in order to discourage excessive water use and cover the cost of increased pumping frequency and duration.

As of the most recent update to this plan, the current tiered rate structure primarily impacts haul water users. With the singular tier threshold for this customer class being so high (500,010 gallons and over per billing period), it does not act as a deterrent. Those customers who do cross the threshold are unlikely to seek water elsewhere, and their water needs will remain the same, regardless of conservation efforts, due to the nature of its use (drilling, road work, ranching), and the isolated location of Silver Peak.

See Appendix A for current rate structure.

A new tiered rate structure would need to be implemented in order to better evaluate its usefulness in discouraging excessive water use while maintaining funding for **Silver Peak Water System**.

Watering Restrictions

Watering of outdoor plants, lawns, landscapes, and turf areas are prohibited from the hours of 12pm – 6pm due to heavy evaporation during this time frame. These watering restrictions are enacted on a voluntary basis.

References

- Lambert, A. (2020, September 14). *Low ILLs and small systems*. LEAKSSuite Library. <https://www.leakssuitelibrary.com/low-ilis-and-small-systems/>.
- Morros, P. G., & Duerr, N. S. (1999). *Nevada state water plan* (Vol. Appendix 2, pp. 43–47). Carson City, Nevada: Nevada Division of Water Planning. Retrieved from <http://water.nv.gov/waterplandetail.aspx>
- Nevada Division of Water Resources. (2020a, August 12) *Hydrographic area summary, Basin 143*. <http://water.nv.gov/DisplayHydrographicGeneralReport.aspx?basin=143>.
- Nevada Division of Water Resources. (2020b, August 12). *Water rights*. <http://water.nv.gov/waterrights.aspx?rights=Water+Rights+Databases>.
- Nevada State Engineer, Nevada Division of Water Resources. (2009, June 29). *Permit to change point of diversion, manner of use and place of use of the public waters of the State of Nevada heretofore appropriated* (Permit No. 76343). Carson City, Nevada: Nevada State Engineer's Office. Retrieved from http://images.water.nv.gov/images/Book_Records/76000/76343.pdf
- Nevada State Engineer, Nevada Division of Water Resources. (2016, September 8). *Permit to change the public waters of the State of Nevada heretofore appropriated* (Permit No. 85617). Carson City, Nevada: Nevada State Engineer's Office. Retrieved from http://images.water.nv.gov/images/Book_Records/85000/85617.pdf
- Planert, M., & Williams, J. S. (1995). (rep.). *Ground water atlas of the United States: Segment 1, California, Nevada* (Ser. Hydrologic Atlas, p. B4). U.S. Geological Survey. Retrieved from <https://doi.org/10.3133/ha730B>
- Welch, A. H., Bright, D. J., Knochenmus, L. A., & Editors. (2007). *Water resources of the basin and range carbonate-rock aquifer system, White Pine County, Nevada, and adjacent areas in Nevada and Utah* (Figure 1, p. 8). U.S. Geological Survey. Retrieved from <https://pubs.usgs.gov/sir/2007/5261/pdf/sir20075261>

Appendices

APPENDIX A – RATE STRUCTURE

Silver Peak Utilities Water & Sewer Rates

SEWER

Silver Peak Utilities does not utilize a wastewater collection system. Wastewater disposal is accomplished through the use of individual septic systems, and is the responsibility of each customer.

ADDITIONAL FEES

Estimate Fee	\$ 25.00	Credited to bill after service installed.
Application Processing Fee	\$ 10.00	
Disconnect Fee	\$ 25.00	
Reconnect Fee	\$ 25.00	
Reconnect Fee (Outside Regular Work Hours)	\$ 30.00	
Inactive Fee	\$ 5.00 /month	Service requested to be inactive, but not disconnected. (Replaces normal Monthly Service Charge.)
Returned Check Fee	\$ 25.00	
24 Hour Disconnect Notice	\$ 10.00	
Penalties/Late Fees	10% of arrears	Additional 2% each month after one month w/o payment.

APPENDIX B – WATER LOSS AUDIT FY 2019

Silver Peak Water System Conservation Plan

Version 4; February 2021



AWWA Free Water Audit Software v6.0

FWAS v6.0

American Water Works Association Copyright © 2020. All Rights Reserved.

This spreadsheet-based water audit tool is designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. It provides a "top-down" summary water audit format and is not meant to take the place of a full-scale, comprehensive water audit format. Auditors are strongly encouraged to refer to the most current edition of AWWA M36 Manual for Water Audits for detailed guidance on the water auditing process and targeting loss reduction levels. This tool contains several separate worksheets. Sheets can be accessed using the tabs at the bottom of the screen, or by clicking the TOC links below.

Table of Contents (TOC)

- Start Page** The current sheet. Enter contact information and basic audit details.
- Worksheet** Enter the required data on this worksheet to calculate the water balance and data grading.
- Interactive Data Grading** Answer questions about operational practices for each audit input, and the data validity grades will automatically populate.
- Dashboard** Review NRW components, performance indicators and graphical outputs to evaluate the results of the audit.
- Notes** Enter notes to explain how values were calculated, document data sources, and related information about data management practices.
- Blank Sheet** By popular demand! A blank sheet. The world is your canvas.
- Water Balance** The values entered in the Worksheet automatically populate the Water Balance.
- Loss Control Planning** Use this sheet to interpret the results of the audit validity score and performance indicators.
- Definitions** Use this sheet to understand the terms used in the audit process.
- Service Connection Diagram** Diagrams depicting possible customer service connection line configurations.
- Acknowledgements** Acknowledgements for development of the AWWA Free Water Audit Software v6.0.

AWWA Web Resources for Water Loss Control

<https://www.awwa.org/Resources-Tools/Resource-Topics/Water-Loss-Control>
 Items referenced in the Free Water Audit Software v6.0 on the web:
 Data Grading Matrix v6.0
 Example Water Audit v6.0
 Water Audit Compiler v6.0
 AWWA Reports on Performance Indicators
 M36 Manual

Enter Basic Information

Name of Utility:	Silver Peak Utilites
Name of Contact Person:	Michael Anderson
Email:	escopw@gmail.com
Telephone Ext.:	775-485-3483
City/Town/Municipality:	Silver Peak
State / Province:	Nevada (NV)
Country:	United States
Audit Preparation Date:	Feb 12 2021
Audit Year:	2019
Audit Year Label:	Fiscal (Fiscal, Calendar, etc)
Audit Period Start Date:	Jun 28 2018
Audit Period End Date:	Jun 26 2019
Volume Reporting Units:	Million gallons (US)
Water System Structure:	Retail
Water Type:	Other -----> Potable + Exported Raw
System ID Number:	NV0000363
Validator Name/ID:	n/a
Validator Email:	
Estimated Total Population Served by Water Utility:	150

Key of Input Acronyms

In order of appearance in the Worksheet

- VOS** Volume from Own Sources
- VOSEA** VOS Error Adjustment
- WI** Water Imported
- WIEA** WI Error Adjustment
- WE** Water Exported
- WEEA** WE Error Adjustment
- BMAC** Billed Metered Authorized Consumption
- BUAC** Billed Unmetered Authorized Consumption
- UMAC** Unbilled Metered Authorized Consumption
- UUAC** Unbilled Unmetered Authorized Consumption
- SDHE** Systematic Data Handling Errors
- CMI** Customer Metering Inaccuracies
- UC** Unauthorized Consumption
- Lm** Length of mains
- Nc** Number of service connections
- Lp** Average length of (private) customer service line
- AOP** Average Operating Pressure
- CRUC** Customer Retail Unit Charge
- VPC** Variable Production Cost

Color Key

User input Calculated Optional default

Guidance for the Worksheet

Choosing to enter unit of **percent** or **volume** (applies to VOSEA, WIEA, WEEA, CMI)

choose entry option:

1.00%	percent	or	25.000
	volume		

Choosing to enter **default** or **custom input** (applies to UUAC, SDHE, UC)

choose entry option:

0.25%	default	or	75.000
	custom		

Guidance for the Interactive Data Grading

Use acronym buttons in IDG header to navigate among inputs. Acronym Key above. White = needs answers, orange = complete, clear = not required. Example below.

VOS	VOSEA	WI	WIEA	WE	WEEA	BMAC	BUAC	UMAC	UUAC
SDHE	CMI	UC	Lm	Nc	Lp	AOP	CRUC	VPC	

After clicking an acronym button, answer all visible questions in the order they're presented, choosing best-fit answer

answer 2

Grade will populate when all visible questions are complete for an input

7

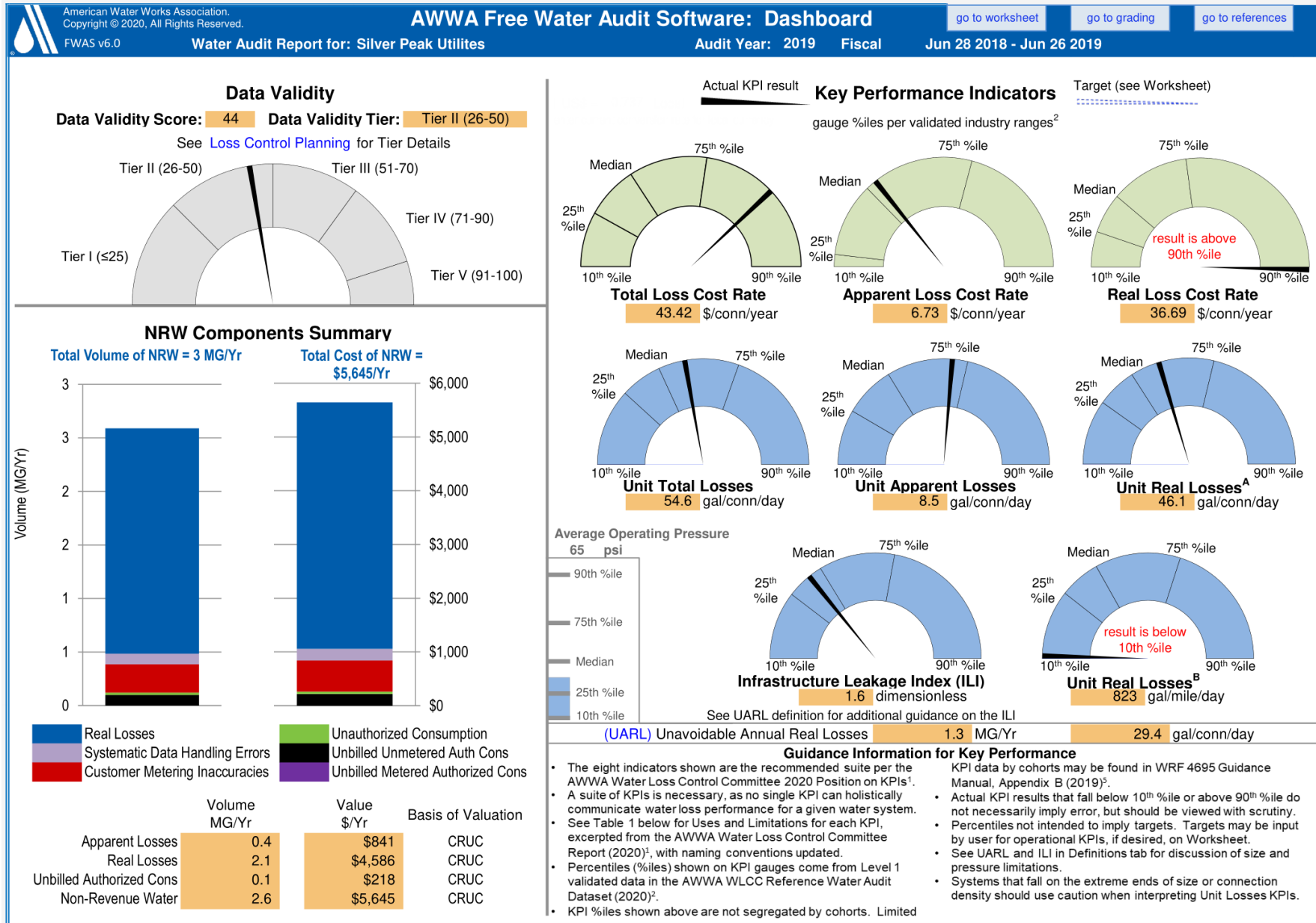
The limiting criteria will be labeled along the right. If only 1 limiting criterion is shown, improving on that criterion will achieve a higher data grade. If multiple limiting criteria are shown, improving on *each* limiting criterion is necessary to achieve a higher data grade. A complete inventory of data grading criteria is available in the Data Grading Matrix v6.0 (see web resources)

Limiting

If you have questions or comments regarding this software please contact us at: wlc@awwa.org

Silver Peak Water System Conservation Plan

Version 4; February 2021



Silver Peak Water System Conservation Plan


Version 4; February 2021

Table 1 Source: AWWA Water Loss Control Committee Report (2020)¹, with naming conventions updated
2020 AWWA Water Audit Method – Water Audit Outputs and Key Performance Indicators: Uses and Limitations

Type	Indicator	Description	Suitable Purposes					Uses and Limitations	Principal Users		
			Assessment	Bench-Marking	Target-Setting	Planning	Tracking				
Attribute	Apparent Loss Volume	Calculated by Free Water Audit Software	✓					✓	Assess loss level	Utility, Regulators	
	Apparent Loss Cost	Calculated by Free Water Audit Software	✓					✓	Assess cost loss level	Utility, Regulators	
	Real Loss Volume	Calculated by Free Water Audit Software	✓					✓	Assess loss level	Utility, Regulators	
	Real Loss Cost	Calculated by Free Water Audit Software	✓					✓	Assess loss cost level	Utility, Regulators	
	Unavoidable Annual Real Loss (UARL)	Calculated by Free Water Audit Software	✓					✓	Reveal theoretical technical low level of leakage	Utility, Regulators	
Volume	Unit Apparent Losses (vol/conn/day)	Strong and understandable indicator for multiple users.	✓	✓	✓	✓		✓	Used for performance tracking and target-setting	Utility, Regulators	
	Unit Real Losses ^A (vol/conn/day)	Strong and understandable indicator for multiple users.	✓	✓	✓	✓		✓	Used for performance tracking and target-setting	Utility, Regulators, Policy Makers	
	Unit Real Losses ^B (vol/pipeline length/day)	Strong and understandable indicator for use by utilities with low connection density.	✓	✓	✓	✓		✓	Data collection and assessment of systems with “low” connection density	Utility, Regulators, Policy Makers	
	Unit Total Losses (vol/conn/day) New KPI	Strong and understandable indicator, suitable for high-level performance measurement.	✓						✓	High level indicator for trending analysis. Not appropriate for target-setting or benchmarking	Utilities, Customers
	Infrastructure Leakage Index (ILI)	Robust, specialized ratio KPI; can be influenced by pressure and connection density.	✓	✓					✓	Benchmarking after pressure management is implemented	Utilities
Value	Apparent Loss Cost Rate (value/conn/year) New KPI	Indicators with sufficient technical rigor. Provide the unit financial value of each type of loss, which is useful for planning and assessment of cost efficiency of water loss reduction and control interventions and programs.	✓					✓	Data collection and assessment on AWWA indicators or contextual parameters to use in conjunction with Loss Cost Rates	Utilities, Regulators, Customers	
	Real Loss Cost Rate (value/conn/year) New KPI		✓					✓		Utilities, Regulators, Customers	
Validity	Data Validity Tier (DVT)	Strong indicator of water loss audit data quality, if data has been validated. Tier provides guidance on priority areas of activity.	✓	✓				✓	Assess caliber of data inputs of the water audit	Regulators, Utilities	

Silver Peak Water System Conservation Plan

Version 4; February 2021

AWWA Free Water Audit Software Water Balance		Water Audit Report for: Silver Peak Utilities				FWAS v6.0 American Water Works Association. Copyright © 2020, All Rights Reserved.
		Audit Year: 2019		Jun 28 2018 - Jun 26 2019		
		Data Validity Tier: Tier II (26-50)				
Volume from Own Sources (VOS) (corrected for known errors) 11.902	System Input Volume 11.902	Water Exported (WE) (corrected for known errors) 0.764	Billed Water Exported			Revenue Water (Exported) 0.764
		Water Supplied 11.138	Authorized Consumption 8.648	Billed Authorized Consumption 8.548	Billed Metered Consumption (BMAC) (water exported is removed) 8.548	Revenue Water 8.548
Water Imported (WI) (corrected for known errors) 0.000		Water Losses 2.490	Unbilled Authorized Consumption 0.100	Billed Unmetered Consumption (BUAC) 0.000	Non-Revenue Water (NRW) 2.590	
				Unbilled Metered Consumption (UMAC) 0.000		
			Apparent Losses 0.386	Unbilled Unmetered Consumption (UUAC) 0.100		
				Systematic Data Handling Errors (SDHE) 0.100		
				Customer Metering Inaccuracies (CMI) 0.264		
Real Losses 2.104	Unauthorized Consumption (UC) 0.021					
	Leakage on Transmission and/or Distribution Mains <i>Not broken down</i>					
	Leakage and Overflows at Utility's Storage Tanks <i>Not broken down</i>					
	Leakage on Service Connections <i>Not broken down</i>					

Silver Peak Water System Conservation Plan

Version 4; February 2021

FWAS v6.0
American Water Works Association.
Copyright © 2020, All Rights Reserved.

AWWA Free Water Audit Software: Determining Water Loss Standing

Water Audit Report for: **Silver Peak Utilites**

Audit Year: **2019** **Jun 28 2018 - Jun 26 2019**

Data Validity Tier: **Tier II (26-50)**

Water Loss Control Planning Guide

Water Audit Data Validity Tier (Score Range)

Functional Focus Area	Tier I (1-25)	Tier II (26-50)	Tier III (51-70)	Tier IV (71-90)	Tier V (91-100)
Audit Data Collection	Launch auditing and loss control team; address supply metering deficiencies	Analyze business process for customer metering and billing functions and water supply operations; Identify data gaps; improve supply metering	Establish/revise policies and procedures for data collection	Refine data collection practices and establish as routine business process	Annual water audit is a reliable gauge of year-to-year water efficiency standing
Short-term loss control	Research information on leak detection programs; Begin flowcharting analysis of customer billing system	Conduct loss assessment investigations on a sample portion of the system: customer meter testing, leak survey, unauthorized consumption, etc	Establish ongoing mechanisms for customer meter accuracy testing, active leakage control and infrastructure monitoring	Refine, enhance or expand ongoing programs based upon economic justification	Stay abreast of improvements in metering, meter reading, billing, leakage management and infrastructure rehabilitation
Long-term loss control		Begin to assess long-term needs requiring large expenditure: customer meter replacement, water main replacement program, new customer billing system or AMR/AMI system	Begin to assemble economic business case for long-term needs based upon improved data becoming available through the water audit process	Conduct detailed planning, budgeting and launch of comprehensive improvements for metering, billing or infrastructure management	Continue incremental improvements in short-term and long-term loss control interventions
Target-setting			Establish long-term apparent and real loss reduction goals (+10 year horizon)	Establish mid-range (5 year horizon) apparent and real loss reduction goals	Evaluate and refine loss control goals on a yearly basis
Benchmarking			Preliminary Comparisons - can begin to rely upon with PIs for performance comparisons for real losses	Performance Benchmarking with PIs is meaningful in comparing real loss standing	Identify Best Practices/ Best in class; PIs are very reliable as real loss performance indicators for best in class service

For validity scores of 50 or below, the shaded blocks should not be focus areas until better data validity is achieved.

APPENDIX C – WATER LOSS AUDIT FY 2020

Silver Peak Water System Conservation Plan

Version 4; February 2021



AWWA Free Water Audit Software v6.0

FWAS v6.0

American Water Works Association Copyright © 2020. All Rights Reserved.

This spreadsheet-based water audit tool is designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. It provides a "top-down" summary water audit format and is not meant to take the place of a full-scale, comprehensive water audit format. Auditors are strongly encouraged to refer to the most current edition of AWWA M36 Manual for Water Audits for detailed guidance on the water auditing process and targeting loss reduction levels. This tool contains several separate worksheets. Sheets can be accessed using the tabs at the bottom of the screen, or by clicking the TOC links below.

Table of Contents (TOC)

- Start Page** The current sheet. Enter contact information and basic audit details.
- Worksheet** Enter the required data on this worksheet to calculate the water balance and data grading.
- Interactive Data Grading** Answer questions about operational practices for each audit input, and the data validity grades will automatically populate.
- Dashboard** Review NRW components, performance indicators and graphical outputs to evaluate the results of the audit.
- Notes** Enter notes to explain how values were calculated, document data sources, and related information about data management practices.
- Blank Sheet** By popular demand! A blank sheet. The world is your canvas.
- Water Balance** The values entered in the Worksheet automatically populate the Water Balance.
- Loss Control Planning** Use this sheet to interpret the results of the audit validity score and performance indicators.
- Definitions** Use this sheet to understand the terms used in the audit process.
- Service Connection Diagram** Diagrams depicting possible customer service connection line configurations.
- Acknowledgements** Acknowledgements for development of the AWWA Free Water Audit Software v6.0.

AWWA Web Resources for Water Loss Control

<https://www.awwa.org/Resources-Tools/Resource-Topics/Water-Loss-Control>
 Items referenced in the Free Water Audit Software v6.0 on the web:
 Data Grading Matrix v6.0
 Example Water Audit v6.0
 Water Audit Compiler v6.0
 AWWA Reports on Performance Indicators
 M36 Manual

Enter Basic Information

Name of Utility:	Silver Peak Utilites
Name of Contact Person:	Michael Anderson
Email:	escopw@gmail.com
Telephone Ext.:	775-485-3483
City/Town/Municipality:	Silver Peak
State / Province:	Nevada (NV)
Country:	United States
Audit Preparation Date:	Feb 12 2021
Audit Year:	2020
Audit Year Label:	Fiscal (Fiscal, Calendar, etc)
Audit Period Start Date:	Jun 26 2019
Audit Period End Date:	Jun 24 2020
Volume Reporting Units:	Million gallons (US)
Water System Structure:	Retail
Water Type:	Other -----> Potable + Exported Raw
System ID Number:	NV0000363
Validator Name/ID:	n/a
Validator Email:	
Estimated Total Population Served by Water Utility:	150

Key of Input Acronyms

In order of appearance in the Worksheet

VOS	Volume from Own Sources
VOSEA	VOS Error Adjustment
WI	Water Imported
WIEA	WI Error Adjustment
WE	Water Exported
WEEA	WE Error Adjustment
BMAC	Billed Metered Authorized Consumption
BUAC	Billed Unmetered Authorized Consumption
UMAC	Unbilled Metered Authorized Consumption
UUAC	Unbilled Unmetered Authorized Consumption
SDHE	Systematic Data Handling Errors
CMI	Customer Metering Inaccuracies
UC	Unauthorized Consumption
Lm	Length of mains
Nc	Number of service connections
Lp	Average length of (private) customer service line
AOP	Average Operating Pressure
CRUC	Customer Retail Unit Charge
VPC	Variable Production Cost

Color Key

User input Calculated Optional default

Guidance for the Worksheet

Choosing to enter unit of **percent** or **volume** (applies to VOSEA, WIEA, WEEA, CMI)

choose entry option:

1.00%	percent	or	
	volume		25.000

Choosing to enter **default** or **custom input** (applies to UUAC, SDHE, UC)

choose entry option:

0.25%	default	or	
	custom		75.000

Guidance for the Interactive Data Grading

Use acronym buttons in IDG header to navigate among inputs. Acronym Key above. White = needs answers, orange = complete, clear = not required. Example below.

VOS	VOSEA	WI	WIEA	WE	WEEA	BMAC	BUAC	UMAC	UUAC
SDHE	CMI	UC	Lm	Nc	Lp	AOP	CRUC	VPC	

After clicking an acronym button, answer all visible questions in the order they're presented, choosing best-fit answer

Grade will populate when all visible questions are complete for an input

7

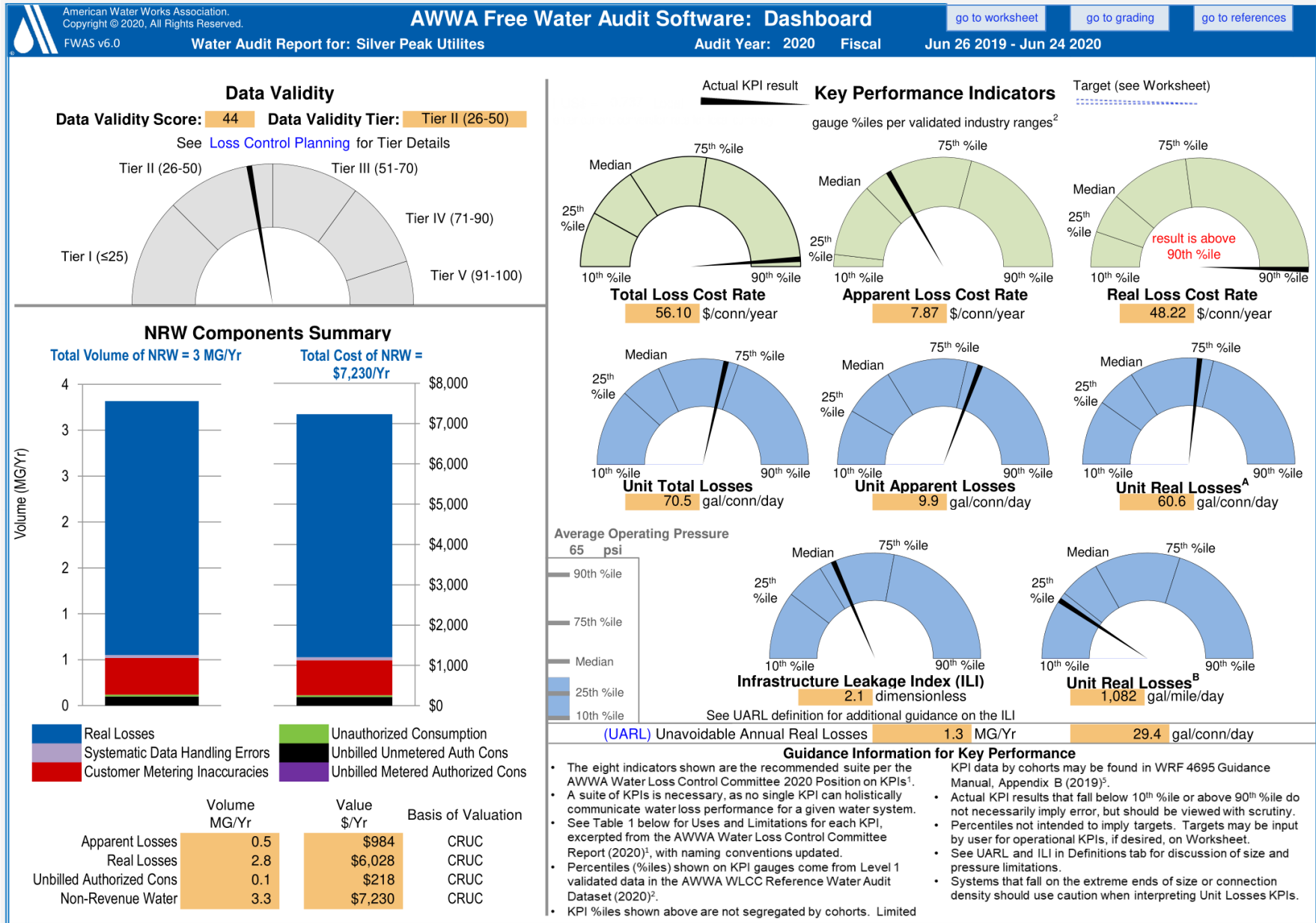
The limiting criteria will be labeled along the right. If only 1 limiting criterion is shown, improving on that criterion will achieve a higher data grade. If multiple limiting criteria are shown, improving on *each* limiting criterion is necessary to achieve a higher data grade. A complete inventory of data grading criteria is available in the Data Grading Matrix v6.0 (see web resources)

Limiting

If you have questions or comments regarding this software please contact us at: wlc@awwa.org

Silver Peak Water System Conservation Plan

Version 4; February 2021



Silver Peak Water System Conservation Plan


Version 4; February 2021

Table 1 Source: AWWA Water Loss Control Committee Report (2020)¹, with naming conventions updated
2020 AWWA Water Audit Method – Water Audit Outputs and Key Performance Indicators: Uses and Limitations

Type	Indicator	Description	Suitable Purposes					Uses and Limitations	Principal Users		
			Assessment	Bench-Marking	Target-Setting	Planning	Tracking				
Attribute	Apparent Loss Volume	Calculated by Free Water Audit Software	✓					✓	Assess loss level	Utility, Regulators	
	Apparent Loss Cost	Calculated by Free Water Audit Software	✓					✓	Assess cost loss level	Utility, Regulators	
	Real Loss Volume	Calculated by Free Water Audit Software	✓					✓	Assess loss level	Utility, Regulators	
	Real Loss Cost	Calculated by Free Water Audit Software	✓					✓	Assess loss cost level	Utility, Regulators	
	Unavoidable Annual Real Loss (UARL)	Calculated by Free Water Audit Software	✓					✓	Reveal theoretical technical low level of leakage	Utility, Regulators	
Volume	Unit Apparent Losses (vol/conn/day)	Strong and understandable indicator for multiple users.	✓	✓	✓	✓		✓	Used for performance tracking and target-setting	Utility, Regulators	
	Unit Real Losses ^A (vol/conn/day)	Strong and understandable indicator for multiple users.	✓	✓	✓	✓		✓	Used for performance tracking and target-setting	Utility, Regulators, Policy Makers	
	Unit Real Losses ^B (vol/pipeline length/day)	Strong and understandable indicator for use by utilities with low connection density.	✓	✓	✓	✓		✓	Data collection and assessment of systems with “low” connection density	Utility, Regulators, Policy Makers	
	Unit Total Losses (vol/conn/day) New KPI	Strong and understandable indicator, suitable for high-level performance measurement.	✓						✓	High level indicator for trending analysis. Not appropriate for target-setting or benchmarking	Utilities, Customers
	Infrastructure Leakage Index (ILI)	Robust, specialized ratio KPI; can be influenced by pressure and connection density.	✓	✓					✓	Benchmarking after pressure management is implemented	Utilities
Value	Apparent Loss Cost Rate (value/conn/year) New KPI	Indicators with sufficient technical rigor. Provide the unit financial value of each type of loss, which is useful for planning and assessment of cost efficiency of water loss reduction and control interventions and programs.	✓				✓	✓	Data collection and assessment on AWWA indicators or contextual parameters to use in conjunction with Loss Cost Rates	Utilities, Regulators, Customers	
	Real Loss Cost Rate (value/conn/year) New KPI		✓				✓	✓		Utilities, Regulators, Customers	
Validity	Data Validity Tier (DVT)	Strong indicator of water loss audit data quality, if data has been validated. Tier provides guidance on priority areas of activity.	✓	✓			✓	✓	Assess caliber of data inputs of the water audit	Regulators, Utilities	


Silver Peak Water System Conservation Plan

Version 4; February 2021

AWWA Free Water Audit Software Water Balance		Water Audit Report for: Silver Peak Utilities				FWAS v6.0 American Water Works Association. Copyright © 2020, All Rights Reserved.
		Audit Year: 2020		Jun 26 2019 - Jun 24 2020		
		Data Validity Tier: Tier II (26-50)				
Volume from Own Sources (VOS) (corrected for known errors) 11.905	System Input Volume 11.905	Water Exported (WE) (corrected for known errors) 0.997	Billed Water Exported			Revenue Water (Exported) 0.997
		Water Supplied 10.908	Authorized Consumption 7.691	Billed Authorized Consumption 7.591	Billed Metered Consumption (BMAC) (water exported is removed) 7.591	Revenue Water 7.591
Water Losses 3.217	Unbilled Authorized Consumption 0.100			Billed Unmetered Consumption (BUAC) 0.000	Non-Revenue Water (NRW) 3.317	
	Real Losses 2.765	Apparent Losses 0.451	Unbilled Unmetered Consumption (UUAC) 0.100			
Water Imported (WI) (corrected for known errors) 0.000					Systematic Data Handling Errors (SDHE) 0.033	
	Customer Metering Inaccuracies (CMI) 0.400					
	Unauthorized Consumption (UC) 0.019					
				Leakage on Transmission and/or Distribution Mains <i>Not broken down</i>		
				Leakage and Overflows at Utility's Storage Tanks <i>Not broken down</i>		
				Leakage on Service Connections <i>Not broken down</i>		

Silver Peak Water System Conservation Plan

Version 4; February 2021



AWWA Free Water Audit Software: Determining Water Loss Standing

FWAS v6.0
American Water Works Association.
Copyright © 2020. All Rights Reserved.

Water Audit Report for: Silver Peak Utilites

Audit Year: 2020 Jun 26 2019 - Jun 24 2020

Data Validity Tier: Tier II (26-50)

Water Loss Control Planning Guide					
Water Audit Data Validity Tier (Score Range)					
Functional Focus Area	Tier I (1-25)	Tier II (26-50)	Tier III (51-70)	Tier IV (71-90)	Tier V (91-100)
Audit Data Collection	Launch auditing and loss control team; address supply metering deficiencies	Analyze business process for customer metering and billing functions and water supply operations; Identify data gaps; improve supply metering	Establish/revise policies and procedures for data collection	Refine data collection practices and establish as routine business process	Annual water audit is a reliable gauge of year-to-year water efficiency standing
Short-term loss control	Research information on leak detection programs; Begin flowcharting analysis of customer billing system	Conduct loss assessment investigations on a sample portion of the system: customer meter testing, leak survey, unauthorized consumption, etc	Establish ongoing mechanisms for customer meter accuracy testing, active leakage control and infrastructure monitoring	Refine, enhance or expand ongoing programs based upon economic justification	Stay abreast of improvements in metering, meter reading, billing, leakage management and infrastructure rehabilitation
Long-term loss control		Begin to assess long-term needs requiring large expenditure: customer meter replacement, water main replacement program, new customer billing system or AMR/AMI system	Begin to assemble economic business case for long-term needs based upon improved data becoming available through the water audit process	Conduct detailed planning, budgeting and launch of comprehensive improvements for metering, billing or infrastructure management	Continue incremental improvements in short-term and long-term loss control interventions
Target-setting			Establish long-term apparent and real loss reduction goals (+10 year horizon)	Establish mid-range (5 year horizon) apparent and real loss reduction goals	Evaluate and refine loss control goals on a yearly basis
Benchmarking			Preliminary Comparisons - can begin to rely upon with PIs for performance comparisons for real losses	Performance Benchmarking with PIs is meaningful in comparing real loss standing	Identify Best Practices/ Best in class; PIs are very reliable as real loss performance indicators for best in class service

For validity scores of 50 or below, the shaded blocks should not be focus areas until better data validity is achieved.

**APPENDIX D – NON-REVENUE WATER CALCULATION NRS
540.145**

Silver Peak Water System's Non-revenue Water (NRW) is calculated by summing the pumpage between Well No. 2 and 4 during each billing/usage period, and finding the difference between this sum and each billing/usage period's authorized consumption. Due to the water being metered before being pumped into the supply tank, and said supply tank not having a meter, there will be a discrepancy between the actual water supplied and the pumpage sum. This discrepancy is lessened when NRW is examined annually. In the future, tank height data may be used to account for this discrepancy.

Silver Peak Utilities Non-revenue Water Calculation

		Water Supplied	Billed Metered Usage	Corrected Usage	Non-revenue Water
2019		Monthly Pumped Water	Monthly Billed or Corrected Usage	Non-revenue Water	
12/19/2018	1/22/2019	1100100 gal	790260 gal	309840 gal	
1/22/2019	2/21/2019	562300 gal	388118 gal	174182 gal	
2/21/2019	3/21/2019	563800 gal	392280 gal	171520 gal	
3/21/2019	4/24/2019	691600 gal	542847 gal	148753 gal	
4/24/2019	5/26/2019	799600 gal	584724 gal	214876 gal	
5/26/2019	6/26/2019	1109200 gal	874428 gal	234772 gal	
6/26/2019	7/25/2019	1357300 gal	1118102 gal	239198 gal	
7/25/2019	8/22/2019	1282700 gal	951973 gal	330727 gal	
8/22/2019	9/23/2019	1339400 gal	1045100 gal	294300 gal	
9/23/2019	10/23/2019	1080100 gal	584134 gal	495966 gal	
10/23/2019	11/21/2019	673800 gal	385196 gal	288604 gal	
11/21/2019	12/20/2019	670500 gal	345931 gal	324569 gal	

Yearly Total		Yearly Pumped Water	Yearly Billed and Corrected Usage	Non-revenue Water
12/19/2018	12/20/2019	11230400 gal	8003093 gal	3227307 gal

2020		Monthly Pumped Water	Monthly Billed or Corrected Usage	Non-revenue Water
12/24/2019	1/24/2020	700100 gal	516564 gal	183536 gal
1/24/2020	2/27/2020	562700 gal	398294 gal	164406 gal
2/27/2020	3/25/2020	463700 gal	345291 gal	118409 gal
3/25/2020	4/23/2020	535900 gal	375369 gal	160531 gal
4/23/2020	5/24/2020	1057200 gal	767329 gal	289871 gal
5/24/2020	6/24/2020	1184600 gal	791137 gal	393463 gal
6/24/2020	7/26/2020	1334800 gal	1023157 gal	311643 gal
7/26/2020	8/26/2020	1391500 gal	1092047 gal	299453 gal
8/26/2020	9/26/2020	1104900 gal	790450 gal	314450 gal
9/26/2020	10/26/2020	800800 gal	607192 gal	193608 gal
10/26/2020	11/20/2020	992800 gal	543123 gal	449677 gal
11/20/2020	12/21/2020	507100 gal	476700 gal	30400 gal

Yearly Total		Yearly Pumped Water	Yearly Billed and Corrected Usage	Non-revenue Water
12/24/2019	12/21/2020	10636100 gal	7726653 gal	2909447 gal

Silver Peak Utilities Non-revenue Water Calculation

		Water Supplied	Billed Metered Usage	Corrected Usage	Non-revenue Water
FY 2019		Monthly Pumped Water	Monthly Billed Usage		Non-revenue Water
6/28/2018	7/27/2018	1393800 gal	1053198 gal		340602 gal
7/27/2018	8/27/2018	1395200 gal	988202 gal		406998 gal
8/27/2018	9/23/2018	1203200 gal	1029134 gal		174066 gal
9/23/2018	10/23/2018	823500 gal	693172 gal		130328 gal
10/23/2018	11/20/2018	811200 gal	628608 gal		182592 gal
11/20/2018	12/18/2018	684300 gal	583276 gal		101024 gal
12/18/2018	1/22/2019	1100100 gal	790260 gal		309840 gal
1/22/2019	2/21/2019	562300 gal	388118 gal		174182 gal
2/21/2019	3/21/2019	563800 gal	392280 gal		171520 gal
3/21/2019	4/24/2019	691600 gal	542847 gal		148753 gal
4/24/2019	5/26/2019	799600 gal	584724 gal		214876 gal
5/26/2019	6/26/2019	1109200 gal	874428 gal		234772 gal
Yearly Total		Yearly Pumped Water	Yearly Billed Usage		Non-revenue Water
6/28/2018	6/26/2019	11137800 gal	8548247 gal		2589553 gal
FY 2020		Monthly Pumped Water	Monthly Corrected Usage		Non-revenue Water
6/26/2019	7/25/2019	1357300 gal	1118102 gal		239198 gal
7/25/2019	8/22/2019	1282700 gal	951973 gal		330727 gal
8/22/2019	9/23/2019	1339400 gal	1045100 gal		294300 gal
9/23/2019	10/23/2019	1080100 gal	584134 gal		495966 gal
10/23/2019	11/21/2019	673800 gal	385196 gal		288604 gal
11/21/2019	12/20/2019	670500 gal	345931 gal		324569 gal
12/20/2019	1/24/2020	700100 gal	516564 gal		183536 gal
1/24/2020	2/27/2020	562700 gal	398294 gal		164406 gal
2/27/2020	3/25/2020	463700 gal	345291 gal		118409 gal
3/25/2020	4/23/2020	535900 gal	375369 gal		160531 gal
4/23/2020	5/24/2020	1057200 gal	767329 gal		289871 gal
5/24/2020	6/24/2020	1184600 gal	791137 gal		393463 gal
Yearly Total		Yearly Pumped Water	Yearly Corrected Usage		Non-revenue Water
6/26/2019	6/24/2020	10908000 gal	7624420 gal		3283580 gal

APPENDIX E – PUBLIC EDUCATION MATERIALS

There are several publications available for use at the 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 **Silver Peak Water System** develops system-specific publications.

There are also numerous websites 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 F – 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.

Silver Peak Water System Conservation Plan

Version 4; February 2021

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
Water-use regulation	Hot water demand units	10 gpcpd
	Landscape requirements for new developments	10 – 20 % in sector
	Greywater reuse, residential	20 – 30 gpcpd