LAKE TAHOE NEVADA STATE PARKS
NEVADA DIVISION OF STATE PARKS

WATER CONSERVATION PLAN

2019

Public Water System ID#'s
PWS#4041- Spooner Lake State Park
PWS#950 – Memorial Point Rest Area
PWS#746 – Sand Harbor State Park

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Introduction:

Lake Tahoe Nevada State Parks operates three permitted, transient, non-community public water systems. System ID#'s, source types, and source locations are as follows:

Water Sources and Water System ID- LTNSP		
Water System ID#	Water Source ID#	Coordinates
PWS#4041- Spooner Lake	1 groundwater well	Township:14N Range:18E Section:2 1/4 section: NE ¼-1/4 Section: SE
PWS#950 – Memorial Point	1 groundwater well	Township:16N Range:18E Section:35 1/4 section: NW ¼-1/4 Section: SE
PWS#746 – Sand Harbor	1 groundwater well	Township:15N Range:18E Section:2 1/4 section: NW ¼-1/4 Section: NW

The Spooner Lake water system (PWS#4041) has a five-year average annual water usage of approximately 165,000 gallons and accommodates roughly 120,000 visitors per year. The system has three service connections at a restroom facility, a small concession area, and an office. There are several drinking fountains and yard hydrants for public use. There is also extremely limited irrigation that is limited to hand watering of small sections of landscaping. The system is fed from a well that pumps 32GPM into a 5,500-gallon pressure tank. The normal operating level is approx. 2,500 gallons. As the pressure tank is located at the bottom of a hill approx. 80 feet in elevation below most service connections, tank pressure is maintained between 90psi and 100psi. This allows a normal operating pressure of between 35psi and 45psi at most service connections. Water usage is metered at the well head. An hour meter is also located at the well control and is used to verify the efficiency of the well pump.

The Memorial Point water system (PWS#950) has a five-year average annual water usage of approximately 316,000 gallons and accommodates roughly 230,000 visitors per year. The system has a single service connection that supplies a four-unit restroom facility and a drinking fountain. A small automatic drip irrigation system is in place for a limited area of landscaping in front of the building during the summer months. The system is fed from a 16GPM well pump into two 50-gallon pressure tanks. System pressure is maintained at 45psi. Water usage is metered at the inlet of the pressure tanks and a separate meter is located on the supply line to the irrigation system.

The Sand Harbor water system (PWS#746) has a five-year average annual water usage of approximately 2,153,000 gallons and accommodates roughly 530,000 visitors per year and 8 permanent residents. The system has 16 service connections that supply 8 restroom facilities, 2 single family residences, a shop building, an office unit, a visitor center with two restrooms, an outdoor covered pavilion, a stage facility, and a restaurant/concession area. There are 4 separate automatic drip irrigation systems for landscaped areas during the summer months. There are also numerous public drinking fountains throughout the park. A 60GPM well pump feeds a 5,000-gallon pressure tank. The normal operating level is approx. 3,000 gallons and tank pressure is maintained at 60psi, which allows for a pressure of 35 psi at the highest elevation service connections. Water usage is metered at the pressure tank inlet. An hour meter is also located at the well control and is used to verify the efficiency of the well pump.

METHODS OF PUBLIC EDUCATION:

Increase Public Awareness of Limited Water in Nevada:
Public education to increase the awareness of the limited availability of water in Nevada is accomplished through park signage where applicable. As virtually all public access water fixtures located in the parks are of the automatic shut-off type (spring loaded water spigots and hose bibs, timed and vacuum assisted cold water shower valves, automatic shut-off drinking fountains, etc.), very little effort has been invested in a public education campaign. Park staff and permanent residents are trained and educated in the conservation and best uses of available water through staff meetings and a yearly park orientation.

Encourage Reduction of Lawn and Incorporate the Use of Arid Climate Plants:
Public access to water is restricted to sanitation and consumption. Park staff maintains vegetation and landscaping in order to ensure the best use of available water. Most landscaped areas incorporate regionally native vegetation. Landscaping and vegetation plans are generally carried out through the State Parks Planning and Development Section and/or a certified arborist employed by the park as a Park Ranger. Tahoe Regional Planning Agency guidelines are also followed for all new landscaping projects.

CONSERVATION MEASURES/MANAGEMENT OF WATER:

Conservation measures taken at the LTNSP include conversion of toilet and urinal fixture flush valves to low gpf units, generally 1.0 gpf for urinals and 1.6gpf for toilets. We have also installed several "waterless" urinals in one of our restroom buildings and are evaluating their performance. Installation of automatic drip irrigation has replaced sprinkler systems and are much more efficient. Hand watering of trees and shrubs where drip irrigation is not available is also employed instead of sprinkler systems. Shower facilities in the park and at the park residences use low flow shower heads. Spring loaded hose bibs and spigots are employed in most public access areas to prevent water from being left on. Most special events are required to provide portable toilet units that are pumped and do not use water. Water conservation amount estimates are shown in the following table:

Conservation Measure	Est. annual water usage per measure instituted (gallons)	Est. annual water usage w/out measure instituted (gallons)	Est. annual water conserved per measure (gallons)	Avg. visitors per day	Avg. est. water conserved per day (gallons)	Gallons conserved/person/ day
Low flow water fixtures (toilets (50) and urinals(14))	1,548,800	2,816,000	1,267,200	2,411	3,472	1.44
Installation of "waterless" urinals (2)	0	19,000	19,000	2,411	52	0.02
Drip irrigation vs. sprinkler systems	560,000	800,000	240,000	2,411	658	0.27
Hand watering vs. sprinklers	3,000	4,615	1,615	2,411	4	0.002
Low flow shower heads (26)	12,500	25,000	12,500	2,411	34	0.01
Automatic shutoff hose bibs and spigots (6)	200,000	250,000	50,000	2,411	137	0.06
Potable toilet usage for special events	0	11,000	11,000	2,411	30	0.01
TOTAL	2,324,300	3,925,615	1,601,315	2,411	4,387	1.82

Management of the three water systems is the responsibility of the park's maintenance staff, who monitor system pressures and meter fluctuations for any signs of abnormal operation or aberrant water use. All staff is alert for leakage and improperly functioning fixtures (examples include: stuck open shower valves, running toilets and sinks, etc.) Appropriate measures will be immediately undertaken to correct any situations that might result in system water loss or waste.

Management schedule for the water systems include:

Daily

- All park staff to remain observant for water leaks and malfunctioning fixtures in facilities and the immediate vicinity of water system components

Weekly

- Monitor pressure gauges and metering devices to ensure normal function of systems
- Note and report any unusually high water use and identify and repair casual factors

Monthly

- Record water use figures and note and report any abnormalities to maintenance supervisor

Quarterly

- Compare water use records of past years to identify abnormal usage, verify against visitation figures during the same periods

Fall/Spring

- Winterize/de-winterize all facilities, drinking fountains, flush toilets, and showers that are at risk for freeze damage and subsequent waste of water

Increase the Use of Effluent: N/A

All waste water is required by law to be disposed of outside of the Lake Tahoe Basin. Sewage from Sand Harbor and Memorial Point is piped to the Incline Village GID treatment plant. Spooner Lake operates a waste water treatment plant that exports into the IVGID effluent pipeline.

DROUGHT CONTINGENCY:

As all three water systems are supplied through groundwater pumped from isolated wells that are not under the influence of surface water, water table static levels tend to be fairly stable. During periods of extreme drought, where the water table does drop enough to affect the wells, several measures are instituted. All irrigation is suspended, bathroom facilities are shut down and portable toilets are brought in, hose bibs are shut down, and the park residents are informed of the need for extreme water conservation. The Memorial Point restrooms are closed and portable toilets replace the facility. LTNSP also maintains a contract with a Well Services provider that can be utilized to perform emergency repairs to the well, pressure tanks, controls, or well casing. Parks Planning and Development department will also be called to evaluate any proposed needed well deepening, modification, or new well drilling.

Sand Harbor and Spooner Lake system storage tanks are sufficient to provide several days of drinking water and supply to the two park residences. Memorial Point has no such storage capacity so facility is closed if necessitated. In the extent of an extended power outage, facilities at Spooner Lake and Memorial Point are closed until system pressure and operating supply are restored. The Sand Harbor system has a back-up emergency generator that supplies emergency power to the well, sewage lift stations, and fire system.

PLAN SCHEDULE:

All components of plan are currently in place.

WATER METER INSTALLATION PLANS:

As the three water systems are classified as Transient Non-community systems with no paying customers, there are currently no plans to install meters at any service connections.

STANDARDS FOR WATER EFFICIENCY FOR NEW DEVELOPEMENT:

For any new structures the following standards shall be applied:

The Energy Policy Act of 1992 requires all U.S. plumbing manufacturers and importers to meet or beat the following water-efficiency standards:

- Faucets: 2.5 gallons per minute
- Metered valve faucets: 0.25 gallons per cycle
- Showerheads: 2.5 gallons per minute
- Toilets: 1.6 gallons per flush
- Urinals: 1.0 gallons per flush

Any modified or new irrigation systems shall use automated drip irrigation systems. Any other vegetation shall be hand watered.

TIERED RATE STRUCTURE IMPLEMENTAION: N/A

As the three water systems are classified as Transient Non-community systems with no paying customers, there are currently no plans to implement a tiered rate structure.

WATERING RESTRICTIONS BASED ON THE TIME OF DAY AND DAY OF THE WEEK:

As all three water systems are maintained by State Parks Staff, all irrigation and watering shall occur in the morning or late evening hours of odd numbered days. We do not plan on limiting hand watering of trees and shrubbery as the affected areas include a very small number of newly planted flora that do not require irrigation after it is established.

EVALUATION OF PLAN EFFECTIVENESS:

Plan effectiveness is best determined by comparison of water use totals from similar periods. Quarterly comparison of water consumed to previous similar periods, with respect to park visitation, is a solid indicator of plan effectiveness. As the three systems are very limited in their size and scope, with visitation being the largest variable for water usage, abnormalities in the systems usually are readily apparent. The small system sizes also allow for easy isolation of suspected trouble spots that tend to make troubleshooting and repair of leaks much more timely than in larger more complex systems.

This water conservation plan is to be kept at the Sand Harbor State Park and made available to any interested party.