South Tahoe Public Utility District

Tahoe Valley South Subbasin (6-5.01) Annual Report

2015 Water Year

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Contents

1 Introduction

This 2015 Annual Report presents a brief management level summary of groundwater conditions in the Tahoe Valley South Subbasin (6-5.01), herein referred to as the TVS Basin (Figure 1). This annual summary is provided in order to track progress on the groundwater management process implemented by the South Tahoe Public Utility District (District) in collaboration with the Stakeholders Advisory Group (SAG). The SAG consists of members who reside within the TVS Basin or who represent collaborating businesses or government agencies who have demonstrated a commitment to protecting groundwater resources.

The 2015 Annual Report provides monitoring data for the 2015 Water Year, which is the 12-month period starting October 1st of 2014 through September 30th of 2015 (2015 WY). Below normal precipitation levels during the current 2012 -2015 state-wide drought event (2012-2015 drought) continued in the Lake Tahoe Basin, with historically low snow pack accumulations across the Sierra Nevada Region. In response to the drought, the State Water Resources Control Board (SWRCB) amended and readopted an emergency conservation regulation in May 2015 (SWRCB Emergency Conservation Regulation) ordering all urban water suppliers to implement mandatory restrictions on outdoor irrigation, which resulted in below normal water demands.

During the 2012-2015 drought, groundwater elevations within the TVS Basin have generally declined, on average, at a rate of -1.1 feet per water year. However, groundwater levels as of spring 2015 remained within the historical range of water level elevations measured during the ten year period preceding the drought (2001 – 2011), at the majority of observation wells used for groundwater elevation monitoring. The decline in groundwater elevations during the 2012-2015 drought, are attributed primarily to the reduced precipitation and collateral decline in groundwater recharge to the TVS Basin. Using the average change in groundwater elevations measured in basin observation wells, the estimated change in groundwater storage is calculated at about -1,455 acre-feet (AF) to -2,560 AF during the 2015 WY. This is believed to represent a decline of less than 2% of the total volume of groundwater stored in the basin aquifer.

Groundwater management activities implemented during the 2015 WY are described in Section 3 of this report. These generally include items required for on-going compliance with the Sustainable Groundwater Management Act (SGMA) and project initiation to address actions under the 2014 GWMP Implementation Plan.

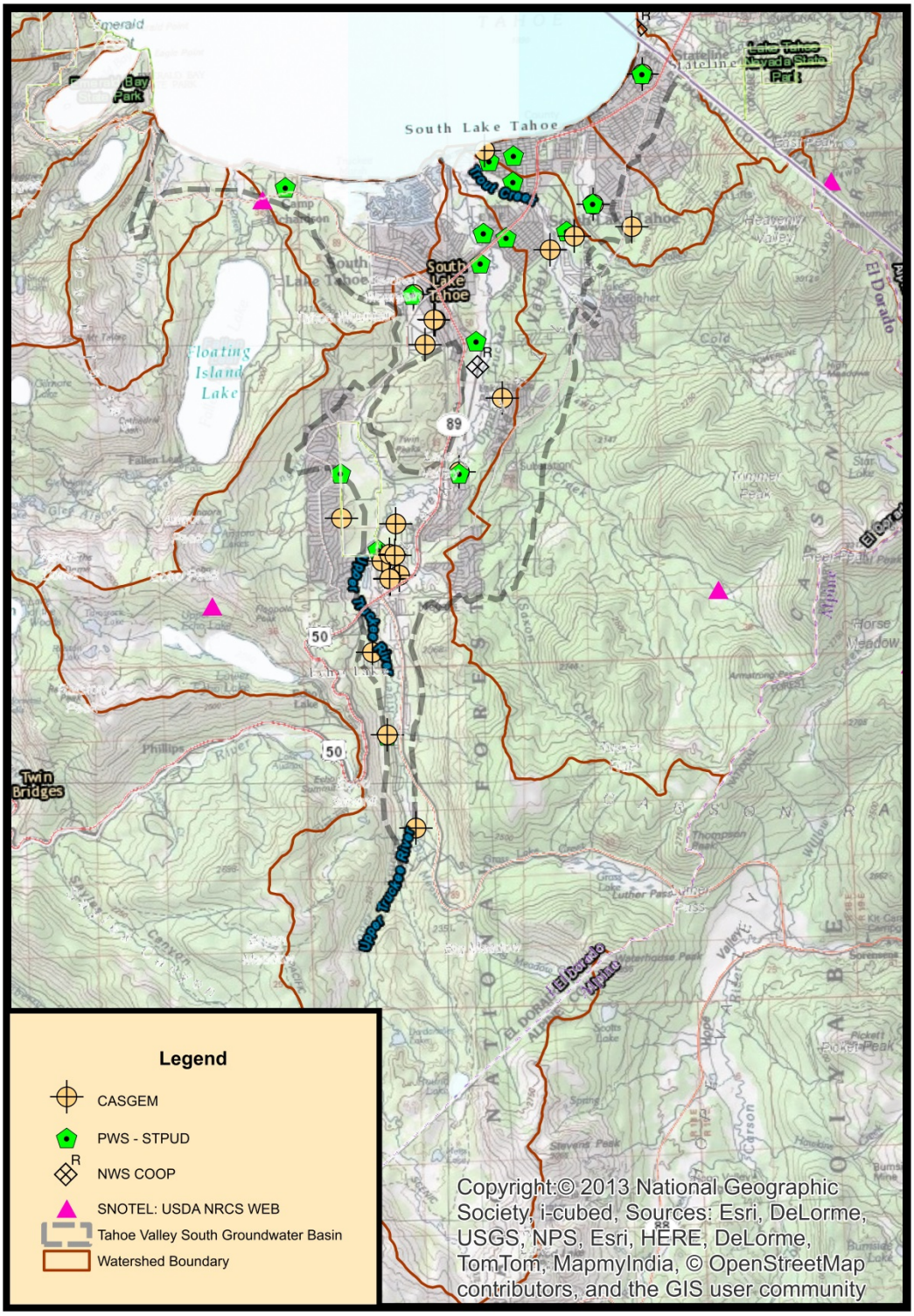

Figure 1. TVS Basin showing CASGEM observation wells, District public water supply wells; and groundwater basin and contributing watershed boundaries.

2 Basin Monitoring

The following section presents data collected by the District to show the current state of groundwater conditions within the TVS Basin.

2.1 Precipitation

Annual precipitation records from National Weather Service Cooperative Observer (NWS COOP) Stations located in the Lake Tahoe Basin are provided in Figure 2. The Tahoe City Station (NWS COOP 48758) has the longest period of record of any weather station in the Lake Tahoe Basin and is located along the west shore of Lake Tahoe approximately 17 miles north of the City of South Lake Tahoe. The Glenbrook Station (NWS COOP 263205) has the second longest period of record and is located along the east shore of Lake Tahoe, approximately 13 miles north of the City of South Lake Tahoe. The South Lake Tahoe Station (NWS COOP 048762) has a relatively limited record, but is used to show the precipitation recorded directly within the TVS Basin.

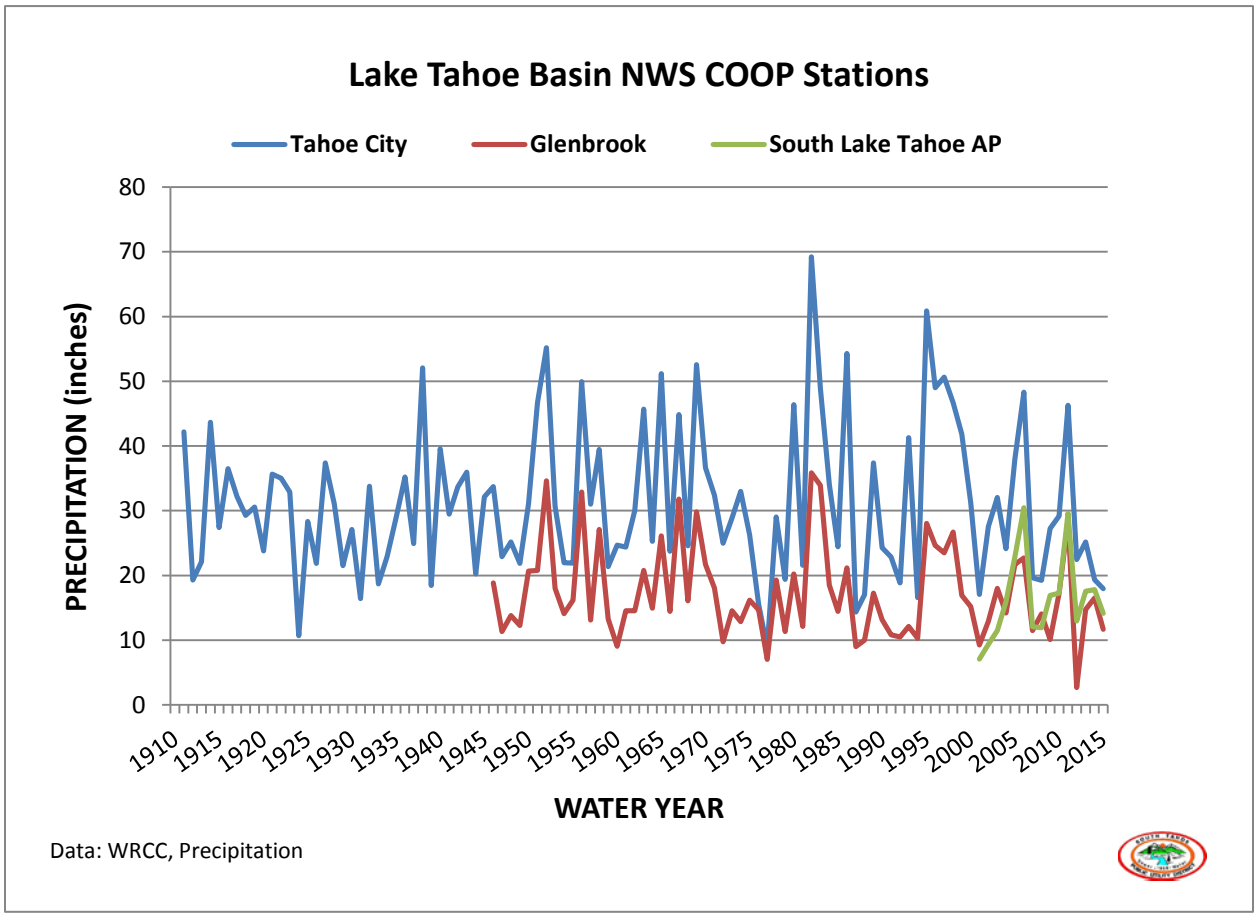

Figure 2. Annual precipitation recorded at selected NWS COOP Stations in the Lake Tahoe Basin. Total annual precipitation reported at the Glenbrook Station for the 2012 WY is based on an incomplete record.

A summary of the wettest and driest water years, and the total annual precipitation for the 2015 WY, as a percentage of each stations long-term average are provided below in Table 1.

NWS COOP	Period of Record (Water Years)	Long-Term Average Precipitation (inches)	Wettest Water Year (WY/ % of Avg.)	Driest Water Year (WY/ % of Avg.)	2015 Water Year (in/% of Avg.)
Tahoe City (48758)	1911 – 2015	31.16	1982/ 222%	1977/ 28%	17.94/58%
Glenbrook (263205)	1945-2015	17.36	1982/ 207%	[1]1977/ 41%	11.70/67%
SLT AP (048762)	2001-2015	16.50	2006/ 185%	[2]2001/ 43%	14.17/86%

Table 1. Relative changes in precipitation during the 2015 WY for the Lake Tahoe Basin.

[1]Precipitation records measured at the Glenbrook Station for the 2012 Water Year are incomplete; therefore the 1977 WY is used as the driest water year on record for this station.

[2]The period of record for the South Lake Tahoe Station starts during the 2001 Water Year, therefore the driest water year on record for this station does not match the other sites.

Inspection of the long term records shows that the decline in total precipitation during the 2015 WY is below normal. For their respective periods of record, total annual precipitation during the 2015 WY is below the 10th percentile level at the Tahoe City Station; at about the 20th percentile level at the Glenbrook Station; and at about the 44th percentile level at the South Lake Tahoe Station.

Using the long-term records, the total precipitation during the 2015 WY is 14.8 inches, which is 63% of the long-term average for these stations.

2.1.1 Snow Pack

The majority of precipitation in the Lake Tahoe Basin is in the form of snow. Monthly snow telemetry (SNOTEL) station data (aggregated to annual totals) for the Echo Peak, CA (SNOTEL 463); Hagan's Meadow (SNOTEL 508); and Heavenly Valley (SNOTEL 518) stations are provided in Figure 3. The Echo Peak Station is located along the east slope of the Crystal Range, west of the TVS Basin within the Upper Truckee Watershed, at an elevation of 7,670 feet above mean sea level (famsl). The Hagan's Meadow Station is located along the west slope of the Carson Range south of the TVS Basin within the Trout Creek watershed, at an elevation of 7,776 famsl. The Heavenly Valley Station is located along the east slope of the Carson Range southeast of the TVS Basin within the Zephyr Cove watershed, at an elevation of 8,582 famsl. Snow water equivalent data from these stations is used to show the amount of precipitation in snow pack stored in the contributing watersheds neighboring the TVS Basin.

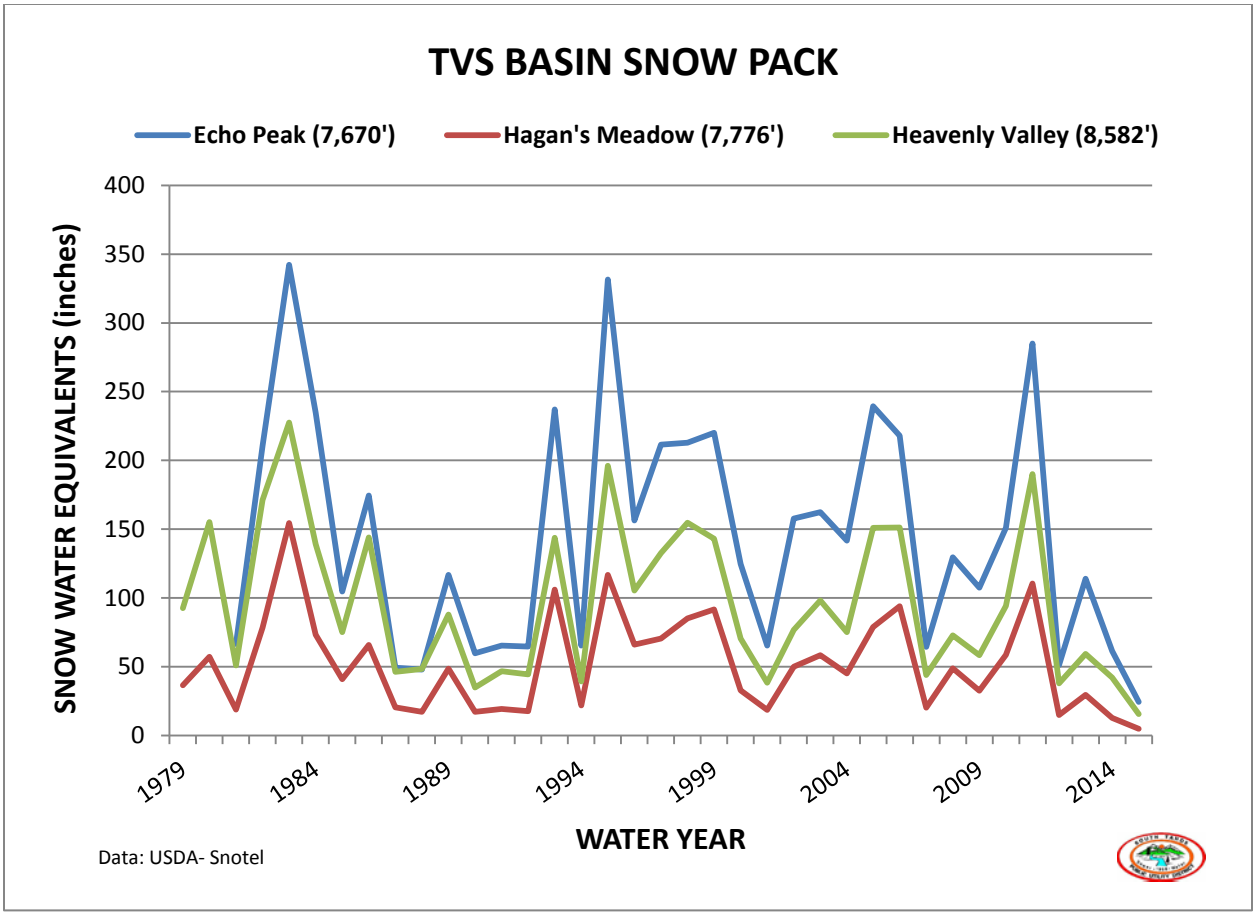

Figure 3. Annual precipitation (in snow water equivalents) from SNOTEL station readings located within the contributing watersheds surrounding the TVS Basin.

A summary of the wettest and driest water years; and the total annual precipitation in terms of snow water equivalents for the 2015 WY, as a percentage of each station's long-term average are provided below in Table 2.

SNOTEL	Elevation	Period of Record (Water Years)	Long-Term Average Snow Water Equivalents (inches)	Wettest Water Year (WY/ % of Avg.)	Driest Water Year (WY/ % of Avg.)	2015 Water Year (in/% of Avg.)
Echo Peak (463)	7,670	1981- 2015	141	1983/ 242%	2015/ 19%	24.4/19%
Hagan's Meadow (508)	7,776	1981-2015	52	1983/ 295%	2015/9%	4.9/9%
Heavenly Valley (518)	8,582	1979 - 2015	94	1983/242%	2015/17%	15.5/17%

Table 2. Snow water content changes in terms of percent of long-term average.

Inspection of Table 2 indicates that the reductions in snow pack during the 2015 WY are historic. For all stations and their respective periods of record, the 2015 WY is the driest with the lowest snow water equivalent readings on record. Using these records, the total snow pack, in snow water equivalents, during the 2015 WY is 14.9 inches, which is 15% of the average for these stations. This is consistent with regional readings across the Sierra Nevada Range, which was 5% of normal (April 1).

2.2 Groundwater Levels

The District has been regularly monitoring groundwater elevations from more than forty-five wells located in the TVS Basin since spring 2001. Approximately thirty of these wells are observation wells that are included in the California Statewide Groundwater Elevation Monitoring (CASGEM) Program. Hand readings are collected from all wells in May and November of each year. A smaller number of observation wells (13) are fitted with dedicated water-level monitoring equipment. The data loggers are programmed to collect pressure head and temperature readings at 6:00 AM and 6:00 PM on a daily basis to provide a continuous record of groundwater elevations within the TVS Basin. Hydrographs for four of these wells are provided below in Figure 4.

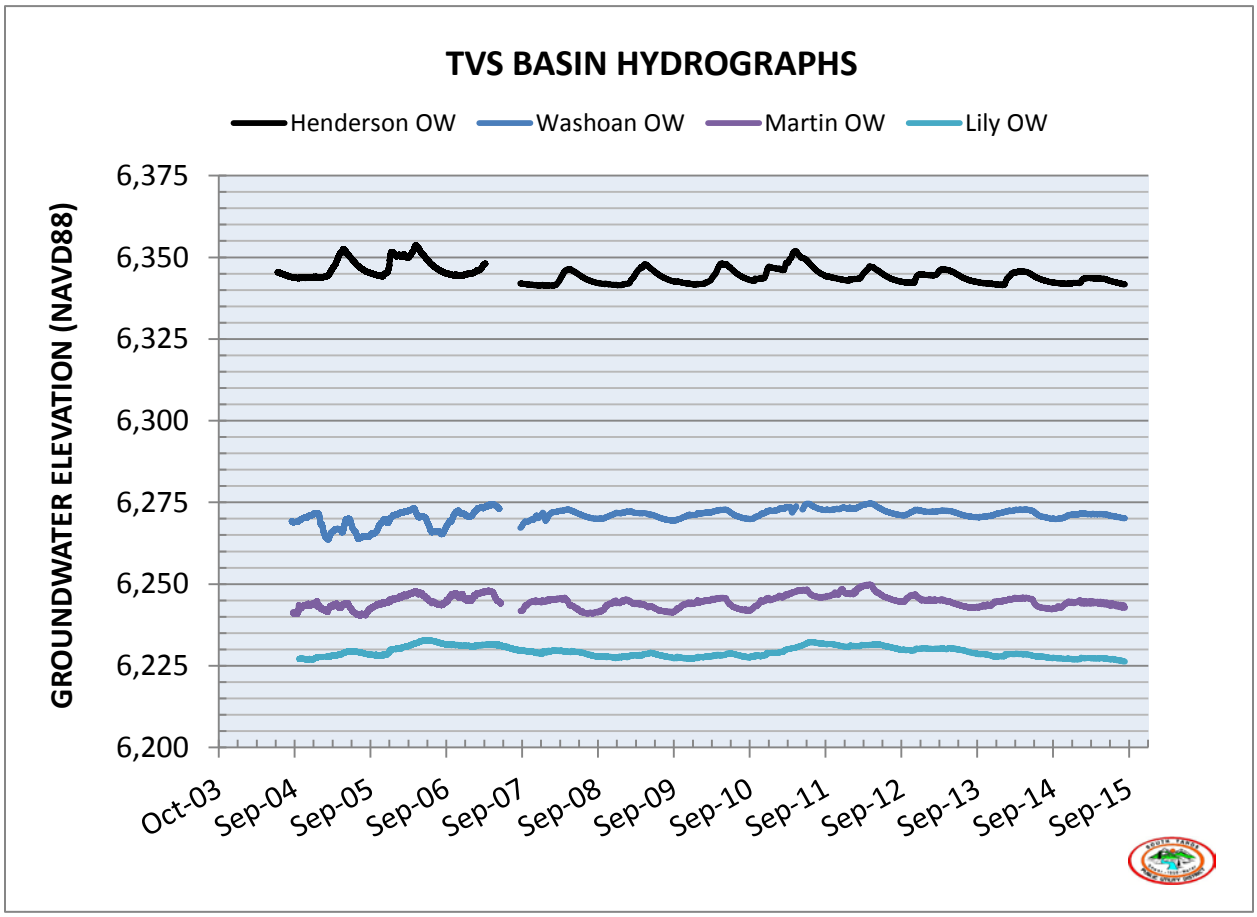

Figure 4. Continuous dedicated groundwater elevation readings for four observation wells distributed throughout the TVS Basin. The Henderson Observation Well (OW) is located near the south end of the

TVS Basin within Christmas Valley. The Lily OW is located along the north margin of the TVS Basin, near the south shore of Lake Tahoe.

Figure 4 shows regular fluctuations representing seasonal changes in groundwater elevations. Groundwater elevations tend to rise during the winter storm season when precipitation exceeds evaporation and plant transpiration (evapotranspiration); and groundwater production is at or near seasonal low water demands. Seasonal high groundwater occurring between early-April through mid-June and tend to decline during the summer and into the fall, when evapotranspiration exceeds precipitation and groundwater production is at or near seasonal high water demands., resulting in seasonal low groundwater elevations occurring between mid-July through mid-November. Over the period of record, the continuous readings show that groundwater elevations have been relatively stable. Relatively minor declines in groundwater elevation are occurring during the current 2012-2015 drought. Using the difference in groundwater elevations measured in May 2011 and May 2015 from each of the wells used for groundwater elevation monitoring, the difference in groundwater elevations averaged -4.24 feet for all the wells over this four year period. Using this average, it is estimated that the rate of groundwater elevation decline averaged about -1.1 feet per water year during the 2012-2015 drought.

Hand readings collected during the May 2015 groundwater elevation monitoring event were evaluated to determine whether current groundwater levels are statistically normal, above normal, or below normal for twenty-seven wells distributed throughout the TVS Basin. For each well, the percentile rank of the May 2015 groundwater elevation was determined using the pre-current drought record of hand readings (2001 – 2011) collected for that well. The percentile rank of the May 2015 groundwater elevation for each well was then plotted on a cumulative frequency diagram to show the current state of groundwater level for the TVS Basin compared to the 2001 -2011 period (Figure 5).

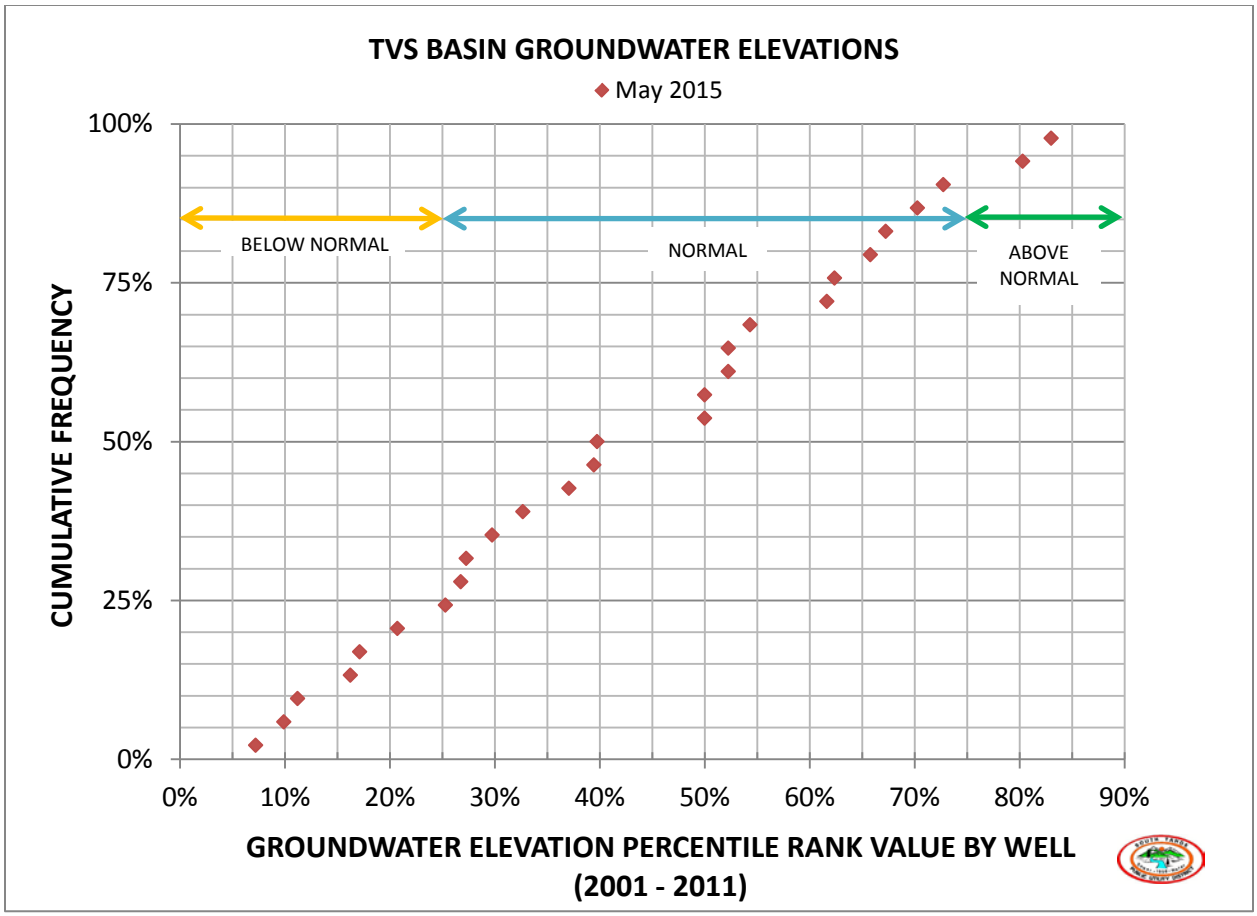

Figure 5. May 2015 groundwater level elevation percentile rank values showing the current status of groundwater levels in the TVS Basin compared to the 2001-2011 record of hand readings.

Figure 5 shows that May 2015 groundwater elevations in 19 of the 27 wells evaluated had groundwater levels within the normal range; six wells were below normal; and two wells had above normal groundwater elevations.

Groundwater areas are geographically-based regions of the TVS Basin that are used to assist in the informal designation of water-bearing zones recognized within the TVS Basin (see Section 5.2.1 of the GWMP). Below normal groundwater elevations were observed in four observation wells (CL-3, Tata Lane #3, SW-1 and Seneca TW) and in two active public water supply wells (Sunset and Bayview). Observation wells CL-3 and Tate Lane #3 are both located near the South "Y" Area, in the southwest corner of the South Lake Tahoe Groundwater Area. The nearest active large-capacity public water supply well (pumping more than 1 million gallons per day) is located more than 1 mile northwest of these observation wells. Therefore, the below normal groundwater elevations in these wells are attributed to the reduction in precipitation and groundwater recharge through this area during the 2012-2015 drought event. Observation Well SW-1 is a relatively shallow observation well located near the south end of the Meyers Groundwater Area constructed to a total depth of 40 feet. The below normal groundwater elevations in this well reflect the elevation decline in the uppermost portion of the water table through this area. The Seneca TW is located immediately west of the Angora Groundwater Area,

outside the west boundary of the TVS Basin and is constructed to a total depth of 180 feet. The below normal groundwater elevations in this well may reflect the reduced levels of groundwater recharge into the TVS Basin. The below normal levels in the public water supply wells are attributed to the reduced precipitation and recharge during the current 2012-2015 drought event and pumping from large-capacity public water supply wells concentrated in the northern portion of the South Lake Tahoe Groundwater Area.

Above normal groundwater elevations were observed in two observation wells (USGS TCF-3 and Glenwood #3). The above normal levels in these observation wells is attributed to the reduced production from an active public water supply well (Glenwood #5) to support sustainable groundwater elevation levels in the Bijou Groundwater Area.

2.3 Groundwater Quality

Groundwater in the TVS Basin is generally of excellent chemical quality, suitable for the designated beneficial uses of municipal, industrial, and agricultural water use and for any other uses to which it might be put. Arsenic is the only naturally occurring constituent that has been found in both public water system wells and private wells at concentrations exceeding primary or secondary drinking water standards. Well head treatment is presently used to remove arsenic from groundwater produced at one active public water supply well (Arrowhead Well No. 3) in the TVS Basin.

Man-made contaminants which occur most frequently in the TVS Basin include petroleum hydrocarbon and chlorinated hydrocarbon compounds. Of these, the two most prominent constituents of concern are Methyl-tertiary Butyl Ether (MtBE) and Tetrachloroethylene (PCE).

During the 2015 WY, trace levels of MtBE were detected in three public water supply wells (Bakersfield, Clement and Paloma Wells) at concentrations below primary or secondary drinking water standards. The presence of MtBE in these wells is believed to be from remaining areas of degraded water quality following the cessation of clean-up activities at closed Leaking Underground Storage Tank (LUST) sites in the Meyers and South Lake Tahoe Groundwater Areas.

PCE continued to impair water quality in groundwater sources located in the South “Y” area. In July 2014, levels of PCE exceeding drinking water standards were detected in two public water supply wells (LBWC#2 and LBWC#5) used by Lukins Brothers Water Company (LBWC). Both wells were subsequently removed from service and are presently inactive. PCE is also detected at levels exceeding drinking water standards in one public water supply well (TKWC #2) used by the Tahoe Keys Water Company (TKWC). In 2008, TKWC installed a wellhead treatment system for the removal of PCE from groundwater from this well; limiting water production to about 30% of its nominal capacity. Trace levels of PCE were detected in one public water supply well (Clement Well) used by the District, at concentrations below drinking water standards. This well is currently inactive.

In September 2015, the Lahontan Regional Water Quality Control Board (LRWQCB) issued a proposed Clean Up and Abatement Order (CAO No. R6T-2015-PROP) to clean up and abate the discharge and threatened discharge of chlorinated hydrocarbons at 1024 Lake Tahoe Blvd, South Lake Tahoe, Eldorado

County, CA. Through its groundwater management efforts as the Groundwater Sustainability Agency (GSA) for the TVS Basin, District staff has met with representatives from LRWQCB, LBWC and TKWC regarding this matter.

Due to the continued impairment of groundwater sources throughout the South Y Area, the District, in collaboration with the SAG, developed a scope of work to conduct a well assessment and data collection effort that could be used as a basis of design for future extraction wells in order to contain the migration of PCE in groundwater through this area (see Section 3.3). In November 2015, this scope of work was issued as a Request for Proposal (RFP) for engineering firms to perform this work.

2.4 Pumping Volumes

Groundwater serves as the primary source of drinking water supply throughout the TVS Basin. More than 90 percent of groundwater extractions from within the TVS Basin are from public water supply wells operated by the District, the TKWC and LBWC. The monthly and total pumping volumes of groundwater extracted by these wells during the 2015 water year are summarized below in Table 3. During the 2015 WY, a total of sixteen (16) public water supply wells were active within the TVS Basin.

PUBLIC WATER SYSTEM	UNITS	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JLY	AUG	SEPT	2015 WY
South Tahoe Public Utility District (STPUD)	AF	436	299	358	396	303	304	312	396	555	635	668	579	5,241
Tahoe Keys Water Company (TKWC)	AF	84	15	16	17	14	29	31	78	103	130	136	129	782
Lukins Brothers Water Company (LBWC)	AF	19	17	10	8	11	14	17	20	39	40	42	36	274
TVS BASIN PWS TOTALS		540	331	383	422	328	347	361	494	696	805	846	744	6,298

Table 3. Monthly pumping volumes for public water system wells in the TVS Basin during the 2015 water year, reported in acre-feet (AF).

The groundwater production (in AF) for each of the TVS Basin public water systems listed above is shown below in Figure 6. Since the 2005 WY, the annual groundwater extractions from the pumping of these public water system wells has ranged from about 6,298 AF in 2015 to about 9,652 AF in 2007, with a median value of about 7,775 AF. The 2015 WY was the historically lowest groundwater production year for the District's water system (1988 -2015), which accounts for about 84% of the total groundwater pumped by these wells. During the 2015 WY, the total groundwater production from these wells (PWS WELLS- TOTAL) was about 20% below the median value.

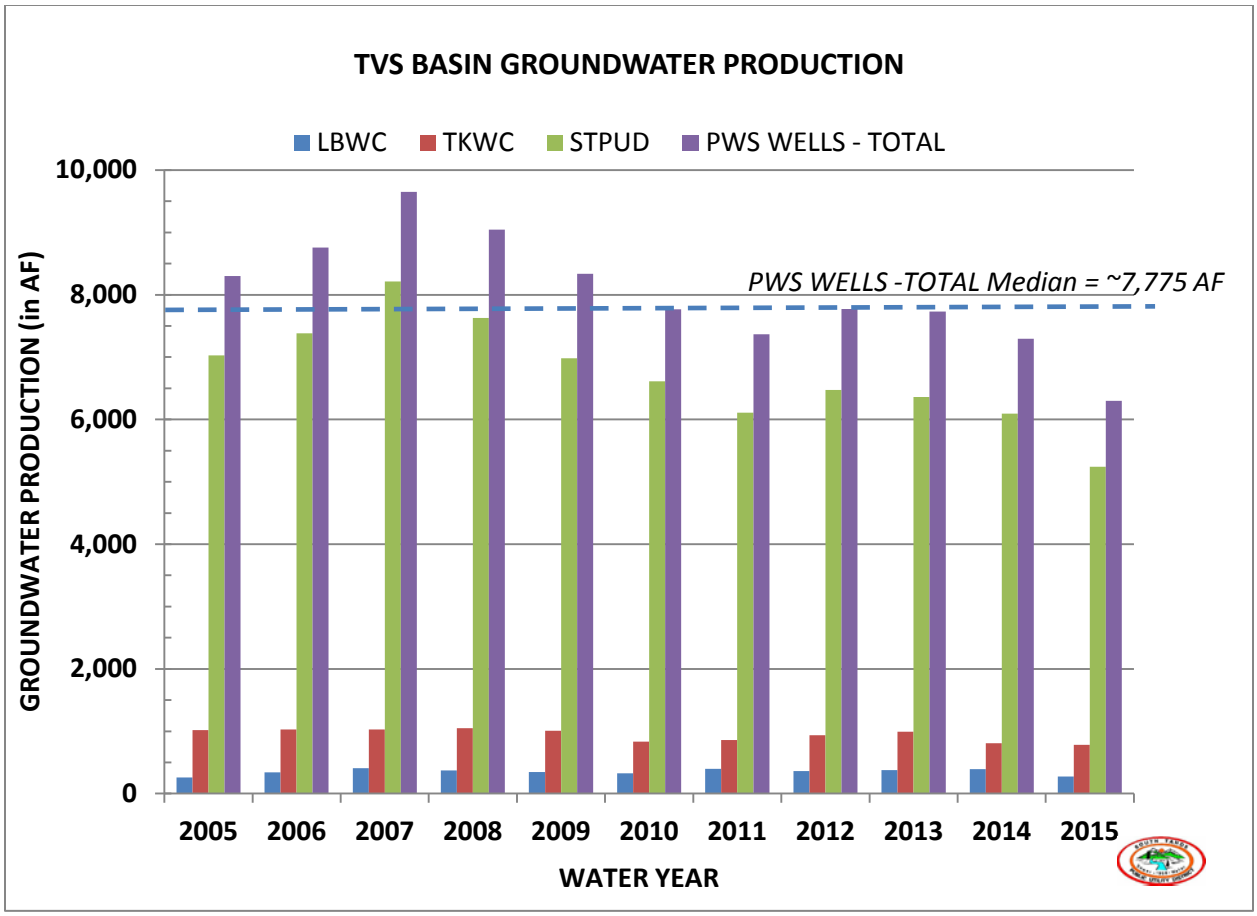

Figure 6. Groundwater production trends for public water system wells in the TVS Basin, since the 2005 WY, in acre-feet (AF).

2.5 Groundwater Storage

Total groundwater storage for the TVS Basin has been estimated using two differing approaches: 1) using reservoir mapping of the aquifer's water-bearing zones derived from geologic logs and storage coefficient information from aquifer tests; and 2) using water budgets simulated from the Groundwater Surface water Flow Model (GSFLOW) presently being developed by the Desert Research Institute, Nevada System of Higher Education, (DRI) (see Section 3.2). Preliminary estimates of groundwater storage in the TVS Basin from these efforts are provided below in Table 4. It is important to note that much of the groundwater storage as calculated by the groundwater model may not be accessible. This would include upland areas along riparian corridors and deeper portions of the aquifer due to economic constraints. Accessible groundwater in storage could be a much as 50 percent less than the value reported in Table 4 (~1,200,000 acre-feet).

METHOD	AREA (Acres)	SATURATED THICKNESS (Feet)	STORATIVITY (Sy, Ss)	GROUNDWATER in STORAGE (Acre-Feet)
STPUD				
Kriging	21,894	83	0.078	141,742
Minimum Curvature	12,434	202	0.078	195,910
DRI				
Groundwater Model[1]	50,300	590	0.3	2,400,000

Table 4. Preliminary estimates of groundwater in storage within the TVS Basin from reservoir mapping and simulated water budgets from coupled groundwater and surface water modeling.
[1]Total groundwater in storage calculated from all "alluvial" model cells in the top three model layers (590 ft) including those along riparian corridor in upland areas.

From groundwater elevation monitoring readings collected within the TVS Basin (Section 2.2); groundwater levels have declined on average about -4.2 feet since May 2011 and about -1.5 feet since May 2014. Using the reservoir areas and storage coefficients from the District estimates the associated change in groundwater storage during the current 2012-2015 drought event is estimated at about 4,000 to 7,100 AF; and about 1,455 to 2,560 AF since the 2014 WY.

Annual groundwater storage versus time is shown in Figure 7 as calculated by the groundwater flow model. Groundwater storage declines by as much as 35,000 acre-feet per year (AF/yr) in drought years, but is replenished by as much as 40,000 AF/yr in wet years. Average change in groundwater storage over the simulation period (1983-2014) is positive at approximately 2,100 AF/yr, with groundwater levels declining slightly to balance the water budget. During the 2012-2014 drought period groundwater storage decreased by 10,000 – 20,000 AF/yr. Using the reservoir areas and groundwater storage changes from the groundwater model, the average decline in groundwater levels during the 2012-2014 water year are estimated at approximately -0.66 feet per year to -1.33 feet per year.

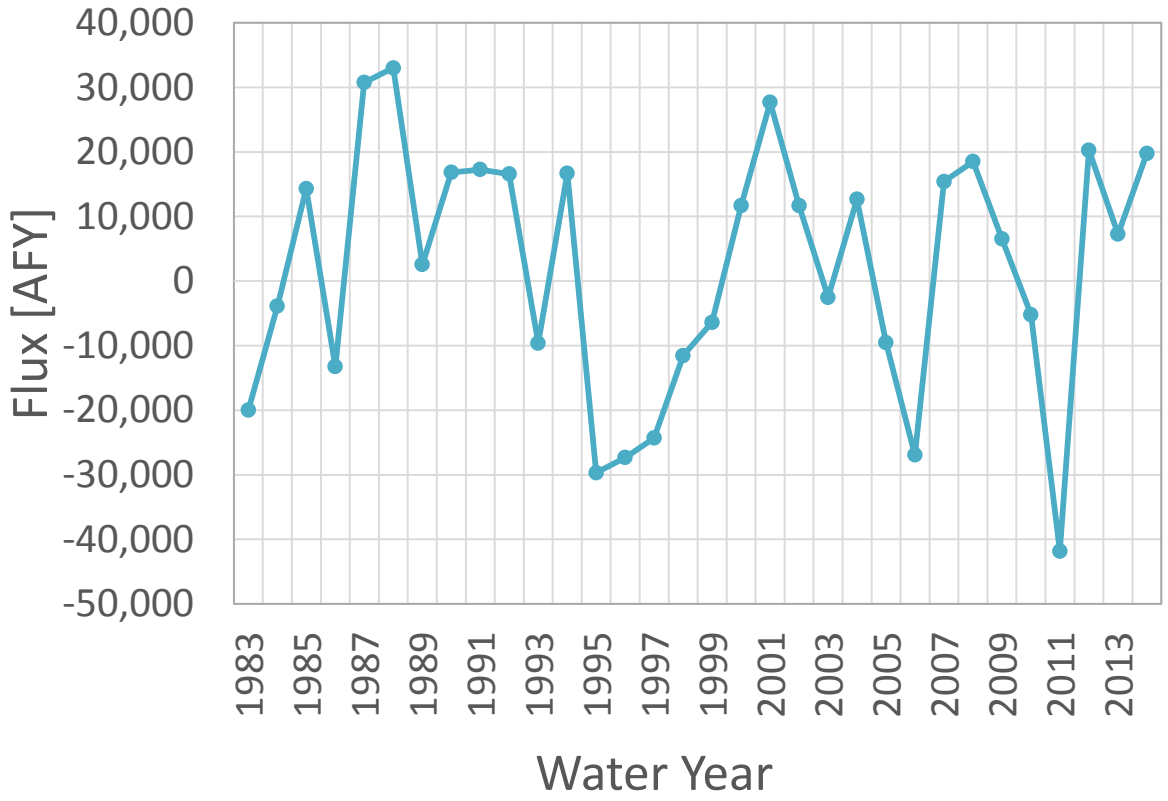

Figure 7. Change in groundwater storage as calculated from the TVS groundwater model. From the groundwater model, positive values of change in groundwater storage correspond to declining groundwater levels; negative values correspond to rising groundwater levels.

3 Groundwater Management

Groundwater management activities listed below generally include items required for on-going compliance with SGMA and project initiation to address actions under the TVS Basin 2014 Groundwater Water Management Plan (GWMP);

1. Establishment of the District as the GSA for the TVS Basin;
2. Initiated development of groundwater models and hydrologic modeling tools to support implementation of the following Basin Management Objectives (BMOs);
    a. BMO #4, Action 2: Conduct a regional groundwater vulnerability assessment;
    b. BMO #5, Action 1: Assess the effects of groundwater pumping on habitats in lakes, streams and wetlands;
    c. BMO #5, Action 3: Assess potential effects of climate change on groundwater conditions;
    d. BMO #7, Action 3: Update the existing TVS Basin Groundwater model; and,

   e. BMO #7, Action 4: Expand monitoring well network to evaluate groundwater recharge and other key areas.
3. Initiated an investigation for the removal of PCE from groundwater in the South "Y" area in support of BMO #2: Maintain and Protect Groundwater Quality; and
4. Enhanced water conservation measures under the SWRCB Emergency Conservation Regulation for BMO #1: Maintain a Sustainable Long-Term Groundwater Supply.

In addition to these activities, the District convened the following public hearings and/or workshops to inform the interested public and agencies of the groundwater management activities being performed in the TVS Basin.

1. April 16, 2015: South Tahoe Public Utility District Board Meeting; Sustainable Groundwater Management Act of 2014 and the Tahoe Valley South Basin (6-5.01);
2. April 22, 2015: Stakeholders Advisory Group Workshop No. 1;
3. July 16, 2015; South Tahoe Public Utility District Board Meeting; Groundwater Sustainability Agency for the Tahoe Valley South Groundwater Basin (6-5.01);
4. August 12, 2015; El Dorado County Water Agency Meeting; Hydrologic Modeling Tools for South Tahoe Public Utility District;
5. December 2, 2015: Stakeholders Advisory Group Workshop No. 2.

On July 16, 2015, the District Board adopted Resolution 2986-15 electing that the District would serve as the GSA for the TVS Basin. Acting on this resolution, District staff submitted a complete GSA formation notification (as required under Water Code Section 10723.8) to the California Department of Water Resources (DWR). Upon receipt of this notification, DWR posted the District's notification on its website for public comment. During the 90-day public comment period (August 19 - November 17, 2015), no other agencies submitted a competing GSA formation notification and no letters of protest were received. As no other competing notice was received, the District is presumed to be the exclusive GSA within the area of the basin it manages.

The boundaries of the TVS Basin include two fringe areas that lie outside the District's LAFCO Boundaries. Staff is working with District Legal Counsel to explore appropriate means by which these fringe areas could be sustainably managed under a single groundwater management plan for the TVS Basin.

3.1 Groundwater Model Update

On August 6, 2015, the District Board authorized staff to enter into a consulting agreement with the DRI, for the initial phase of development of groundwater models and hydrologic modeling tools for implementation of the GWMP. The initial phase of development (Phase 1) generally involves acquiring the data to update the District's existing groundwater flow model and DRI's existing integrated hydrologic model for the South Tahoe watersheds; constructing and calibrating a steady-state groundwater flow model for the TVS Basin; constructing and calibrating a transient integrated

hydrologic model for the South Tahoe watersheds; and development of a comprehensive steady-state water budget for the TVS Basin.

Completion of Phase 1 is anticipated by the end of January 2016.

Updating and integration of the computer models under Phase 1 will be used for complex analysis of the TVS Basin hydrologic system under Phase 2. Modeling work for Phase 2 is anticipated to begin during the first quarter of 2016.

3.2 South Y Investigation

Section 10 of the GWMP provides an Implementation Plan to assist with the application and assessment of the GWMP. The Implementation Plan organizes actions into several categories depending on whether these actions are on-going; planned to be implemented over the next five years; or planned to extend beyond the next five year planning period. The Short-Term Implementation Plan includes actions that the District plans to implement over the next five years. As part of the Short-Term Implementation Plan to maintain and protect groundwater quality (BMO # 2), the SAG recommended that the District support renewed investigation and clean-up of groundwater contamination with special emphasis on PCE contaminant plume(s). In response to this concern, the District developed and solicited a Request for Proposals (RFP) to groundwater consultants in order to evaluate the suitability of using the LBWC #4 Well for the removal of PCE from groundwater in the South "Y" Area. Primary objectives for this project include; vertical profiling of the well for contaminant flow path delineation; aquifer parameter determination for extraction well capture zone analysis; and influent water quality and contaminant load characterization for future groundwater treatment design.

This project is expected to start in January 2016 and to be completed by June 2016.

3.3 2015 Water Conservation Measures

During May 2015, the SWRCB amended and readopted its Emergency Conservation Regulation, mandating state-wide water conservation measures for all urban water suppliers. In order to reach proscribed water conservation targets, each public water system implemented enhanced water conservation measures to reduce potable water usage from June 2015 through February 2016, as compared for the same months in 2013.

Enhanced water conservation measures enforced by public water systems in the TVS Basin included, but were not limited to;

- Designated outdoor irrigation days;
- Restricted outdoor irrigation times (6:00 am to 6:00 pm);
- Prohibited use of potable water for irrigation of undeveloped properties;
- Prohibited use of potable water for irrigation within 48 hours of a measurable rain event;
- Prohibited use of potable water for irrigation of public street medians;
- Limited serving of drinking water in eating and drinking establishments; and

- Promotion of reduced guest laundering in hotels and motels.

Differences in groundwater production between the 2013 WY and 2015 WY for the major public water systems operating within the TVS Basin are provided below in Table 5. Reviews of Table 5 shows reductions in water use were generally higher during June/July and lower during August/September. Each of the public water systems were able to achieve total water reductions above 20%, compared to 2013 WY usage.

PUBLIC WATER SYSTEM	UNITS	OCT	NOV	DEC	JAN	FEB	JUN	JLY	AUG	SEPT	2015 WY
[1]South Tahoe Public Utility District (District)	Mg/ % Change)	--	--	--	--	--	59/25%	78/27%	55/20%	35/16%	227/22%
Tahoe Keys Water Company (TKWC)	Mg/ % Change)	--	--	--	--	--	17/34%	16/28%	10/18%	5/10%	47/23%
[1]Lukins Brothers Water Company (LBWC)	Mg/ % Change)	--	--	--	--	--	2/13%	6/32%	3/17%	2/17%	13/21%
TVS BASIN PWS TOTALS		--	--	--	--	--	78/26%	100/28%	67/20%	42/15%	287/22%

Table 5. Changes in water usage in the TVS Basin (in millions of gallons (Mg)) during the 2015 WY compared to the 2013 WY. State mandated conservation measures on urban water usage were implemented starting in June 2015.

[1]Change in usage values are not adjusted for 1.16 million gallons of drinking water produced by the District and provided to LBWC through a water system inter-tie.

3.4 Proposed Management Actions (2016 WY)

Groundwater management activities for the 2016 WY will generally involve progressing and, where possible, completing items initiated during the 2015 WY. A general summary of these proposed management actions are listed below;

1. Continue to monitor new regulations issued by the DWR and SWRCB for implementation of the SGMA, with special emphasis on GSA Formation and requirements for Groundwater Sustainability Plans (GSP) and GSP alternatives;
2. Continue to communicate with and solicit feedback from the SAG. Expand communications to small community water systems, domestic well owners and local conservation organizations;
3. Identify an appropriate manner by which fringe areas can be adequately managed under a single GWMP;
4. Complete the South Y Extraction Well Suitability Investigation;

5. Support the development of Prop 1 Funding applications to remove PCE from groundwater through the South Y Area;
6. Continue to develop groundwater models and develop hydrologic modeling tools for implementation of the GWMP and development of a GSP or GSP alternative;
7. Consider local planning agency changes to artificial turf regulations to reduce outdoor irrigation use;
8. Continue enhanced water conservation measures as required under the SWRCB Emergency Conservation Regulation; and
9. Continue monitoring hydrologic conditions within the TVS Basin.

3.5 GWMP Changes

In 2014, the GWMP was last updated to be fully compliant with DWR requirements (AB3030 Plan; California Water Code Section 10750 et seq.) and to better reflect the groundwater concerns of the greater South Lake Tahoe community. As indicated previously in Section 3.0, activities during the 2015 WY focused on items needed to satisfy compliance with new SGMA requirements and initiating projects to address actions identified in the updated GWMP. There were no plan component changes, including addition or modification of BMOs, during the period covered by this report.

3.6 Coordination Efforts

The GWMP includes a number of BMOs that require coordination with other water management, land use and government agencies. During the 2015 WY coordination efforts focused primarily on strengthening collaborative relationships among SAG members, including local water purveyors, governmental agencies and the public. These efforts included;

1. Conducting regular public outreach activities (see Section 3.0);
2. Continued communication and coordination with LBWC, TKWC and LRWQCB concerning PCE groundwater contamination in the South Y Area;
3. Attendance at the Tahoe-Sierra Integrated Regional Water Management (IRWM) meeting (April 15, 2015);
4. Review of No Further Action Requests for groundwater cleanup activities within the TVS Basin;
    - Meyers Landfill T1000000216 (LRWQCB Case No. T6S006)
5. Expanding communication with the Tahoe Regional Planning Agency concerning development of artificial turf regulations; and
6. On-going collaboration with the SAG and hosting of two SAG Workshops as a forum for discussion of local groundwater concerns with stakeholders and interested parties.