



Truckee Donner Public Utility District

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June 21, 2016

To: CA State Water Resources Control Board

RE: Water Supply Reliability Certification and Data Submission

Supporting Analysis and Calculations:

The Truckee Donner Public Utility District (TDPUD) provides potable water exclusively from groundwater sources. The following analysis was conducted in determining the minimum conservation standards for the TDPUD service area:

1. The TDPUD Calculated Annual Potable Water Demand in Acre-feet (2013-2014) is **4736.5 AF** (*SWRCB Certification Submittal Form*). This data is based upon monthly water production metered at the discharge point of each of the TDPUD groundwater wells (*TDPUD Water Production Reports included*).
2. The TDPUD groundwater annual pumping capacity, utilizing current groundwater well infrastructure, is approximately **15,171 AF**.
3. Based on measurements of historical water table depths in the local Martis Valley Groundwater Basin, changes in water table depth have been consistent with seasonal demands and exhibited relatively minor changes over the course of the three dry years 2013-2016 (*Worksheet#2 Groundwater, and TDPUD Groundwater Levels*).
4. Nimbus Engineers, 2001 estimates the Martis Valley Groundwater Basin(MVGB) storage capacity to be **484,000 AF**, with an annual average recharge of approximately 29,000 AF and an available average annual groundwater supply budget of approximately 24,000 AF (*DWR-California's Groundwater Bulletin 118, and TDPUD 2105 UWMP, section 6-2*).
<http://www.water.ca.gov/groundwater/bulletin118/basindescriptions/6-67.pdf>
<http://www.tdpud.org/home/showdocument?id=1567>
5. Current TDPUD well infrastructure design, historical water table depths, and Martis Valley Groundwater Basin estimated storage capacities would allow for up to 700' of additional draw down before substantially affecting the TDPUD's ability to pump water. For example, the Martis Valley Well (TDPUD's largest annual potable water producer) screened intake reaches a depth of approximately 930' with a water table depth of approximately 105'

Based on the above outlined analysis, the Truckee Donner Public Utility District has determined the calculated average annual demand of 4,736.5 AF to be significantly less than the available supply of

15,171AF. Additionally, based upon the MVBG storage capacity and historical water table depths, the consideration of an additional three (3) years of dry weather (2017-2019), as prescribed in the “Stress-Test” would not have a substantial impact on the TDPUD available water supply, nor place the service area in a water shortage condition. The calculated minimum conservation standard for the TDPUD is <0.00%.

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Truckee Donner Public Utility District "Self Certification" Water Conservation Data

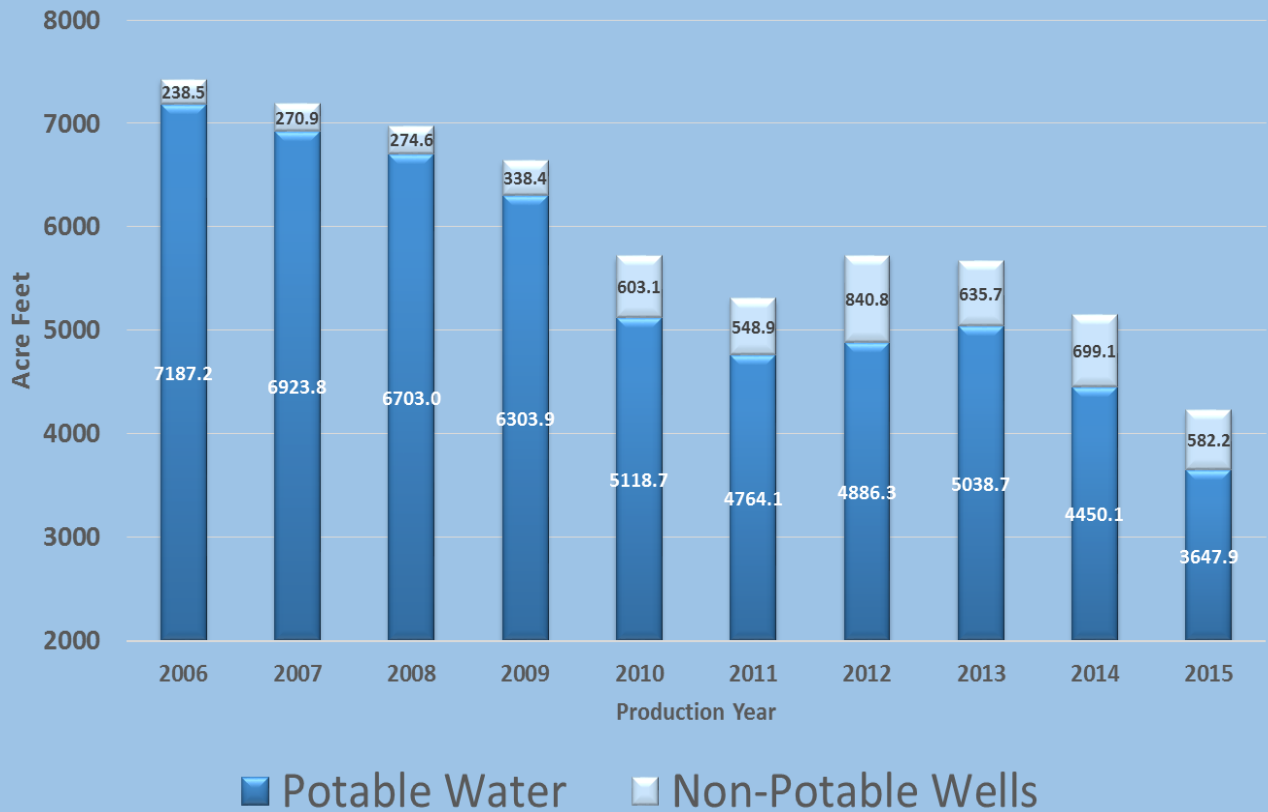
Truckee Donner Public Utility District Groundwater Levels											
	Martis Valley Well	Airport Well	Prosser Village Well	Old Greenwood Well	Glenshire Drive Well	Prosser Heights Well	Prosser Annex Well	Sanders Well	Northside Well	Well 20	A Well
Water Table Level 2016	104.0	197.9	134.6	260.3	37.6	263.5	463.5	N/A*	N/A*	332.2	149.0
Water Table Level 2013	105.5	201.5	133.0	278.2	32.1	265.5	462.0	N/A*	N/A*	365.2	154.0
Well Intake Depth	930'	1027'	1,110'	1,360'	900'	405'	860'	600'	925'	680'	300'
NOTES: All groundwater depth measurements are in feet from well head surface											
N/A* indicates well depth data not available due to technical difficulties in collecting measurements such as obstruction or											

Truckee Donner Public Utility District 2013 Monthly Well Production (Gallons)													
Monthly production totals	Jan	Feb	March	April	May	June	July	August	September	October	November	December	2013
													Total
1. Airport Well	68,315,000	61,238,000	68,792,000	52,738,000	48,275,000	43,956,000	48,768,000	38,960,000	30,848,000	9,118,000	1,973,000	3,109,000	476,090,000
2. Martis Valley Well	0	0	0	23,065,000	63,712,000	61,780,000	66,417,000	64,726,000	61,809,000	57,018,000	56,405,000	59,961,000	514,893,000
3. South Side Well	0	0	0	0	0	0	0	0	0	0	0	0	0
4. Glenshire Dr Well	0	0	0	279,000	4,665,000	9,682,000	22,525,000	17,959,000	11,201,000	1,326,000	0	0	67,637,000
6. Prosser Annex Well	0	0	0	0	6,698,000	8,601,000	10,618,000	9,679,000	7,281,000	3,580,000	0	0	46,457,000
7. Prosser Heights Well	0	0	0	0	3,566,000	4,443,000	6,217,000	5,454,000	4,298,000	1,883,000	0	0	25,861,000
8. Sanders Well	0	0	0	2,231,000	12,949,000	12,267,000	11,772,000	11,656,000	1,947,000	0	0	0	52,822,000
9. Prosser Village Well	17,054,000	10,476,000	8,363,000	14,376,000	25,557,000	25,136,000	32,632,000	31,538,000	29,443,000	22,341,000	6,290,000	9,069,000	232,275,000
10. Northside Well	0	0	0	0	0	4,821,000	6,415,000	5,206,000	0	0	0	0	16,442,000
11. Old Greenwood Well	10,443,000	11,096,000	10,228,000	15,552,000	8,255,000	13,781,000	23,034,000	18,939,000	14,989,000	7,517,000	6,349,000	10,503,000	150,686,000
12. Well 20	0	0	0	0	4,537,224	6,049,254	6,977,997	6,328,205	3,137,810	0	0	0	27,030,490
13. "A" Well	0	0	0	0	2,722,200	8,021,800	7,980,900	7,566,600	2,796,800	0	0	0	29,088,300
Month Totals	95,812,000	82,810,000	87,383,000	108,241,000	180,936,424	198,538,054	243,356,897	218,011,805	167,750,610	102,783,000	71,017,000	82,642,000	1,639,281,790

Truckee Donner Public Utility District 2014 Monthly Well Production (Gallons)

Monthly production totals	Jan	Feb	March	April	May	June	July	August	September	October	November	December	2014
													Total
1. Airport Well	2,484,000	1,602,000	1,490,000	2,404,000	36,520,000	48,643,000	49,803,000	39,523,000	33,046,000	19,377,000	1,557,000	2,526,000	238,975,000
2. Martis Valley Well	59,306,000	52,719,000	57,685,000	58,398,000	61,098,000	64,201,000	64,525,000	61,326,000	57,606,000	54,453,000	52,873,000	56,146,000	700,336,000
3. South Side Well	0	0	0	0	0	0	0	0	0	0	0	0	0
4. Glenshire Dr Well	0	0	0	0	1,636,000	12,919,000	16,841,000	8,143,000	5,624,000	1,933,000	202,000	0	47,298,000
6. Prosser Annex Well	0	0	0	958,000	6,508,000	9,259,000	9,731,000	7,664,000	6,372,000	4,581,000	0	0	45,073,000
7. Prosser Heights Well	0	0	0	717,000	3,217,000	3,873,000	4,448,000	4,224,000	3,576,000	2,507,000	0	0	22,562,000
8. Sanders Well	0	0	0	0	0	7,629,000	11,988,000	11,188,000	10,393,000	21,000	0	0	41,219,000
9. Prosser Village Well	9,712,000	7,266,000	8,882,000	10,906,000	22,274,000	26,358,000	26,293,000	22,956,000	21,239,000	17,074,000	9,030,000	9,479,000	191,469,000
10. Northside Well	0	0	0	0	0	4,680,000	5,873,000	5,035,000	1,447,000	0	0	0	17,035,000
11. Old Greenwood Well	7,895,000	8,215,000	9,252,000	9,812,000	4,698,000	11,720,000	14,484,000	8,124,000	6,329,000	4,438,000	6,256,000	7,966,000	99,189,000
12. Well 20	0	0	0	0	4,212,299	5,860,053	5,831,552	3,943,739	3,764,944	0	0	0	23,612,587
13. "A" Well	0	0	0	0	0	5,833,400	6,923,200	6,689,500	1,683,100	0	0	0	21,129,200
Month Totals	79,397,000	69,802,000	77,309,000	83,195,000	140,163,299	200,975,453	216,740,752	178,816,239	151,080,044	104,384,000	69,918,000	76,117,000	1,447,897,787

TDPUD Annual Water Production



Martis Valley Groundwater Basin

- Groundwater Basin Number: 6-67
- County: Nevada, Placer
- Surface Area: 35,600 acres (57 square miles)

Basin Boundaries and Hydrology

The Martis Valley Groundwater Basin is an intermontane, fault-bounded basin east of the Sierra Nevada crest. The Martis Valley is the principal topographic feature within the Basin, although the Basin extends to the north and west of the well-defined valley. The floor of Martis Valley is terraced with elevations between 5,700 and 5,900 feet above mean sea level. The valley is punctuated by round hills rising 1,000 feet or more around the valley perimeter. Mountains along the southern margin of Martis Valley rise dramatically to elevation in excess of 8,000 feet mean sea level. The basin boundaries are based on detailed field investigations developed by Hydro Search Inc. (1975).

The Truckee River crosses the basin from south to east in a shallow, incised channel. Principal tributaries to the Truckee River are Donner Creek, Martis Creek, and Prosser Creek. Major surface water storage reservoirs include Donner Lake, Martis Creek Lake, and Prosser Creek Reservoir. Average precipitation is estimated to be 23 inches in the lower elevations of the eastern portion of the basin to nearly 40 inches in the western areas.

Hydrogeologic Information

Water Bearing Formations

The following summary of water bearing formations is from Nimbus Engineers (2001).

Basement Rocks. Basement rocks include all rock units older than the basin-fill sediments and interlayered basin-fill volcanic units, specifically Cretaceous-Jurassic plutonic and metamorphic rocks and Miocene volcanic units. The plutonic/metamorphic rocks crop out east of the Basin and may underlie the Basin at depth. The Miocene volcanic units crop out adjacent to the basin and have been encountered in boreholes beneath the basin. The Miocene volcanic rocks have been referred to as the Kate Peak Formation and include lava, tuff breccia, and volcanoclastic deposits ranging from andesite to basalt in chemical composition. These basement rocks form the three dimensional boundaries of the basin. Basement rocks in the Truckee area typically contain, transmit, and yield relatively small quantities of groundwater.

Sedimentary deposits. Basin-fill sedimentary units include all sedimentary sequences deposited within the late Miocene-Pliocene Basin. These depositional sequences include interbedded sediments of stream and lake origin with laterally extensive, relatively impermeable, clay and silt layers materials of glacial origin and recent alluvial material. The basin-fill sedimentary units provide the greatest opportunity for storage and extraction of groundwater.

Last update 1/20/08

Volcanic deposits. Basin-fill volcanic units include basaltic andesite lava, tuff breccia and volcanoclastic deposits ranging in age between 0.75 and 7 million years. Basin-fill volcanic units underlying the Martis Valley and provide primary permeability in the interflow zones and within the interbedded volcanoclastics and secondary permeability from fractures and joints in the flows.

Structural Features. Structural features related to Basin and Range-style, normal faulting resulted in the formation of Martis Valley and the Martis Valley Groundwater Basin. Development of the Basin began in the late Miocene with the inception of faulting although most structural development occurred in the last five million years. Motion on many of these structures has continued to the present day.

Recharge Areas (optional)

Groundwater Level Trends

Water level elevations within the Martis Valley are strongly controlled by the complex stratification of the hydrogeologic units, topographic relief, and groundwater flow barriers. From 1990 through 2000, average basin groundwater levels remained relatively constant. Although, seasonal water level variations can exceed 10 feet.

Groundwater Storage

Groundwater Storage Capacity. In 1975 HSI, estimated the groundwater storage in the basin to be 1,000,000-acre feet. However, a recent study by Nimbus Engineers calculated the volume of the Basin materials to be 9,680,000 acre-feet. This volume was based on a smaller surface area of the deep basin and a greater basin thickness in the northern Martis Valley than used by HSI (1975). HSI used a surface area of the Basin of approximately 37,600 acres with an average depth of 400 feet and a specific yield of 0.07.

Groundwater in Storage. Nimbus Engineers (2001), calculated 484,000 acre-feet of groundwater in storage based on the total basin volume of 9,680,000 acre-feet and an unconfined storativity of 0.05. The value for storativity is a composite of values (Watson 1988) based on the wide variety of geologic materials encountered in the basin.

Groundwater Budget (Type A)

Nimbus developed a groundwater balance for the basin patterned after the work by HSI (1975). The water balance illustrates the relative distribution and movement of groundwater in the Basin and is considered to represent average annual conditions of precipitation and the best estimates of current groundwater inflow and outflow. Estimated inflows include natural recharge at 23,829 acre-feet and artificial recharge at 5,433 acre-feet. Estimated outflows include urban extraction at 7,062 acre-feet. Subsurface inflow and outflow were estimated to be 5,336 and 17,639 acre-feet, respectively. Nimbus Engineers has calculated 24,700 acre-feet per year of groundwater is available in the Martis Valley Groundwater Basin. The estimated average

annual recharge to the Martis Valley Groundwater Basin is 29,165 acre-feet/year (Nimbus Engineers 2001).

Groundwater Quality

Characterization. Water quality in the Truckee River and Martis Creek is considered good to excellent and capable of supporting a variety of beneficial uses. Groundwater quality will be effected by the Tahoe Truckee Sanitation Agency water reclamation plant expansion (CH2MHILL 1999).

Impairments. The Tahoe Truckee Sanitation Agency is expanding their Water Reclamation Plant. The plant is located in the Martis Valley groundwater basin. The draft environmental impact report by CH2MHILL (1999) explains the impacts on groundwater in detail.

Well Production characteristics

Well yields (gal/min)		
Municipal/Irrigation	Range: ? – 1505	Average: 151 (30 Wells, Nimbus Engineers)
Total depths (ft)		
Domestic	Range: 19 - 900	Average: 265 (122 Well Completion Reports)
Municipal/Irrigation	Range: 112 – 905	Average: 401 (17 Well Completion Reports)

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
DWR Glenshire MWC	Groundwater levels	13 wells semi-annually 7 wells monthly
T-TSA	Mineral, nutrient, & minor element.	2 wells
Department of Health Services	as required in Title 22, Calif. Code of Regulations	5 wells

Basin Management

Groundwater management:	Truckee Donner PUD adopted an AB3030 plan in 1995 (Phase 1). PCWA adopted an AB3030 plan for the Placer County portion of Martis Valley in 1998 and then updated this plan in 2003.
Water agencies	
Public	Placer County Water Agency
Private	Truckee Donner PUD , Glenshire MWC , Donner Lake WC , Northstar CSD

Last update 1/20/06

References Cited

- CH2MHILL. 1999. Water Reclamation Plant Expansion Project, Vol I and II.
- Hydro-Search, Inc. 1975. Availability of Ground Water, Truckee Donner Public Utility District, Nevada County, California, Prepared for the Truckee Donner Public Utility District, February 14, 1975.
- Hydro-Search, Inc. 1995. Ground Water Management Plan Phase I Martis Valley Ground - Water Basin No. 6-67 Nevada and Placer counties, California, Prepared for Truckee Donner Public Utility District January 31, 1995
- Nimbus Engineers. 2001. Ground Water Availability in the Martis Valley Ground Water Basin. Nimbus Job No. 0043

Additional References

- Helley, E.J., and D.S. Harwood. 1985. Geologic Map of the Late Cenozoic Deposits of the Sacramento Valley and Northern Sierran Foothills, California. U.S. Geological Survey Miscellaneous Field Studies Map MF-1790.
- Hydro-Search, Inc. (HSD). 1980. Truckee and Vicinity, Ground-water Resource Evaluation, prepared for Dart Resources April 21, 1980
- North Tahoe Public Utility District, Consumer Confidence Report for 1999.
- Thodal, Carl E. 1997. Hydrogeology of Lake Tahoe Basin, California and Nevada, and Results of a Ground-Water Quality Monitoring Network, Water Years 1990-1992. Water-Resources Investigations Report 97-4072. USGS. 53 p.
- U.S. Geological Survey Water-Resource Investigations Report 78-124.

Errata

- Updated groundwater management information and added hotlinks to applicable websites.
(1/20/06)