

Monitoring Report Submittal Transmittal Form

Attn: Harold Hold (916) 464-4676
Central Valley Regional Water Quality Control Board
11020 Sun Center Drive #200
Rancho Cordova, CA 95670-6114

Discharger: Bear Valley Water District
Name of Facility: Bear Valley Wastewater Treatment and Disposal Facility
WDRs Order Number: 5-201-208
County: Alpine County
Regulator Program: Waste Discharge to Land (Non15)
Unit: Compliance
CIWQS Place ID: 209035

The Bear Valley Water District is hereby submitting to the Central Valley Regional Water Quality Control Board the following information:

Check all that apply:

Annual Monitoring Report for the year 2015

1st / 2nd / 3rd / 4th (**circle one**) Quarterly Monitoring Report for the year of _____

1st / 2nd (**circle one**) Semi-annual Monitoring Report for the year _____

Monthly Monitoring Report for the year _____

Violation Notification

During the monitoring period, there were were not (**circle one**) any violations of the WDRs.

1. The violations were:
See attached report
2. The actions to correct the violations were:
See attached report

Certification Statement

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Signature:  _____

Phone: 209-753-2112

Printed Name: Jeff Gouveia
General Manager

Date: January 25, 2016

**BEAR VALLEY WATER DISTRICT
2015 ANNUAL REPORT**

ORDER # 5-01-208



JANUARY 25, 2016

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SECTION 1 - INTRODUCTION AND BACKGROUND

1.1 Introduction

The Bear Valley Water District (District) provides sanitary sewer collection, treatment and disposal for approximately 600 residential and commercial connections in the Alpine County community of Bear Valley. The District's service area is comprised of approximately 3000 acres located primarily north of California State Highway 4. The District serves the developed private, residential and commercial areas of the Bear Valley village as well as developed adjoining federal recreational lands including the United States Forest Service's (USFS) Lake Alpine Resort and campgrounds, special use permitted (SUP) residential cabins and the Bear Valley Mountain downhill ski resort. The District's wastewater treatment and disposal facility (WWTF) is regulated by the Central Valley Regional Water Quality Control Board (Regional Board) under Waste Discharge Requirements (WDRs) Order No. 5-01-208 and Order No. R5-2011-0053.

1.2 2015 Facility Operations - Overview

During the 2015 water year (October 2014 to September 2015), an annual daily average flow of approximately 0.04 million gallons per day (MGD) (approximately 15.96 MG total) was received at the District WWTF. WDRs Order No. 5-01-208 currently limit influent flow to 0.1 MGD (annual average basis).

Preliminary treatment at the District's main pump station (headworks) consists of shredding (comminutor) and grit removal before the influent reaches the primary sedimentation tank where the settleable solids are allowed to fall to the bottom of the tank. Effluent flow is then measured during transfer via three, 10 HP Paco pumps to a 14.18 million gallon (MG) two cell, aerated treatment lagoon for secondary biological nutrient removal. While in the two cell lagoon system, the constituents are largely consumed and/or sequestered. Air is delivered to the secondary treatment lagoon via one 40 HP, VFD-equipped Gardner Denver positive displacement blower to thirty six (36) - 18" diameter, submerged helixor, coarse bubble diffusers. Inline YSI sensors communicate with the VFD blower by way of the SCADA system to keep dissolved oxygen and suspended solids at optimum levels. Treated effluent from the aerated lagoon is then chlorinated during transfer via (2) - 200 GPM Paco pumps through a 12,000 gallon chlorine contact tank. The chlorinated effluent is then placed into storage and receives further treatment in a 76.4 MG effluent polishing reservoir.

During the irrigation season, typically late spring through early autumn, the polished effluent is disposed of through spray irrigation on approximately 80 acres of sprayfields: 40 acres of land which is authorized by Special Use Permit (SUP) from the USFS and 40 acres under private lease through 2048. Both the leased disposal area and the permitted land have been in service since before the installation of the groundwater monitoring wells (approximately 40 years for the leased land) at the site.

Effluent disposal via spray irrigation involves the disbursement of the effluent through low impact, high uniformity, Nelson sprinkler heads upon soils and vegetation within the disposal area. The average monthly application rates during the peak disposal months of 2015 ranged from approximately 0.4 to 0.7 acre feet ((0.128 MG – 0.222 MG) per acre per month. The water is allowed to percolate into the soil and evapotranspire into the atmosphere. WDRs Order No. 5-01-208 limit application of wastewater to reasonable rates considering soil, climate, and irrigation management system. Attached as Appendix A. find the 2015 Land Disposal Maximization Report that provides detail on loadings rates during this irrigation season.

1.3 Regulatory Requirements

Discharge at the Bear Valley Water District WWTF is subject to requirements contained in the two wastewater permits: Order No. 5-01-208 and Order No. R5-2011-0053. These include the Standard Provisions and Reporting Requirements for Waste Discharge Requirements effective 1 March 1991, Revised Monitoring and Reporting Program No. 5-01-2085 effective 1 July 2002, Monitoring and Reporting Program, NPDES, Appendix E. effective September 2011, and the Water Quality Control Plan for the California Regional Water Quality Control Board, Central Valley Region and associated documents (Basin Plan).

The District's WDRs also contain monitoring and reporting requirements, which include tri-annual monitoring of groundwater. The District's Third Tri-Annual 2015 Groundwater Monitoring Report prepared by Stantec Consulting Services is submitted under separate cover. These requirements and policies are discussed below as they relate to discharges to land and groundwater limitations at the WWTF.

SECTION 2 – GROUNDWATER MONITORING

Please see the *Bear Valley Water District Third Tri-Annual 2015 Groundwater Monitoring Report* submitted under separate cover for an evaluation of groundwater quality beneath the wastewater facility as well as a discussion of current groundwater compliance status.

The Monitoring and Reporting Program (MRP) of WDR Order No. 5-01-208 states that the tri-annual reports shall be submitted to the Regional Board by the first day of July (1st Tri-Annual Report), September (2nd Tri-Annual Report), and February (3rd Tri-Annual Report) of each year.

However, these reporting requirements do not take into account the unique climatic factors that control when the District can access and sample their groundwater monitoring wells. Pursuant to email correspondence from Regional Board staff, Regional Board staff will not recommend enforcement to the Executive Officer so long as the 1st and 2nd tri-annual monitoring reports are submitted by September 1st and November 1st of each year, respectively, instead of the dates currently required in the MRP. The third tri-annual report will remain due by February 1st each year.

SECTION 3 - WATER CONSERVATION AND I/I REDUCTION SUMMARY

3.1 Water Conservation Activities

The District's Water Conservation Plan has been fully implemented since its development in 2002. The District is solely a wastewater service provider and does not provide potable water to its service area. Instead, the Lake Alpine Water Company is the water purveyor for 80 to 85 percent of water used in the service area.

Much of the water conservation promotion is currently being undertaken by the Lake Alpine Water Company. Most significantly, Lake Alpine Water Company installed residential water meters for all its customers in 2008 and since this period water delivered to LAWC customers has decreased dramatically. Decreases have resulted not only from decreased consumption based on new usage fees but from the ability of LAWC to identify and quickly remedy water lost through faulty winterizing of vacation homes in the area as well as through pipe breaks due to freezing. For example, water use decreased 15% in 2014 from the previous year and in 2015 meter readings indicate use in the community is down an additional 17% from 2014.

The water conservation efforts undertaken by Lake Alpine Water Company are consistent with the intent of the District's Water Conservation Plan as a means to minimize extraneous flows into the wastewater system. The District does not believe that it is cost effective to duplicate efforts of the Lake Alpine Water Company; however, it has supplemented those efforts as warranted.

In 2015, the Lake Alpine Water Company notified users in the service area of the recent State Water Resources Control Board's Emergency Regulation to Control Water use During Drought. In addition, users were reminded of the water use restrictions required by their covenants, conditions, and restrictions (CC&R), in particular the prohibition on outside irrigation.

It should be noted that water conservation within homes and businesses in the District will continue to reduce the annual volume of water arriving at the WWTF but that wastewater may contain higher concentrations of contaminants, if all other factors in the homes and businesses remain the same. Thus, excessive water conservation measures have the potential to increase the risk for the District of failing to comply with effluent limitations.

3.2 I/I Reduction Activities

The Bear Valley Water District continues to implement Infiltration and Inflow (I/I) reduction activities to reduce wastewater volume. During 2015, these activities included retrofitting ten (10) manholes, including re-grading several manholes, replacing several cones and installing new surface seals.

At the same time, the District has continued annual assessments of the collection system. The assessment consists of video analysis, hydro jetting and flushing of collection lines to identify potential problem areas. In an effort to maximize the I/I reduction program, the District purchased a digital push camera in 2013 to conduct its own collection line video analysis. This investment has enabled the District to increase the frequency of which the entire 83,210 linear feet (15.76 miles) of gravity collection system is assessed on a recurring basis by increasing the length of collection system assessed annually.

During 2015, 9,841 linear feet (12 %) of the collection system was hydro jetted and 6,257 linear feet (7.5%) was investigated using the camera to identify collection system defects, such as root intrusion, cracked pipe, and pipe separations. In 2015, the District's video analysis resulted in the discovery of only one root intrusion defect which was repaired in October 2015.

Additionally, the District replaced approximately 200 linear feet of fiber pipe which was discovered by a local property owner and believed to be a legacy of a former septic system. The fiber pipe, believed to be "Orangeburg" pipe commonly used in the 1950 – 1960's before PVC pipe replaced it, appears to have been serving as many as five homes originally as a group septic system in the residential subdivision. The homes were eventually connected to the sewer system but the fiber collection lines apparently were never replaced until this past summer.

The District also commissioned a demonstration of electricity scanning technology as new studies have found that camera technology may in fact miss as much as 40 – 100% of defect flows. Electro Scan, Inc. performed scans and analyses of three, 72' sections of collection line during a visit on September 24, 2015. The pipes chosen for the scan included original, 8" asbestos concrete pipe, original, 6" PVC pipe and relatively new, 6" PVC pipe. Using Electro Scan's minor, moderate and severe defect approach, the two original collection lines scanned

only revealed minor defects while the new PVC section showed no defects. The demo has provided the District with a viable and potentially improved approach to collection line assessment and is currently working with Electro Scan to estimate the cost of future assessments utilizing this technology.

In addition to these collection system measures, the District has continued efforts to reduce the influx of storm water into the polishing reservoir. Typically, subsurface and surface flow of snowmelt storm water may contribute as much as 60 % to the storage volume of the reservoir. In late 2011, the consulting firm MWH independently evaluated the existing storm water diversion system and made recommendations for improvements. In 2012, the District re-graded the existing diversion ditch in general conformance with MWH's option 3, as found in their December 2011 Memo, "Bear Valley Water District Polishing Reservoir Influx Mitigation Study." Per MWH's Memo, this improvement is estimated to improve the ditches performance to divert storm water flow from the reservoir by 25 percent, which is an approximate reduction of 10 million gallons during a 1- in-100 water year.

SECTION 4 – HYDRAULIC CAPACITY EVALUATION

4.1 Influent Flows

During the 2015 water year (October 2014 to September 2015) the total annual influent flow was approximately 15.9 million gallons (MG), with the highest influent flow months being February and March. The highest daily influent flow was 310,000 gallons per day and occurred on February 9, 2015. WY 2015 total influent flows were approximately 1 MG more than WY 2014 total influent flows of 14.9 MG. WY 2015 influent flows are summarized in Table 1 below.

Table 1 - WY 2015 Influent Flows

Month and Year	Influent Flow (gallons)	Peak Day Flow (gal/day)
October 2014	457,000	23,000
November 2014	476,000	35,000
December 2014	1,160,000	87,000
January 2015	1,551,000	130,000
February 2015	2,866,000	310,000
March 2015	2,045,000	86,000
April 2015	1,480,000	73,000
May 2015	1,625,000	75,000
June 2015	1,134,000	56,000
July 2015	1,381,000	78,000
August 2015	1,093,000	65,000
September 2015	691,000	68,000
Total Water Year	15,959,000	--

4.2 Projected Influent flows

Projected wastewater influent flows for the 2016 water year are anticipated to be higher than the 2015 water year. The last several years have been characterized by extreme drought conditions for the western part of the country. The quantity and duration of the snowmelt period is the controlling factor in determining if available WWTF storage is adequate and if a discharge to surface waters (Bloods Creek) may be necessary.

It is anticipated that the 2016 El Nino will result in average to above average snowfall. A corresponding greater influx of tourism resulting in proportionally increased commercial and residential waste generation is anticipated as well as increased runoff into the polishing reservoir directly and from snowmelt on adjacent land.

4.3 Storage and Disposal Summary

Land discharge at the Bear Valley Water District WWTF is required to be maximized in order to minimize the potential for a surface water discharge to Bloods Creek. The magnitude of the discharge is largely controlled by the amount of precipitation, particularly snowfall, and the timing of the snowmelt period. No discharge to Bloods Creek was necessary during WY2015. Notably, through a combination of water conservation activities, I/I reduction efforts and a concerted effort to maximize land disposal and achieve minimum pool by October 1 each year, the District has yet to exercise its permitted surface water discharge option.

Effluent land disposal began on June 8, 2015 on Fields 1 through 4 (approximately 36.4 acres). This start date is earlier than typically possible for the District due to the low total precipitation and early melt off of the minimal snowpack. Due to the limited amount of effluent stored in the reservoir during this water year (e.g. 18.2 feet of freeboard was available when the polishing pond was at its fullest), irrigation of fields 5, 6, 8, and 9 was not necessary. The average monthly application rates during the peak disposal months of 2015 ranged from approximately 0.4 to 0.7 acre feet (0.128 MG – 0.222 MG) per acre per month.

The disposal season ended on September 24, 2015, when the effluent storage reservoir was essentially empty (e.g., no carryover) and could no longer be feasibly pumped by existing equipment. A summary of irrigation disposal operations during 2015 is presented in Table 3.

Table 2 - 2015 Land Disposal Season Summary

Month and Year	Monthly Disposal Volume (gal)	Maximum Acreage Applied	Storage Volume (Million gallons)
June 2015	4,659,486	36.4	13
July 2015	5,429,313	36.4	6
August 2015	8,105,876	36.4	2
September 2015	5,933,389	36.4	Negligible
Total 2015 Disposal Season	24,128,064	--	

Note that the naturally irregular bottom of the reservoir, coupled with limitations to measuring elevations of effluent occurring in low spots, prevents exact estimates of the small amount of wastewater remaining in storage when the reservoir is nearly empty and cannot be pumped with existing equipment.

However, District staff assessed the storage reservoir minimum pool volume on October 2, 2013, and, with the assistance of the District engineer, determined the minimum pool volume to be approximately 14,000 gallons, significantly less than the estimated volume of 5 MG derived from 1974 Construction Drawings. Accordingly, the volume of wastewater remaining at the end of the disposal season, and at minimum pool, is considered negligible.

As of October 1, 2015 the reservoir was at or below minimum pool with a calculated volume of approximately 14,000 gallons. Approximate reservoir storage volumes on October 1 for the previous 10 years dating back to 2004 are presented in Table 3 below:

Table 3 – Comparison of Reservoir Volumes on October 1 for Previous 10 Years

DATE	VOLUME (MG)
October 2006	2 MG
October 2007	8 MG
October 2008	8 MG
October 2009	8 MG
October 2010	8 MG
October 2011	50 MG
October 2012	Negligible
October 2013	0.014
October 2014	0.014
October 2015	0.014

4.4 Projected Water Balance

The District's storage reservoir was aerial surveyed on September 23, 2013 and several discrepancies were identified between the actual reservoir and the 1974 construction drawings, which previously formulated the basis for the storage reservoir size and capacity.

The 2013 aerial survey and analysis indicates that the reservoir is only 18.6 acres in gross area (not 21.3 acres) and the total storage capacity is 76.4 million gallons (not 106 million gallons). These values suggest that input from I/I into the ponds (directly and from snowmelt on adjacent land) may be less than previously estimated. The District has incorporated the 2013 surveyed storage capacity into their evaluation of maximum wastewater flows, including I/I, which will be contained during a maximum precipitation year with a 1-in-100 year return frequency.

The District Engineer last updated the District's water balance in 2013 following the aerial survey based upon the current NPDES permit, 2011 water year, and September 2013 survey data. Based on the updated water balance, the latest projected capacity of the District has been determined to be 245 single-family equivalent units (EDUs). Attached as Appendix B. find the 2015 updated water balance that provides detail on treatment and disposal calculations for this capacity determination.

SECTION 5 - LAND DISPOSAL AGREEMENTS

Current Land Disposal Agreements are as follows:

1. United States Forest Service (USFS) Special Use Permit (SUP) #1029-01
 - a. 40 acres of Sprayfield - Expired July 1, 2015
 - b. 20 Acres of Buildings and Transmission Lines - Expired July 1, 2015
2. C. Bruce Orvis and TBH Partners - 118 acres - Expires December 7, 2048.
3. C. Bruce Orvis and TBH Partners - Sewer Line Easement - Expires December 7, 2048.
(Applies to outfall facilities outside of long-term lease land)

The USFS and BVWD have been working closely to maintain continued land use within federally permitted limits. Following the June 16, 2011 expiration of the 10-year, 40 additional acre, temporary amendment to SUP #1029-01 ratified in 2001, the USFS and BVWD have been working to better craft the District's remaining 40 acre SUP to better match actual land use. To this end, the USFS performed a site visit in 2012 and, together with District staff, used global positioning (GPS) technology to better identify the District's current land disposal array. This visit yielded a map which now defines the active SUP.

On May 28, 2014, the District provided a copy of communication with a USFS representative reflecting this intent to renew the special use permit in accordance with Order No. R5-2011-0053, Special Provision VI.C.2.c. Subsequently, a meeting was held with the USFS Calaveras District Ranger, Forest Supervisor, and three other USFS representatives on January 9, 2015 to further discuss District use of federal land for effluent spray field application. All indications from the USFS representatives were that the 20 year permit expiring in 2015 would be renewed in the form of a two permits: one, 40 year permit for permanent infrastructure and conveyance systems (collection lines) and one, 10 year permit for effluent spray field application. With respect to the 10 year permit, the USFS recommended the District begin to consider purchasing the land from federal government through the Townsite Act to ensure, long term sustainable control of these areas for sprayfield purposes.

On March 17, 2015, in advance of the July 1, 2015 expiration date, the District submitted Standard Form 299, "Application for Transportation and Utility Systems and Facilities on Federal

Lands” to trigger the SUP reissuance process. As of November 2, 2015, the USFS informed the District that the BVWD permit is on their program of work for this year and that they still need a specialist to conduct and finish the NEPA review prior to permit renewal. The District was told the NEPA review should be completed by the spring/early summer of 2016 and to continue to use the 40 acres of spray fields and 20 acres of buildings and transmission lines while the renewal is in process.

SECTION 6 - SLUDGE/SOLID WASTE DISPOSAL

Sludge at the WWTF accumulates at the bottom of the two cell treatment lagoon as it has since 1972. The sludge depth at the bottom of the treatment pond is measured with a sludge judge annually and has never exceeded six inches (typically one to three inches). The organic solids loading rate on the pond system appears to be so low compared to their natural decay rate that no material accumulation of sludge appears to have occurred over the past 40+ years. At some point in the distant future, the treatment ponds may require sludge to be removed and disposed of at an appropriate landfill.

At the headworks of the WWTF, the most common materials generated generally include grease, sediment, and minor non-organic solid waste. The items not shredded during pretreatment are removed as necessary from the waste stream and disposed of in local, municipal waste transfer stations bound for landfill. Meanwhile, annual organic solids removal at all five (5) District lift stations, totaling approximately 1500 – 2000 gallons, is routinely performed each September or October and was completed this year by El Dorado Septic on October 9, 2015.

Currently the District does not have a formal sludge management plan. However, The District anticipates its renewed NPDES Order may include a provision requiring the District to develop a formal sludge management/disposal plan as a matter of policy. The District is prepared to comply with such a requirement should a sludge management/disposal plan provision be included in the renewed Order.

SECTION 7 - ANNUAL WATER SUPPLY AND POND MONITORING

7.1 Annual Water Supply Monitoring

Annual water supply monitoring was conducted in September and October 2015 in which six (6) samples were taken to include all unique sources of water used by District customers, including three discrete springs, two wells and the surface water treated by the Lake Alpine Water Company sourced from Bear Lake.

The following table presents results for potable water from the BVWD office served by Lake Alpine Water Company (surface water - about 38.5% of influent), Bear Valley Mountain Lodge spring (about 2.2% of influent), the Lake Alpine Lodge well (about 4.8% of influent), the Old Subdivision spring (about 6.9% of influent), Bear Valley Mountain Resort Shop spring, and USFS Lake Alpine Campground well.

Table 4 - Annual Water Supply Monitoring

	LAWC (Surface Water)	Bear Valley Mountain Resort (Spring)	Old Subdivision Home #407 (Spring)	Lake Alpine Resort (Well)	Bear Valley Mountain Resort Shop (Spring)	USFS Lake Alpine Campground (Well)
Sampling Date	10/6/15	10/6/15	10/6/15	9/2/15	10/6/15	9/2/15
% of Influent	38.5	2.2	6.9	4.8	~	~
Boron (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Iron (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Manganese (mg/L)	0.032	<0.020	<0.020	<0.020	<0.020	<0.020
Chloride (mg/L)	7.6	<0.50	1.3	<0.5	<0.50	0.59
Sodium (mg/L)	15	1.8	6.6	2.0	2.9	5.1
T.D.S. (mg/L)	100	65	110	60	95	82
Copper (ug/L)	5.0	97	12	130	28	<2.0
Lead (ug/L)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

7.2 Annual Pond Monitoring

Municipal wastewater contains numerous dissolved inorganic waste constituents which are forms of salinity that may pass through the treatment process and soil profile. Effective control of long term impacts on groundwater quality relies on monitoring and effective source control. As described in Order No. 05-01-205, even in the best of circumstances, long-term land discharge of treated municipal wastewater may potentially degrade groundwater with salt and the individual components of salts (e.g. sodium, chloride).

Order #05-01-208 stipulates annual pond monitoring, including sampling and analysis, of boron, chloride, iron, manganese, and sodium. Certain constituents (e.g. sodium, chloride, boron) are useful indicator parameters for evaluating the extent to which effluent reaches and potentially degrades groundwater. Other constituents (e.g. iron, manganese) are useful indicators to determine whether components of the WWTF with high-strength waste constituents, such as sludge handling facilities, may be ineffective in containing waste.

The following table summarizes the annual pond monitoring results for these constituents sampled on October 6, 2015.

TABLE 5 - Annual Pond Monitoring

CONSTITUENT	STORAGE RESERVOIR	TREATMENT POND
Boron (mg/L)	<0.10	<0.10
Chloride (mg/L)	19	26
Iron (mg/L)	10	0.18
Manganese (mg/L)	0.66	0.058
Sodium (mg/L)	17	28

BEAR VALLEY WATER DISTRICT, 2015 ANNUAL REPORT

Appendix A 2015 Land Disposal Maximization Report
January 13, 2016

APPENDIX A 2015 LAND DISPOSAL MAXIMIZATION REPORT

BEAR VALLEY WATER DISTRICT, 2015 ANNUAL REPORT

Appendix B 2015 Updated Water Balance
January 13, 2016

APPENDIX B 2015 UPDATED WATER BALANCE

**Bear Valley Water District,
2015 Land Disposal
Maximization Report**



October 19, 2015

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1.0 Introduction

The Central Valley Regional Water Quality Control Board's (Regional Board) Waste Discharge Requirements (WDRs) Order No. R5-2011-0053 (NPDES No. CA0085146) Provision VI.C.4.b requires that the Bear Valley Water District (District) submit a Land Disposal Maximization Report by November 1st of each year. This report contains a summary of the efforts undertaken by the District to maximize land disposal, to the degree feasible, during the water year extending from October 2014 through September 2015. Specifically, this report contains the following information:

- An estimate of the amount of carryover wastewater contained in the storage/polishing reservoir beyond October 1st, including the reasons(s) why any carryover was necessary;
- The number of acres utilized for wastewater irrigation during the summer irrigation season;
- The amount of wastewater disposal that occurred utilizing controls and pumps; and,
- A description of the efforts taken during the last year to implement new conservation measures and I/I corrective action measures.

In addition to maximization of land disposal, the District is required to continue implementation of water conservation measures and its infiltration and inflow (I/I) reduction program. Accordingly, this report describes recent measures undertaken by the District to reduce wastewater flows and conserve water. Stantec Consulting Services Inc. (Stantec) has prepared this report on behalf of the District and the data required for completion of this report was provided to Stantec by District staff.

1.1 WATER CONSERVATION

The District's Water Conservation Plan, as required by the Land Disposal Maximization Plan, has been fully implemented since its development in 2002. The District does not provide potable water to its service area, and Lake Alpine Water Company is the water purveyor for 80 to 85 percent of water used in the service area. Much of the water conservation promotion is currently being undertaken by the Lake Alpine Water Company, for their purposes. According to District staff, the water conservation efforts undertaken by Lake Alpine Water Company are consistent with the intent of the District's Water Conservation Plan as a means to minimize extraneous flows into the wastewater system. The District does not believe that it is cost effective to duplicate efforts of the Alpine Water Company; however, it has supplemented those efforts as warranted. Lake Alpine Water Company notified users in the service area of the recent State Water Resources Control Board's Emergency Regulation to Control Water use During Drought. In addition, users were reminded of the water use restrictions required by their covenants, conditions, and restrictions (CC&R), in particular the prohibition of outside irrigation.

1.2 I/I REDUCTION

The Bear Valley Water District continues to implement Infiltration and Inflow (I/I) reduction activities to reduce wastewater volume. According to District staff, during 2015 these activities included retrofitting 10 manholes including new surface seals, and continuation of annual assessments of the collection system. The assessment consisted of video analysis and hydro jetting (flushing) of collection lines to identify potential problem areas. In an effort to maximize the I/I reduction program, the District purchased a digital push camera in 2013 to conduct its own collection line video analysis. This investment has the potential to increase the frequency of which the entire 83,210 feet of collection system gets assessed on a recurring basis, by increasing the length of collection system assessed annually. During 2015, 9,841 linear feet of the collection system was hydro jetted, and 6,257 linear feet was investigated using the camera to identify collection system defects, such as root intrusion, cracked pipe, and pipe separations. In 2015, the District's video analysis resulted in only one defect: a root intrusion scheduled to be repaired by the end of October.

In addition to these collection system measures, the District has continued efforts to reduce the influx of storm water into the Polishing Reservoir. Typically, subsurface and surface flow of snowmelt storm water is a significant contributor to the storage volume of the reservoir. In late 2011, the consulting firm MWH independently evaluated the existing storm water diversion system and made recommendations for improvements. In 2012, the District re-graded the existing diversion ditch in general conformance with MWH's option 3, as found in their December 2011 Memo, "Bear Valley Water District Polishing Reservoir Influx Mitigation Study." Per MWH's Memo, this improvement is estimated to improve the ditches performance to divert storm water flow from the reservoir by 25 percent, which is an approximate reduction of 10 million gallons during a 1 in 100 water year.

1.3 ADDITIONAL MEASURES

The District's storage reservoir was surveyed on September 23, 2013 and several discrepancies were identified between the actual reservoir and the 1974 construction drawings, which previously formulated the basis for the storage reservoir size and capacity. The 2013 aerial survey and analysis indicates that the reservoir is only 18.6 acres in gross area (not 21.3 acres) and the total storage capacity is 76.4 million gallons (not 106 million gallons). These values suggest that inputs from I/I into the ponds (directly and from snowmelt on adjacent land) may be less than previously estimated. The District has incorporated the 2013 surveyed storage capacity into their evaluation of maximum wastewater flows, including I/I, which will be contained during a maximum precipitation year with a 1 in 100 year return frequency. The revised capacity curve from the 2013 survey is used in this report to calculate storage volume, and included as Appendix A for reference.

2.0 2015 Land Disposal

Land discharge at the Bear Valley Water District WWTF is required to be maximized in order to minimize the potential for a surface water discharge to Bloods Creek. The magnitude of the discharge is largely controlled by the amount of precipitation, particularly snowfall, and the timing of the snowmelt period. This section discusses factors contributing to wastewater volume and land disposal operations during 2015.

2.1 PRECIPITATION AND SNOW SUMMARY

Precipitation during water year (WY) 2015 (October 2014 through September 2015) was 33.21 inches in the Bear Valley area. The majority of this precipitation fell between the months of November through May (Table 2-1). Average precipitation in the Bear Valley area is approximately 46 inches per year; therefore, WY 2015 precipitation was a dry year at about 70 % of average.

Table 1 WY 2015 Precipitation

Month and Year	Monthly Precipitation (in. water) ¹	Beginning of Month Snow Water Content (in.) ¹
October 2014	0.55	0
November 2014	5.44	0
December 2014	8.05	0
January 2015	0.21	0
February 2015	8.47	3.5
March 2015	0.88	1.5
April 2015	3.59	0
May 2015	3.38	0
June 2015	1.06	0
July 2015	1.29	0
August 2015	0.02	0
September 2015	0.27	0
Total Water Year	33.21	--

1. Monthly Data from Bloods Creek (BLD) Precipitation Station operated by U.S. Bureau of Reclamation. Data downloaded from CDEC.

The quantity and duration of the snowmelt period is the controlling factor in determining if available WWTF storage is adequate and if a discharge to Bloods Creek is necessary. For WY 2015, the maximum snow depth was 25 inches on December 25, 2014, while the maximum snow water content of WY 2015 was equivalent to 4.4 inches of water on February 10, 2015. The snowmelt occurred gradually during the last half of March, and there was not significant infiltration and inflow into the storage/polishing reservoir during this period. Sufficient storage capacity was available throughout WY 2015 to prevent discharge to Bloods Creek.

2.2 INFLUENT FLOW SUMMARY

WY 2015 influent flows to the Bear Valley Water District are summarized in Table 2. The total annual influent flow was approximately 15.8 million gallons (MG) during WY 2015, with the highest influent flow months being February and March. The highest daily influent flow was 310,000 gallons per day and occurred on February 9, 2015. WY 2015 total influent flows were approximately 1 MG more than WY 2014 total influent flows of 14.9 MG.

Table 2 WY 2015 Influent Flows

Month and Year	Influent Flow (gallons) ¹	Peak Day Flow (gal/day) ¹
October 2014	457,000	23,000
November 2014	476,000	35,000
December 2014	1,160,000	87,000
January 2015	1,551,000	130,000
February 2015	2,866,000	310,000
March 2015	2,045,000	86,000
April 2015	1,480,000	73,000
May 2015	1,625,000	75,000
June 2015	1,134,000	56,000
July 2015	1,381,000	78,000
August 2015	1,093,000	65,000
September 2015	691,000	68,000
Total Water Year	15,959,000	--

1 – Based on District influent flow records.

2.3 STORAGE AND DISPOSAL SUMMARY

The disposal area available to the District is presented in Figure 2-1. Effluent disposal began on June 8, 2015 on Fields 1 through 4. This start date is earlier than typically possible for the District due to the low total precipitation and early melt of the minimal snowpack. Due to the limited amount of effluent stored in the reservoir during this water year (e.g. 18.2 feet of freeboard was available when the polishing pond was at its fullest), irrigation of fields 5, 6, 8, and 9 was not necessary. In fact, by September 24, 2015 the reservoir was essentially empty and could no longer be feasibly pumped by existing equipment.

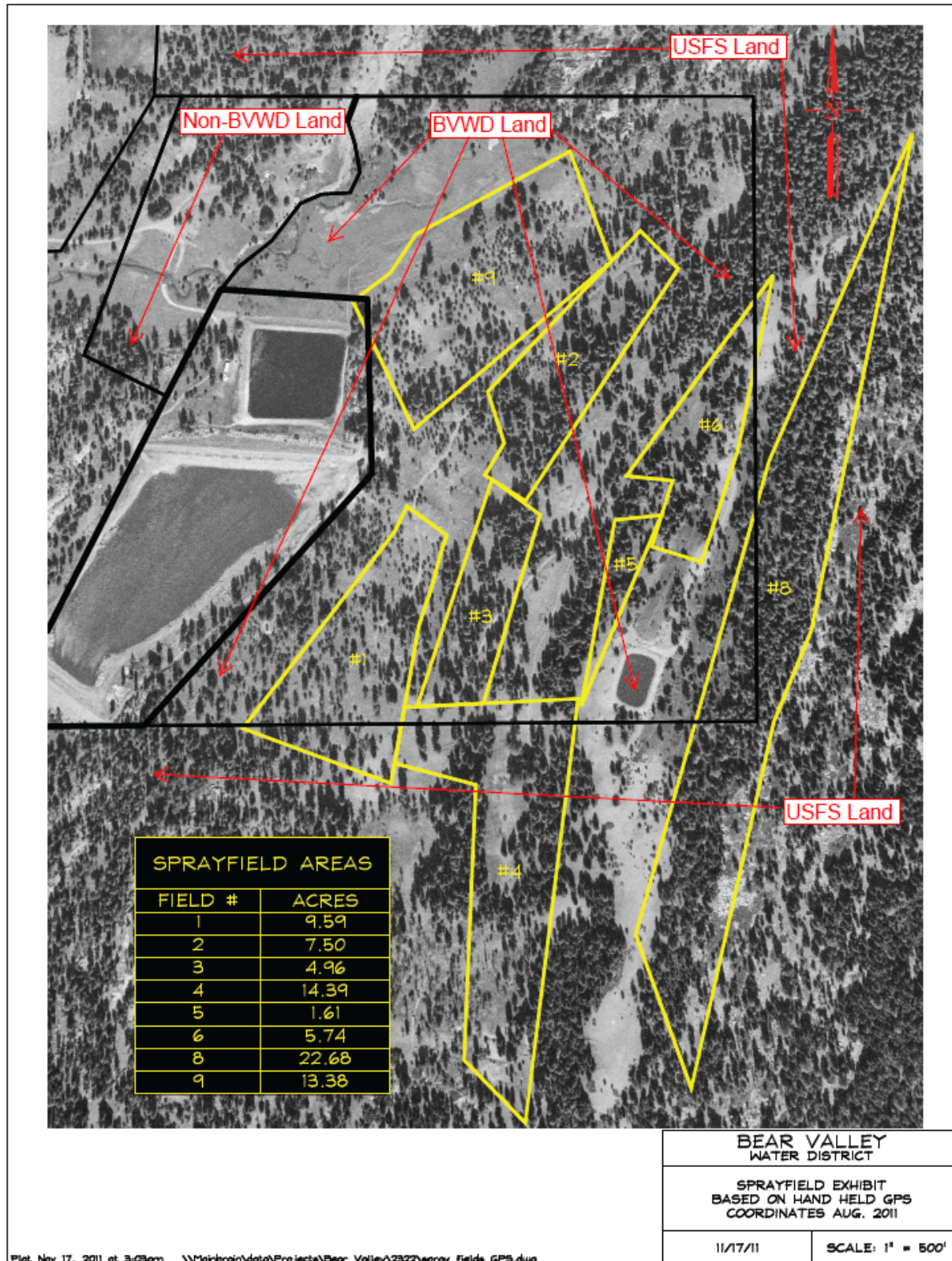


Figure 1 Bear Valley Water District's Irrigation Disposal Fields

The disposal season ended on September 24, 2015, when the effluent storage reservoir was essentially empty (e.g., no carryover). Figure 2 illustrates the reservoir at the end of the 2015 disposal season. A summary of irrigation disposal operations during 2015 is presented in Table 3. Detailed irrigation records are presented in Appendix B for reference.

Table 3 2015 Land Disposal Season Summary

Month and Year	Monthly Disposal Volume (gal)	Maximum Acreage Applied	Storage Volume ³ (Million gallons)
June 2015 ¹	4,659,486	36.4	13
July 2015	5,429,313	36.4	6
August 2015	8,105,876	36.4	2
September 2015 ²	5,933,389	36.4	Negligible ⁴
Total 2015 Disposal Season	24,128,064	--	--

1. Disposal commenced on June 8, 2015.
2. Disposal ceased on September 24, 2015.
3. Wastewater in storage at the end of the month, based on revised capacity curve from 2013 Aerial Survey.
4. Polishing Reservoir was below the minimum pool volume of 0.014 MG.

Note that the naturally irregular bottom of the reservoir, coupled with limitations to measuring elevations of effluent occurring in low spots, (Figure 2) prevents exact estimates of the small amount of wastewater remaining in storage when the reservoir is nearly empty and cannot be pumped with existing equipment. Therefore, the District's reservoir volume rating curve based on pond elevation does not provide accurate measurements when the pond is nearly empty and/or near the minimum pool level. The District had the minimum pool volume surveyed on September 23, 2013, and determined the minimum pool volume to be approximately 14,000 gallons, significantly less than the estimated volume of 5 MG derived from 1974 Construction Drawings. Accordingly, the volume of wastewater remaining at the end of September, and at minimum pool, is considered negligible.



Figure 2 Polishing Reservoir at the End of the 2015 Irrigation Disposal Season

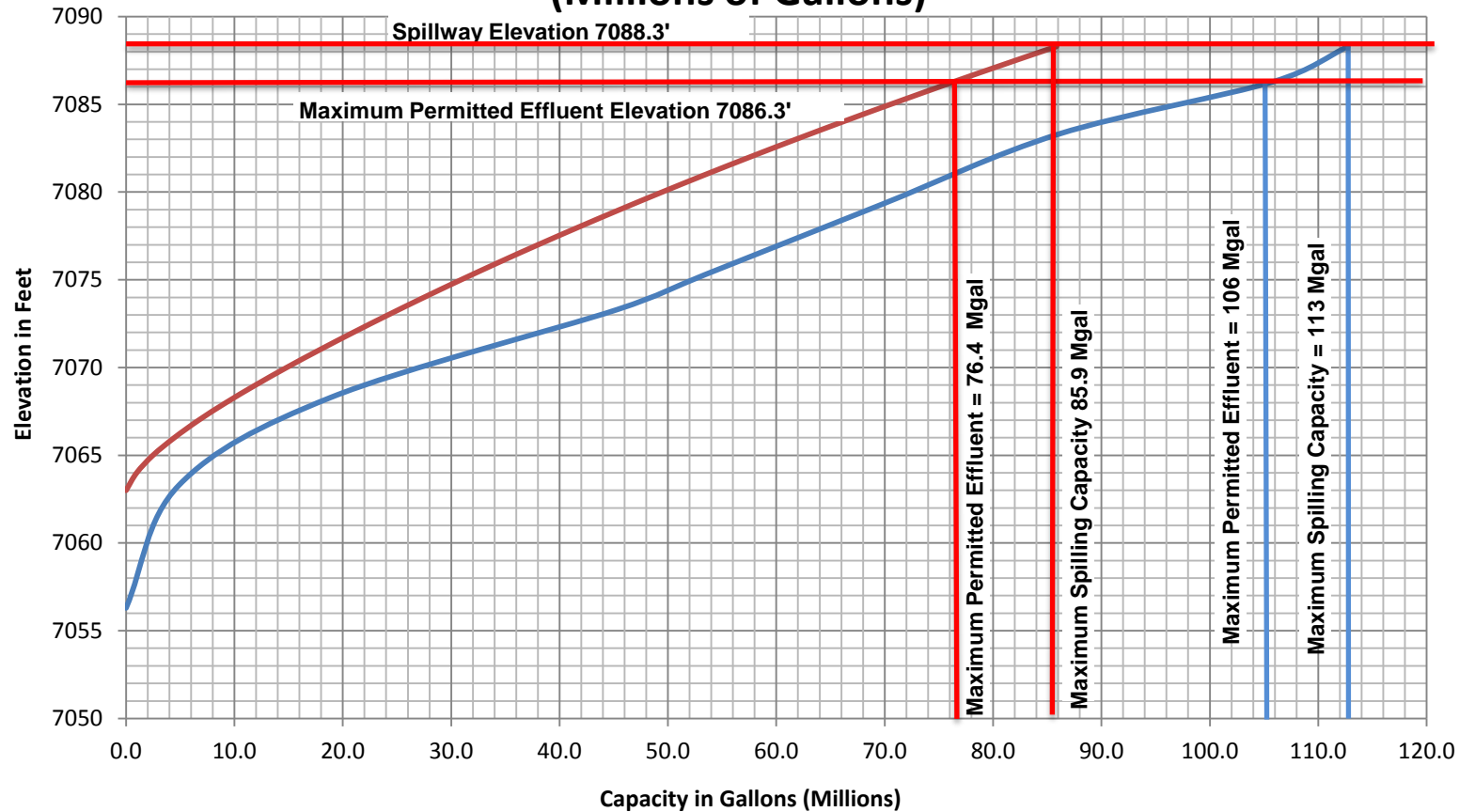
As of October 1, 2015 the reservoir was below minimum pool and contained less than 0.014 million gallons of effluent. Approximately 24 million gallons of treated effluent were applied to land during the 2015 disposal season (Table 3) with a maximum of approximately 36 acres of land utilized. The average monthly application rates during the peak disposal months of 2015 ranged from approximately 0.4 to 0.7 acre feet per acre per month, which is typical to slightly higher than irrigation application rates for most crops (measured at 0.5 to 0.6 acre feet/acre during peak months, Table H-10, DWR Bulletin 113-4). The application rates and area used for disposal by Bear Valley Water District maximized land disposal, to the extent feasible on suitable and available lands, and prevented carry over of stored effluent into the wet season.

BEAR VALLEY WATER DISTRICT, 2015 LAND DISPOSAL MAXIMIZATION REPORT

Appendix A Polishing Pond Capacity Curve
October 19, 2015

Appendix A Polishing Pond Capacity Curve

Bear Valley Water District Polishing Pond Capacity Curve (Millions of Gallons)



— Capacity Curve based on 1974 Bear Valley Sewage Treatment & Disposal Facilities System Drawings.
Maximum spilling capacity based upon Elev. 7088.3 and Maximum permitted effluent based upon Elev. 7086.3

— Capacity Curve based on 2013 Aerial Survey
Maximum spilling capacity based upon Elev. 7088.3 and Maximum permitted effluent based upon Elev. 7086.3

BEAR VALLEY WATER DISTRICT, 2015 LAND DISPOSAL MAXIMIZATION REPORT

Appendix B Irrigation Disposal Worksheets
October 19, 2015

Appendix B Irrigation Disposal Worksheets

Bear Valley Water District
2015 Irrigation Disposal Worksheets

Date	Area 1 9.59 Acres (MGD)	Area 1 N Applied (lbs)	Area 1 TDS Applied (lbs)	Area 2 7.5 Acres (MGD)	Area 2 N Applied (lbs)	Area 2 TDS Applied (lbs)	Area 3 4.96 Acres (MGD)	Area 3 N Applied (lbs)	Area 3 TDS Applied (lbs)	Area 4 14.39 Acres (MGD)	Area 4 N Applied (lbs)	Area 4 TDS Applied (lbs)
6/1/2015		0.0	0		0.0	0.0		0.0	0.0		0.0	0.0
6/2/2015		0.0	0		0.0	0.0		0.0	0.0		0.0	0.0
6/3/2015		0.0	0		0.0	0.0		0.0	0.0		0.0	0.0
6/4/2015		0.0	0		0.0	0.0		0.0	0.0		0.0	0.0
6/5/2015		0.0	0		0.0	0.0		0.0	0.0		0.0	0.0
6/6/2015		0.0	0		0.0	0.0		0.0	0.0		0.0	0.0
6/7/2015	0.115	5.9	105	0.083	4.3	75.9	0.035	1.8	32.5	0.049	2.5	45.1
6/8/2015		0.0	0		0.0	0.0		0.0	0.0		0.0	0.0
6/9/2015		0.0	0		0.0	0.0		0.0	0.0		0.0	0.0
6/10/2015		0.0	0		0.0	0.0		0.0	0.0		0.0	0.0
6/11/2015		0.0	0		0.0	0.0		0.0	0.0		0.0	0.0
6/12/2015	0.412	21.3	378	0.078	4.0	71.4	0.038	2.0	34.6	0.090	4.7	82.8
6/13/2015	0.116	6.0	106	0.135	7.0	124.3	0.044	2.3	40.5	0.089	4.6	81.3
6/14/2015		0.0	0		0.0	0.0		0.0	0.0		0.0	0.0
6/15/2015		0.0	0		0.0	0.0		0.0	0.0	0.065	3.4	59.8
6/16/2015	0.110	5.7	100	0.128	6.6	117.2	0.041	2.1	38.0		0.0	0.0
6/17/2015	0.093	4.8	85	0.105	5.4	96.0	0.033	1.7	30.5	0.076	3.9	69.7
6/18/2015	0.111	5.7	102	0.122	6.3	112.1	0.039	2.0	35.6	0.085	4.4	78.0
6/19/2015	0.112	5.8	103	0.125	6.5	115.0	0.040	2.1	36.9	0.073	3.8	66.7
6/20/2015		0.0	0	0.170	8.8	156.0	0.055	2.8	50.3	0.132	6.8	120.8
6/21/2015		0.0	0	0.155	8.0	141.8	0.050	2.6	45.4	0.100	5.2	91.8
6/22/2015		0.0	0		0.0	0.0		0.0	0.0		0.0	0.0
6/23/2015		0.0	0	0.152	7.8	139.1	0.049	2.5	45.1	0.118	6.1	108.5
6/24/2015		0.0	0	0.144	7.5	132.5	0.047	2.4	43.2	0.134	6.9	122.6
6/25/2015		0.0	0		0.0	0.0		0.0	0.0		0.0	0.0
6/26/2015		0.0	0		0.0	0.0		0.0	0.0		0.0	0.0
6/27/2015	0.151	7.8	138		0.0	0.0		0.0	0.0	0.121	6.2	110.6
6/28/2015	0.121	6.3	111	0.097	5.0	88.8	0.039	2.0	35.6	0.062	3.2	56.8
6/29/2015		0.0	0		0.0	0.0		0.0	0.0	0.123	6.3	112.4
6/30/2015	1.340	69	1229	1.494	77	1370	0.510	26	468	1.316	68	1207
Pounds/Acre:		6.929	123		10.297	183		5.278	94		4.724	84
Total Flow (MG):	4.659											
Total N (lbs):	241											
Total TDS (lbs)	4275											
Total N (mg/L):	6.2											
TDS (mg/L):	110											

Bear Valley Water District
2015 Irrigation Disposal Worksheets

Area 5 7.49 Acres (MGD)	Area 5 N Applied (lbs)	Area 5 TDS Applied (lbs)	Area 8 22.69 Acres (MGD)	Area 8 N Applied (lbs)	Area 8 TDS Applied (lbs)	Area 9 13.38 Acres (MGD)	Area 9 N Applied (lbs)	Area 9 TDS Applied (lbs)	MGD Applied/ 36.5 Acres	Pounds N Applied/ 36.5 Acres	Pounds TDS Applied/ 36.5 Acres
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.000	0	0
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.000	0	0
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.000	0	0
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.000	0	0
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.000	0	0
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.000	0	0
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.000	0	0
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.000	0	0
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.000	0	0
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.000	0	0
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.000	0	0
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.617	32	566
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.384	20	353
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.000	0	0
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.065	3	60
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.279	14	256
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.307	16	282
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.357	18	327
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.350	18	321
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.356	18	327
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.304	16	279
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.000	0	0
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.319	16	293
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.325	17	298
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.000	0	0
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.000	0	0
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.271	14	249
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.319	16	293
	0.0	0.0		0.0	0.0	0.000	0.0	0.0	0.123	6	112
0.000	0	0	0.000	0	0	0.000	0	0	4.659	241	4275
	0.000	0		0.000	0		0.000	0		7	117

Bear Valley Water District
2015 Irrigation Disposal Worksheets

Date	Area 1 9.59 Acres (MGD)	Area 1 N Applied (lbs)	Area 1 TDS Applied (lbs)	Area 2 7.5 Acres (MGD)	Area 2 N Applied (lbs)	Area 2 TDS Applied (lbs)	Area 3 4.96 Acres (MGD)	Area 3 N Applied (lbs)	Area 3 TDS Applied (lbs)	Area 4 14.39 Acres (MGD)	Area 4 N Applied (lbs)	Area 4 TDS Applied (lbs)
7/1/2014		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
7/2/2014	0.127	4.5	127.3	0.106	3.7	106.3	0.048	1.7	47.6		0.0	0.0
7/3/2014		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
7/4/2014		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
7/5/2014		0.0	0.0	0.118	4.1	118.3	0.053	1.8	52.7	0.131	4.6	131.4
7/6/2014	0.133	4.7	133.5	0.111	3.9	111.0	0.049	1.7	48.9		0.0	0.0
7/7/2014		0.0	0.0	0.088	3.1	88.3	0.035	1.2	34.6	0.124	4.4	124.6
7/8/2014		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
7/9/2014		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
7/10/2014		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
7/11/2014		0.0	0.0	0.102	3.6	101.9	0.049	1.7	49.5	0.109	3.8	109.6
7/12/2014	0.125	4.4	125.5	0.101	3.5	101.3	0.045	1.6	44.6	0.113	4.0	113.2
7/13/2014		0.0	0.0	0.114	4.0	113.7	0.045	1.6	45.2	0.120	4.2	120.0
7/14/2014	0.131	4.6	131.4		0.0	0.0		0.0	0.0	0.119	4.2	119.4
7/15/2014		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
7/16/2014	0.146	5.1	146.5		0.0	0.0		0.0	0.0	0.123	4.3	122.9
7/17/2014		0.0	0.0	0.080	2.8	79.8	0.051	1.8	51.0	0.119	4.2	119.4
7/18/2014	0.122	4.3	122.1	0.113	3.9	112.8	0.026	0.9	26.4	0.110	3.8	109.9
7/19/2014	0.104	3.6	103.9	0.088	3.1	88.0	0.035	1.2	35.4	0.078	2.7	78.3
7/20/2014		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
7/21/2014		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
7/22/2014		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
7/23/2014		0.0	0.0	0.108	3.8	108.1	0.044	1.5	43.9	0.122	4.3	122.3
7/24/2014	0.130	4.5	129.9		0.0	0.0		0.0	0.0	0.106	3.7	105.7
7/25/2014	0.119	4.2	119.1	0.114	4.0	113.6	0.050	1.7	49.7	0.116	4.1	116.4
7/26/2014	0.105	3.7	105.0	0.088	3.1	87.8	0.035	1.2	34.5	0.085	3.0	85.1
7/27/2014		0.0	0.0	0.102	3.6	101.9	0.041	1.4	41.0	0.119	4.2	119.4
7/28/2014		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
7/29/2014	0.111	3.9	111.0		0.0	0.0		0.0	0.0	0.108	3.8	108.3
7/30/2014		0.0	0.0	0.091	3.2	91.4	0.036	1.3	36.1	0.107	3.8	107.3
7/31/2014		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
Subtotals:	1.354	47	1355	1.523	53	1524	0.640	22	641	1.911	67	1913
Pounds/Acre:		4.946	141		7.114	203		4.523	160		4.650	133
Total Flow (MG):	5.429											
Total N (lbs):	190											
Total TDS (lbs)	5434											
Total N (mg/L):	4.2											
TDS (mg/L):	120											

Bear Valley Water District
2015 Irrigation Disposal Worksheets

Area 5 1.75 Acres (MGD)	Area 5 N Applied (lbs)	Area 5 TDS Applied (lbs)	Area 8 22.69 Acres (MGD)	Area 8 N Applied (lbs)	Area 8 TDS Applied (lbs)	Area 9 13.38 Acres (MGD)	Area 9 N Applied (lbs)	Area 9 TDS Applied (lbs)	MGD Applied/ 36.5 Acres	Pounds N Applied/ 36.5 Acres	Pounds TDS Applied/ 36.5 Acres
	0.0	0		0.0	0	0.000	0.0	0	0.000	0.000	0
	0.0	0		0.0	0	0.000	0.0	0	0.281	9.843	281
	0.0	0		0.0	0	0.000	0.0	0	0.000	0.000	0
	0.0	0		0.0	0	0.000	0.0	0	0.000	0.000	0
	0.0	0		0.0	0	0.000	0.0	0	0.302	10.584	302
	0.0	0		0.0	0	0.000	0.0	0	0.293	10.267	293
	0.0	0		0.0	0	0.000	0.0	0	0.247	8.663	248
	0.0	0		0.0	0	0.000	0.0	0	0.000	0.000	0
	0.0	0		0.0	0	0.000	0.0	0	0.000	0.000	0
	0.0	0		0.0	0	0.000	0.0	0	0.000	0.000	0
	0.0	0		0.0	0	0.000	0.0	0	0.261	9.136	261
	0.0	0		0.0	0	0.000	0.0	0	0.384	13.463	385
	0.0	0		0.0	0	0.000	0.0	0	0.279	9.762	279
	0.0	0		0.0	0	0.000	0.0	0	0.251	8.777	251
	0.0	0		0.0	0	0.000	0.0	0	0.000	0.000	0
	0.0	0		0.0	0	0.000	0.0	0	0.269	9.431	269
	0.0	0		0.0	0	0.000	0.0	0	0.250	8.757	250
	0.0	0		0.0	0	0.000	0.0	0	0.371	12.991	371
	0.0	0		0.0	0	0.000	0.0	0	0.305	10.690	305
	0.0	0		0.0	0	0.000	0.0	0	0.000	0.000	0
	0.0	0		0.0	0	0.000	0.0	0	0.000	0.000	0
	0.0	0		0.0	0	0.000	0.0	0	0.000	0.000	0
	0.0	0		0.0	0	0.000	0.0	0	0.274	9.600	274
	0.0	0		0.0	0	0.000	0.0	0	0.235	8.245	236
	0.0	0		0.0	0	0.000	0.0	0	0.399	13.960	399
	0.0	0		0.0	0	0.000	0.0	0	0.312	10.937	312
	0.0	0		0.0	0	0.000	0.0	0	0.262	9.179	262
	0.0	0		0.0	0	0.000	0.0	0	0.000	0.000	0
	0.0	0		0.0	0	0.000	0.0	0	0.219	7.675	219
	0.0	0		0.0	0	0.000	0.0	0	0.235	8.217	235
	0.0	0		0.0	0	0.000	0.0	0	0.000	0.000	0
0.000	0	0	0.000	0	0	0.000	0	0	5.429	190	5434
	0.000	0		0.000	0		0.000	0		5.210	149

Bear Valley Water District
2015 Irrigation Disposal Worksheets

Date	Area 1 9.59 Acres (MGD)	Area 1 N Applied (lbs)	Area 1 TDS Applied (lbs)	Area 2 7.5 Acres (MGD)	Area 2 N Applied (lbs)	Area 2 TDS Applied (lbs)	Area 3 4.96 Acres (MGD)	Area 3 N Applied (lbs)	Area 3 TDS Applied (lbs)	Area 4 14.39 Acres (MGD)	Area 4 N Applied (lbs)	Area 4 TDS Applied (lbs)	Area 5 1.75 Acres (MGD)
8/1/2014		0.0	0		0.0	0		0.0	0		0.0	0	0.000
8/2/2014	0.126	2.3	136	0.125	2.3	135	0.041	0.7	44	0.116	2.1	125	0.000
8/3/2014		0.0	0	0.115	2.1	125	0.038	0.7	41	0.113	2.1	123	0.000
8/4/2014	0.115	2.1	124		0.0	0		0.0	0		0.0	0	0.000
8/5/2014	0.114	2.1	123		0.0	0		0.0	0	0.114	2.1	124	0.000
8/6/2014		0.0	0		0.0	0		0.0	0	0.117	2.2	127	0.000
8/7/2014		0.0	0		0.0	0		0.0	0		0.0	0	0.000
8/8/2014		0.0	0		0.0	0		0.0	0	0.122	2.2	132	0.000
8/9/2014	0.101	1.9	110	0.117	2.1	126	0.036	0.7	39	0.083	1.5	90	0.000
8/10/2014	0.104	1.9	113	0.083	1.5	90	0.033	0.6	36	0.075	1.4	82	0.000
8/11/2014		0.0	0		0.0	0		0.0	0		0.0	0	0.000
8/12/2014	0.120	2.2	131		0.0	0		0.0	0	0.126	2.3	136	0.000
8/13/2014	0.115	2.1	125		0.0	0		0.0	0	0.124	2.3	135	0.000
8/14/2014	0.105	1.9	114		0.0	0		0.0	0	0.147	2.7	159	0.000
8/15/2014		0.0	0	0.145	2.7	157	0.067	1.2	72	0.101	1.9	110	0.000
8/16/2014	0.123	2.3	133	0.043	0.8	46	0.012	0.2	13	0.132	2.4	143	0.000
8/17/2014	0.115	2.1	125	0.035	0.7	38	0.014	0.3	15	0.110	2.0	119	0.000
8/18/2014		0.0	0		0.0	0		0.0	0		0.0	0	0.000
8/19/2014		0.0	0	0.097	1.8	105	0.041	0.7	44	0.117	2.2	127	0.000
8/20/2014		0.0	0	0.105	1.9	113	0.044	0.8	48	0.127	2.3	137	0.000
8/21/2014	0.101	1.8	109		0.0	0		0.0	0	0.105	1.9	113	0.000
8/22/2014	0.119	2.2	130	0.122	2.2	133	0.044	0.8	48	0.126	2.3	136	0.000
8/23/2014	0.134	2.5	146	0.147	2.7	159	0.042	0.8	46	0.141	2.6	153	0.000
8/24/2014	0.121	2.2	131	0.132	2.4	144	0.042	0.8	45	0.128	2.3	139	0.000
8/25/2014	0.112	2.1	121	0.119	2.2	130	0.036	0.7	39	0.093	1.7	101	0.000
8/26/2014	0.114	2.1	124	0.123	2.3	133	0.038	0.7	41	0.114	2.1	124	0.000
8/27/2014	0.095	1.7	103	0.097	1.8	106	0.028	0.5	30	0.047	0.9	51	0.000
8/28/2014	0.083	1.5	90		0.0	0		0.0	0	0.085	1.6	93	0.000
8/29/2014	0.203	3.7	220	0.131	2.4	143	0.041	0.8	45	0.125	2.3	135	0.000
8/30/2014	0.126	2.3	136	0.138	2.5	149	0.045	0.8	49	0.131	2.4	142	0.000
8/31/2014	0.133	2.4	144	0.125	2.3	136	0.041	0.7	44	0.126	2.3	137	0.000
Subtotals:	2.478	45	2687	2.001	37	2169	0.682	13	740	2.945	54	3193	0.000
Pounds/Acre:		4.741	280		4.894	289		2.524	149		3.755	222	
Total Flow (MG):	8.106												
Total N (lbs):	149												
Total TDS (lbs)	8788												
Total N (mg/L):	2.2												
TDS (mg/L):	130												

Bear Valley Water District
2015 Irrigation Disposal Worksheets

Area 5 N Applied (lbs)	Area 5 TDS Applied (lbs)	Area 8 22.69 Acres (MGD)	Area 8 N Applied (lbs)	Area 8 TDS Applied (lbs)	Area 9 13.38 Acres (MGD)	Area 9 N Applied (lbs)	Area 9 TDS Applied (lbs)	MGD Applied/ 36.5 Acres	Pounds N Applied/ 36.5 Acres	Pounds N applied per acre	Pounds TDS Applied/ 36.5 Acres	Pounds TDS applied per acre
0.0	0	0.000	0.0	0	0.000	0.0	0	0.000	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.407	7.461	0.204	441	12.08
0.0	0	0.000	0.0	0	0.000	0.0	0	0.266	4.880	0.134	288	7.90
0.0	0	0.000	0.0	0	0.000	0.0	0	0.115	2.103	0.058	124	3.40
0.0	0	0.000	0.0	0	0.000	0.0	0	0.228	4.176	0.114	247	6.76
0.0	0	0.000	0.0	0	0.000	0.0	0	0.117	2.152	0.059	127	3.48
0.0	0	0.000	0.0	0	0.000	0.0	0	0.000	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.122	2.236	0.061	132	3.62
0.0	0	0.000	0.0	0	0.000	0.0	0	0.337	6.190	0.170	366	10.02
0.0	0	0.000	0.0	0	0.000	0.0	0	0.296	5.435	0.149	321	8.80
0.0	0	0.000	0.0	0	0.000	0.0	0	0.000	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.246	4.518	0.124	267	7.31
0.0	0	0.000	0.0	0	0.000	0.0	0	0.239	4.392	0.120	260	7.11
0.0	0	0.000	0.0	0	0.000	0.0	0	0.252	4.617	0.126	273	7.47
0.0	0	0.000	0.0	0	0.000	0.0	0	0.313	5.750	0.158	340	9.31
0.0	0	0.000	0.0	0	0.000	0.0	0	0.309	5.674	0.155	335	9.19
0.0	0	0.000	0.0	0	0.000	0.0	0	0.274	5.029	0.138	297	8.14
0.0	0	0.000	0.0	0	0.000	0.0	0	0.000	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.255	4.680	0.128	277	7.58
0.0	0	0.000	0.0	0	0.000	0.0	0	0.275	5.054	0.138	299	8.18
0.0	0	0.000	0.0	0	0.000	0.0	0	0.205	3.767	0.103	223	6.10
0.0	0	0.000	0.0	0	0.000	0.0	0	0.412	7.555	0.207	446	12.23
0.0	0	0.000	0.0	0	0.000	0.0	0	0.464	8.518	0.233	503	13.79
0.0	0	0.000	0.0	0	0.000	0.0	0	0.423	7.760	0.213	459	12.56
0.0	0	0.000	0.0	0	0.000	0.0	0	0.360	6.612	0.181	391	10.70
0.0	0	0.000	0.0	0	0.000	0.0	0	0.389	7.137	0.196	422	11.55
0.0	0	0.000	0.0	0	0.000	0.0	0	0.267	4.907	0.134	290	7.94
0.0	0	0.000	0.0	0	0.000	0.0	0	0.168	3.091	0.085	183	5.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.500	9.182	0.252	543	14.86
0.0	0	0.000	0.0	0	0.000	0.0	0	0.439	8.053	0.221	476	13.04
0.0	0	0.000	0.0	0	0.000	0.0	0	0.425	7.800	0.214	461	12.63
0	0	0.000	0	0	0.000	0	0	8.106	148.727		8788	
0.000	0		0.000	0		0.000	0		4.075		241	

Bear Valley Water District
2015 Irrigation Disposal Worksheets

	Area 1			Area 2 7.5	Area 2 N		Area 3	Area 3 N	Area 3 TDS	Area 4	Area 4 N		Area 5
	9.59 Acres	Area 1 N	Area 1 TDS	Acres	Applied	Area 2 TDS	4.96 Acres	Applied	Applied	14.39 Acres	Applied	Area 4 TDS	1.75 Acres
Date	(MGD)	Applied (lbs)	Applied (lbs)	(MGD)	(lbs)	Applied (lbs)	(MGD)	(lbs)	(lbs)	(MGD)	(lbs)	Applied (lbs)	(MGD)
9/1/2015		0.0	0		0.0	0		0.0	0		0.0	0	0.000
9/2/2015		0.0	0	0.10124	0.0	0	0.04138	0.0	0	0.12382	0.0	0	0.000
9/3/2015	0.11626	0.0	0		0.0	0		0.0	0	0.12317	0.0	0	0.000
9/4/2015	0.10229	0.0	0		0.0	0		0.0	0	0.10753	0.0	0	0.000
9/5/2015	0.10303	0.0	0	0.08967	0.0	0	0.03809	0.0	0	0.10264	0.0	0	0.000
9/6/2015	0.12415	0.0	0	0.10848	0.0	0	0.04513	0.0	0	0.15120	0.0	0	0.000
9/7/2015	0.11538	0.0	0	0.09844	0.0	0	0.03158	0.0	0	0.12513	0.0	0	0.000
9/8/2015	0.11069	0.0	0	0.09235	0.0	0	0.00147	0.0	0	0.09385	0.0	0	0.000
9/9/2015	0.11336	0.0	0	0.09440	0.0	0	0.03930	0.0	0		0.0	0	0.000
9/10/2015		0.0	0		0.0	0		0.0	0	0.14207	0.0	0	0.000
9/11/2015	0.06820	0.0	0		0.0	0		0.0	0	0.22549	0.0	0	0.000
9/12/2015	0.00564	0.0	0		0.0	0		0.0	0	0.12969	0.0	0	0.000
9/13/2015	0.17088	0.0	0	0.07964	0.0	0	0.00785	0.0	0	0.04138	0.0	0	0.000
9/14/2015		0.0	0		0.0	0		0.0	0		0.0	0	0.000
9/15/2015		0.0	0		0.0	0		0.0	0		0.0	0	0.000
9/16/2015		0.0	0		0.0	0		0.0	0		0.0	0	0.000
9/17/2015	0.13412	0.0	0		0.0	0		0.0	0	0.15054	0.0	0	0.000
9/18/2015	0.13259	0.0	0		0.0	0		0.0	0	0.15054	0.0	0	0.000
9/19/2015	0.12216	0.0	0	0.12920	0.0	0	0.01277	0.0	0	0.13132	0.0	0	0.000
9/20/2015	0.12878	0.0	0	0.13148	0.0	0	0.03457	0.0	0	0.13458	0.0	0	0.000
9/21/2015	0.12418	0.0	0	0.12751	0.0	0	0.01095	0.0	0	0.13751	0.0	0	0.000
9/22/2015	0.10652	0.0	0	0.10561	0.0	0	0.00453	0.0	0	0.05442	0.0	0	0.000
9/23/2015	0.10323	0.0	0	0.10030	0.0	0	0.00114	0.0	0	0.05279	0.0	0	0.000
9/24/2015	0.15755	0.0	0		0.0	0		0.0	0	0.18965	0.0	0	0.000
9/25/2015		0.0	0		0.0	0		0.0	0		0.0	0	0.000
9/26/2015		0.0	0		0.0	0		0.0	0		0.0	0	0.000
9/27/2015		0.0	0		0.0	0		0.0	0		0.0	0	0.000
9/28/2015		0.0	0		0.0	0		0.0	0		0.0	0	0.000
9/29/2015		0.0	0		0.0	0		0.0	0		0.0	0	0.000
9/30/2015		0.0	0		0.0	0		0.0	0		0.0	0	0.000
Subtotals:	2.03902	0	0	1.25831	0	0	0.26876	0	0	2.36731	0	0	0.000
Pounds/Acre:		0.000	0		0.000	0		0.000	0		0.000	0	
Total Flow (MG):	5.933												
Total N (lbs):	0												
Total TDS (lbs)	0												
Total N (mg/L):	0												
TDS (mg/L):	0												

Bear Valley Water District
2015 Irrigation Disposal Worksheets

Area 5 N Applied (lbs)	Area 5 TDS Applied (lbs)	Area 8 22.69 Acres (MGD)	Area 8 N Applied (lbs)	Area 8 TDS Applied (lbs)	Area 9 13.38 Acres (MGD)	Area 9 N Applied (lbs)	Area 9 TDS Applied (lbs)	MGD Applied/ 36.5 Acres	Pounds N Applied/ 36.5 Acres	Pounds N applied per acre	Pounds TDS Applied/ 36.5 Acres	Pounds TDS applied per acre
0.0	0	0.000	0.0	0	0.000	0.0	0	0.00000	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.26645	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.23944	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.20982	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.33344	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.42895	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.37053	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.29835	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.24706	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.14207	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.29369	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.13533	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.29975	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.00000	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.00000	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.00000	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.28466	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.28313	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.39545	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.42941	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.40015	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.27108	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.25746	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.34719	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.00000	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.00000	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.00000	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.00000	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.00000	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.00000	0.000	0.000	0	0.00
0.0	0	0.000	0.0	0	0.000	0.0	0	0.00000	0.000	0.000	0	0.00
0	0	0.000	0	0	0.000	0	0	5.93339	0.000		0	
0.000	0		0.000	0		0.000	0		0.000		0	

INPUT DATA

PARAMETER / MONTH	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	ANNUAL
DAYS IN MONTH	30	31	31	28	31	30	31	30	31	31	30	31	365
AVG PAN EVAP (IN)	0.89	0.61	0.76	0.83	2.14	3.69	5.34	6.64	7.63	6.87	5.17	3.05	43.62
ACTUAL PRECIP (IN)	10.66	20.00	2.84	10.62	21.42	3.37	4.65	1.57	1.66	0.00	1.86	4.35	83.00
ACTUAL SNOW ACCUM (IN Water) ₃₀	7.82	23.83	26.08	36.04	53.71	41.62	22.88	0.00	0.00	0.00	0.00	2.96	
ACTUAL SNOW MELT IN MONTH (IN Water)	0.00	0.00	0.36	0.12	0.71	13.40	21.11	22.88	0.00	0.00	0.00	1.42	60.00
ACTUAL NEW SNOW IN MONTH (IN Water)	7.82	16.01	2.61	10.08	18.38	1.30	2.37	0.00	0.00	0.00	0.00	1.53	60.11
ESTIMATED MAX PERCOLATION (IN) ₃₀	10.0	29.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.0
# OF ADDITIONAL CONNECTIONS (RLU)	245	245	245	245	245	245	245	245	245	245	245	245	
ADDITIONAL INFLUENT FLOW (GAL/D)	49,245	49,245	49,245	49,245	49,245	49,245	49,245	49,245	49,245	49,245	49,245	49,245	
90TH PERCENTILE EXISTING FLOWS (Avg. GAL/D)	37,533	78,484	86,645	110,250	127,968	190,833	191,065	135,533	78,548	66,774	41,733	34,022	
TOTAL INFLUENT FLOW (GAL/D)	86,778	127,729	135,890	159,495	177,213	240,078	240,310	184,778	127,793	116,019	90,978	83,277	

	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	ANNUAL
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POLISHING RESERVOIR													
PERCOLATION (IN)	10.00	29.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	39.00
PERC. VOLUME (gal)	1,535,438	6,780,780	0	0	0	0	0	0	0	0	0	0	8,316,218
W.S. AREA (ac) ₃	5.65	8.61	9.79	10.21	11.14	12.25	12.25	12.25	12.25	11.61	9.85	7.75	
EVAP. VOLUME (gal)	76,772	93,528	132,879	138,562	393,211	731,766	1,430,270	1,762,891	2,028,988	1,734,058	1,096,207	399,889	10,019,021
PRECIP. VOLUME (gal)	5,017,132	9,573,558	1,368,515	5,129,548	10,400,329	1,646,441	2,271,795	767,036	811,006	0	896,581	2,072,091	39,954,032
MONTHLY AVAIL. SNOWMELT (IN) ₃	0.00	0.00	0.36	0.12	0.71	13.40	21.11	22.88	0.00	0.00	0.00	1.42	60.00
ESTIMATED SNOW CONTR. (%) ₆	0%	0%	0%	0%	0%	0%	45%	28%	0%	0%	0%	0%	
ESTIMATED AREA OF INFLUENCE (ac)	50	50	50	50	50	50	50	50	50	50	50	50	
ESTIMATED INFUX TO STORAGE (gal) ₆	0	0	0	0	0	0	12,897,727	8,697,780	0	0	0	0	21,595,507
RESERVOIR DISPOSAL(GAIN) (gal)	(3,404,922)	(2,699,250)	(1,235,637)	(4,990,986)	(10,007,118)	(914,674)	(13,739,251)	(7,701,925)	1,217,982	1,734,058	199,627	(1,672,202)	(43,214,299)

IRRIGATION DISPOSAL (gal) _m	0	0	0	0	0	0	0	0	10,796,000	22,361,000	17,521,000	11,999,000	62,677,000
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MAXIMUM STORAGE (MG).....	51.00
AVAILABLE STORAGE (MG).....	76.43

ANNUAL INFLOW (MG)		AMOUNT DISCHARGED TO BLOODS CREEK.....	50.62	OVERALL BALANCE	
WASTEWATER	53.80	EVAPORATION	12.59	UNUSED DISPOSAL CAPACITY (MG)	0.05
PRECIPITATION	47.10	PERCOLATION	-0.07	(MUST NOT BE NEGATIVE)	
SNOW INFILUX (MG)	<u>21.60</u>	IRRIGATION	<u>62.68</u>	UNUSED STORAGE CAPACITY (MG)	25.43
TOTAL	122.49	TOTAL	125.81	(MUST NOT BE NEGATIVE)	

(h) Not used in calculations