



**Cherokee Metropolitan District
Water Reclamation Facility
Total Dissolved Solids
Source Control Report
Compliance Order on Consent
Number: MC-140514-1**



March 31, 2016

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March 31, 2016

Ms. Mandy Mercer
Enforcement Specialist
Clean Water Enforcement Unit
Water Quality Control Division
Colorado Department of Public Health and Environment
4300 Cherry Creek Drive South
Denver, CO 80246-1530

RE: Compliance Order on Consent, Number MC-140514-1, Cherokee Metropolitan District Water Reclamation Facility - Source Control Report

Dear Ms. Mercer:

As required by the Compliance Order on Consent executed by the Colorado Department of Public Health and Environment's Water Quality Control Division, effective June 23, 2014, Cherokee Metropolitan District has prepared a Source Control Report. The Source Control Report summarizes the results of the first year of efforts to reduce the potable water supply total dissolved solids concentrations, thereby impacting wastewater effluent concentrations.

Please let us know if you have any questions or would like to discuss the results of this report. You can reach me at 719-597-5080, schambers@cherokeemetro.org, or Will Koger, the engineering team's project manager, at 720-232-6644, wkoger@forsgren.com.

Sincerely,

A handwritten signature in blue ink, appearing to read "Sean P. Chambers".

Sean Chambers
General Manager

Attachments

cc: Will Koger, Forsgren Associates
Bill Veydovec, Hatch Mott MacDonald
Dave Akers, Consultant
Mike Poeckes, ORC- Cherokee Metropolitan District WRF
Jan Cederberg, Board President, Cherokee Metropolitan District
Connie King, Environmental Legal Counsel
Ryan Malarky, General Legal Counsel
Brian Beaudette, Compliance Administrator, Cherokee Metro District

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CHAPTER 1

INTRODUCTION AND BACKGROUND

CHAPTER 1 INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

On May 14, 2014, Cherokee Metropolitan District (CMD) received an executed Compliance Order on Consent (COC) from the Colorado Department of Public Health and Environment (CDPHE).¹ As set forth in this COC, CMD must meet several milestones toward coming into compliance with the TIN and TDS permit limits. The purpose of this report is to summarize the efforts that have been made by CMD to achieve progress towards the source control tasks defined in the *Cherokee Metropolitan District Water Reclamation Facility Total Dissolved Solids Compliance Implementation Plan* (Implementation Plan), revised April 17, 2015.²

1.2 BACKGROUND

Cherokee Metropolitan District (CMD) is a quasi-municipal governmental entity located just outside the city limits of Colorado Springs, Colorado in El Paso County. Established in 1957, CMD serves approximately 23,000 customers, and the main service area known as Cimarron Hills, encompasses approximately 6,300 acres. In addition to the main service area, CMD provides water and/or wastewater service to Ellicott, Schriever Air Force Base (SAFB), and the Meridian Service Metropolitan District (MSMD). An overview of CMD's water and wastewater systems and associated district service area boundaries are shown in Figure 1.1.

CMD completed construction of its Wastewater Reclamation Facility (WRF) in 2010. The facility has a permitted hydraulic capacity of 4.8 mgd and a permitted organic loading rate of 8,835 lb/day. The treated effluent (reclaimed water) is conveyed approximately four miles to a complex of 10 rapid infiltration basins (RIBs) for recharge to the Upper Black Squirrel Creek Designated Basin (UBSC) aquifer. In May 2010, a permit authorizing the discharge of reclaimed water to groundwater through the RIBs was approved. From monthly Discharge Monitoring Reports (DMRs) submitted for various water quality parameter concentrations under the approved permit, it was determined that the WRF effluent exceeded the permit limit for total inorganic nitrogen (TIN) and total dissolved solids (TDS) at monitoring wells located at the RIB site.

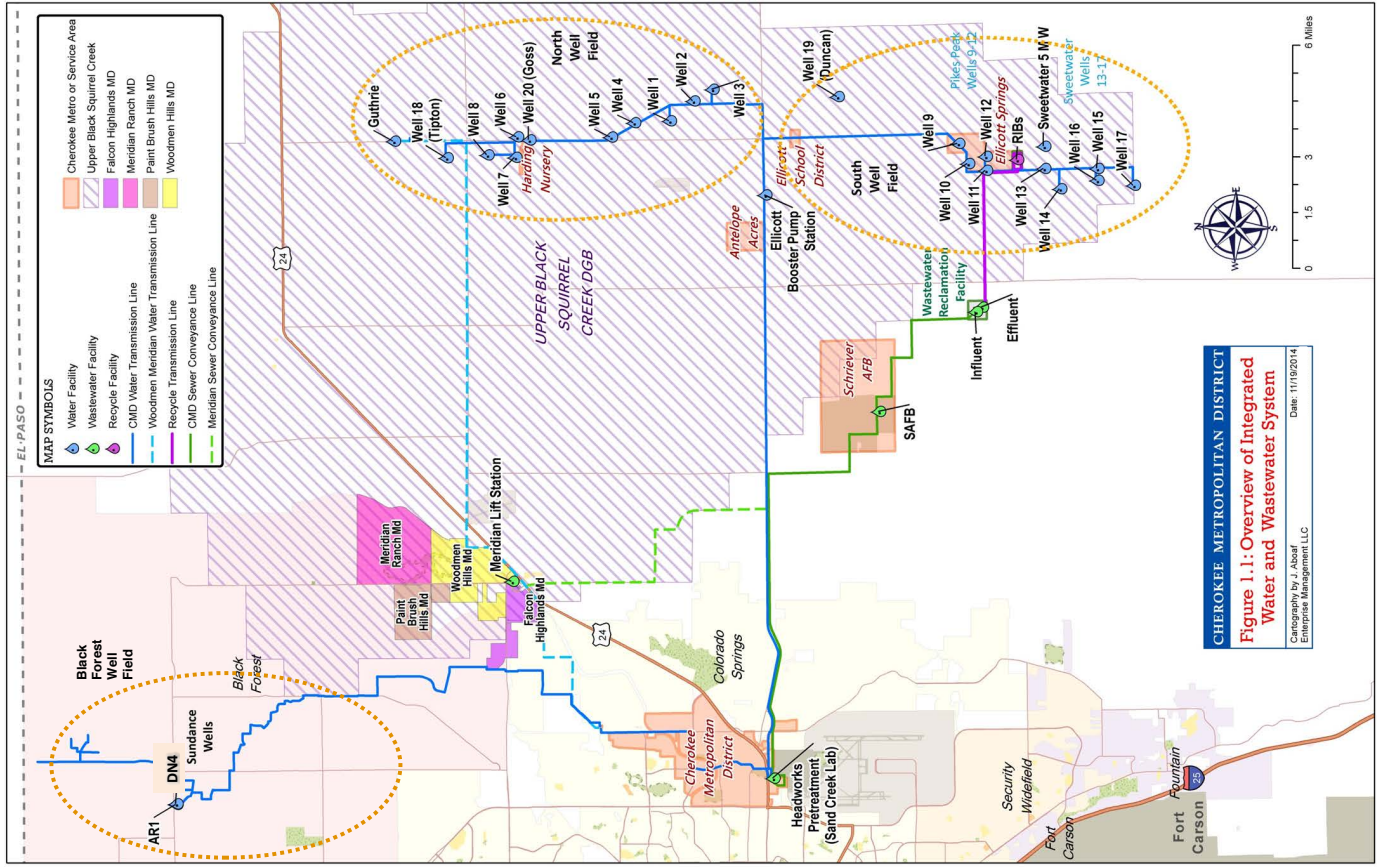
1.3 WATER SYSTEM

CMD's water system is shown in blue in Figure 1.1 (dashed blue lines are owned by other districts). CMD owns only groundwater supplies, but it has taken delivery of some treated surface water from the Colorado Springs Utilities (CSU) system under a temporary lease arrangement in recent years, while it developed additional supplies.

¹ *Compliance Order on Consent, Number: MC-140514-1*. Received May 14, 2014. Effective June 23, 2014. State of Colorado, Department of Public Health and Environment, Water Quality Control Division.

² *Cherokee Metropolitan District Water Reclamation Facility Total Dissolved Solids Compliance Implementation Plan*. Compliance Order on Consent Number: MC-140514-1. Revised: April 17, 2015. Forsgren Associates, Inc. and Hatch Mott MacDonald.

UBSC aquifer water makes up the majority (approximately 85%) of the existing water supply for the District. This alluvial source is divided between two distinct categories: exportable and non-exportable. To address its water supply limitations, CMD has recently developed the Sundance well field in the Black Forest area, a nonrenewable Denver Basin groundwater supply. CMD also holds additional Denver Basin water rights in that area for future development when needed.



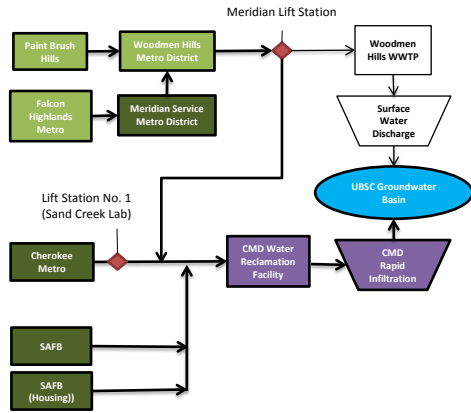
1.4 WASTEWATER SYSTEM

The wastewater collection system is shown in green in Figure 1.1 (dashed green lines are owned by other districts), with the reclaimed water line shown in purple. CMD primarily provides wastewater service to Cimarron Hills, but also takes flow from connectors such as SAFB and MSMD.

Wastewater is conveyed to the WRF, which uses biological treatment with sequencing batch reactors (SBRs) to provide carbon oxidation (organic carbon removal), nitrification (ammonia removal), and denitrification (nitrate removal). Following the SBRs, water flows to an equalization basin prior to ultraviolet light (UV) disinfection (microorganism destruction and inactivation). Reclaimed water is then conveyed by gravity to the District’s RIBs, where it percolates back into the UBSC aquifer. CMD also provides some of the reclaimed water to an agricultural user for irrigation.

Figure 1.2 presents a wastewater collection system schematic showing the sources of wastewater treated at the WRF. In addition to treating wastewater from its own service area, the CMD provides wastewater treatment for MSMD and SAFB.

Figure 1.2
Wastewater Collection System Schematic



Pursuant to an intergovernmental agreement (IGA) with CMD, MSMD shared the costs to develop the WRF for a share of capacity in the WRF. Flow from MSMD, Woodmen Hills, Falcon Highlands and Paint Brush Hills Metro Districts are comingled at the Meridian Lift Station. A portion of the combined flow is pumped to the Woodmen Hills Wastewater Treatment Plant, and the rest is conveyed south to the WRF and allocated to MSMD's share of capacity.

CMD also has an agreement to provide wastewater treatment for SAFB. The planning for the WRF projected an average wastewater flow from SAFB of 0.23 MGD. The majority of this flow is made up of residential flow and typical municipal wastewater. A relatively small percentage of the total flow, approximately 3,000 to 5,000 gpd, is industrial discharge from boiler and cooling tower operations. The agreement between CMD and SAFB provides that SAFB is subject to CMD's industrial pretreatment program.

1.5 SOURCE CONTROL GOALS

The sources of TDS in CMD's wastewater were discussed and presented in the Feasibility Study, revised April 17, 2015.³ CMD is currently implementing a number of source control activities outlined in the Implementation Plan. Over the past year, CMD has gathered and evaluated TDS data to try to determine the TDS reduction due to their source control actions.

The source control tasks identified in the Implementation Plan are presented below.

1. Reduce the use, to the extent possible, of high-TDS drinking water wells.
2. Complete the augmentation plan on the Sundance Dawson well, then construct and put the new well into operation.
3. Evaluate implementation of the Black Forest, Phase 2 wells at Shiloh Ranch and County Line Estates.
4. Continue working with industrial dischargers to implement their use of BMPs.
5. Continue implementing and communicating residential softener moratorium passed in November 2014.
6. Investigate potential to expand agricultural reuse to reduce TDS loading to RIBs during the growing season.

The progress and current status of each of these efforts is discussed in Chapter 2.

³ *Cherokee Metropolitan District Water Reclamation Facility Total Dissolved Solids Compliance Feasibility Study*. Compliance Order on Consent Number: MC-140514-1. Revised: April 17, 2015. Forsgren Associates, Inc. and Hatch Mott MacDonald.

CHAPTER 2

SOURCE CONTROL ACTIVITIES

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SOURCE CONTROL ACTIVITIES

2.1 GENERAL

This chapter presents information regarding the progress of source control activities implemented by CMD. These activities include the reduction in use of high-TDS wells, construction and operation of additional wells, enhanced use of BMPs by industrial dischargers, continued implementation of residential softener moratorium, and investigation of potential expansion of agricultural reuse to reduce TDS loading to the RIBs.

2.2 REDUCED USE OF HIGH-TDS DRINKING WATER WELLS

One method of reducing the TDS of the reclaimed water is to reduce the TDS of the water supply through the identification and reduction in use of high-TDS drinking water supply wells. In 2015, CMD's water supply well system may be broken down into three areas: North Well Field, South Well Field and the recently developed Black Forest Sundance Well Field. The North and South Well Fields supply water from the UBSC Basin while the Black Forest Sundance Well Field supplies water from the Denver Basin. The locations of these well fields are identified in Figure 1.1. Average 2015 TDS concentrations for each supply well are listed in Table 2.1.

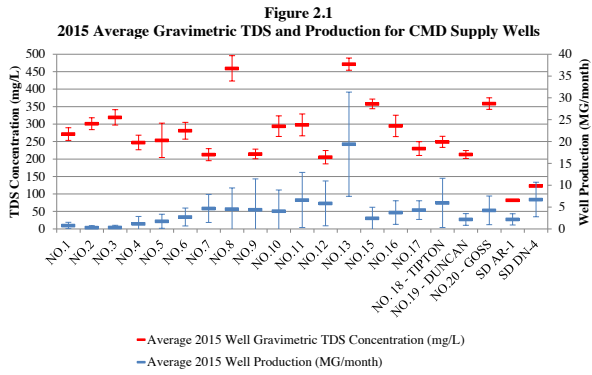
Table 2.1**2015 Average Gravimetric TDS Concentrations for CMD Supply Wells Used in 2015**

Well	# of TDS Samples	Average TDS (mg/L)	Min/Max TDS (mg/L)
North Well Field			
No. 1	7	271	244 / 300
No. 2	8	301	280 / 328
No. 3	8	319	296 / 356
No. 4	6	247	228 / 288
No. 5	8	254	208 / 336
No. 6	8	281	244 / 320
No. 7	8	213	192 / 248
No. 8	8	460	416 / 504
No. 18 – Tipton	8	249	216 / 264
No. 20 – Goss	8	359	324 / 384
South Well Field			
No. 9	8	215	196 / 244
No. 10	8	294	264 / 344
No. 11	29	298	246 / 372
No. 12	26	205	144 / 244
No. 13*	8	472	432 / 492
No. 15*	7	358	336 / 376
No. 16*	6	295	268 / 348
No. 17*	8	230	208 / 268
No. 19 – Duncan	8	213	192 / 228
Black Forest Sundance Well Field			
Sundance AR-1	4	82	81.8 / 82.9
Sundance DN-4	2	123	121.6 / 124.7

*Located south of the RIBs

Average TDS concentrations in the North Well Field range from 213 to 460 mg/L and from 205-472 mg/L in the South Well Field. Supply wells that are downgradient of the RIBs include No. 13, 15, 16, 17, and Sweetwater 5. The highest average TDS concentrations are found in Wells No 8, 13, 15 and 20 – Goss.

Figure 2.1 combines 2015 average gravimetric TDS concentrations and average well flow for CMD supply wells. The deviation bars represent +/- one standard deviation of measured values.



Wells No. 8, 13, 15 and 20 – Goss are CMD’s highest TDS drinking water supply wells. The most effective wells to target for a reduction in production are No. 8 and 13 based on the combination of high TDS concentration and production. In particular, Well No. 13 has the highest average TDS concentration and is the largest producing well by a significant amount. Figure 2.2 shows reduction in production for Wells No. 8 and 13 during the later months of 2015. Adjustments to well production must balance other factors in addition to TDS concentration such as water rights, nitrate concentration, and well production capacity.

Figure 2.2
Monthly Well Production for Selected High-TDS Wells
(January 2015 – February 2016)

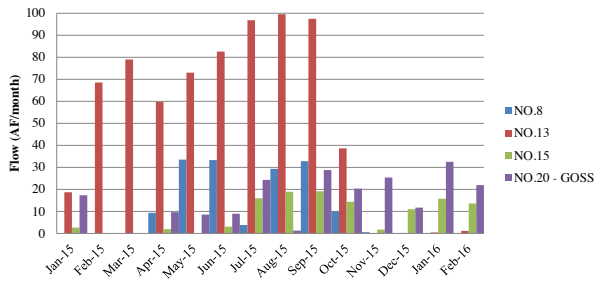


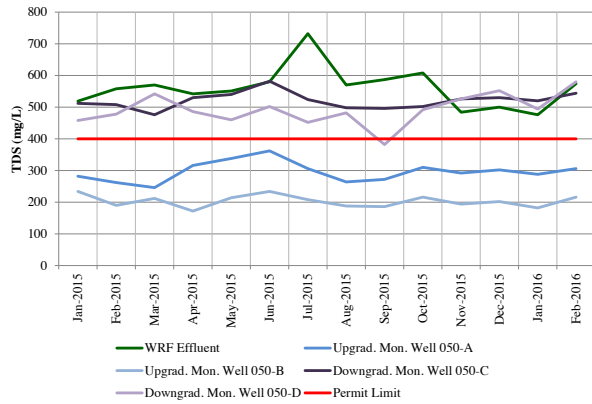
Table 2.2 presents the combined flow of the high-TDS drinking water wells identified in Figure 2.2 as a percentage of the total drinking water supply well flow. A larger percentage of production contribution from high-TDS drinking water wells results in an increased water supply TDS concentration.

Table 2.2
High-TDS Contribution for Supply Wells Production

Month	High-TDS Production	Total Drinking Water Supply Production	High-TDS Percentage of Total Production
January 2015	38.8	180.8	21%
February 2015	68.6	173.2	40%
March 2015	79.0	187.7	42%
April 2015	80.7	251.2	32%
May 2015	115.2	271.9	42%
June 2015	127.9	292.3	44%
July 2015	141.0	321.8	44%
August 2015	149.3	368.4	41%
September 2015	178.2	375.6	47%
October 2015	83.4	257.7	32%
November 2015	28.0	145.2	19%
December 2015	23.0	165.4	14%
January 2016	48.9	155.8	31%
February 2016	36.8	127.0	29%

TDS concentrations in the WRF effluent and compliance monitoring wells are presented from January 2015 through February 2016 in Figure 2.3.

Figure 2.3
WRF Effluent and Monitoring Wells Average TDS
(January 2015 - February 2016)

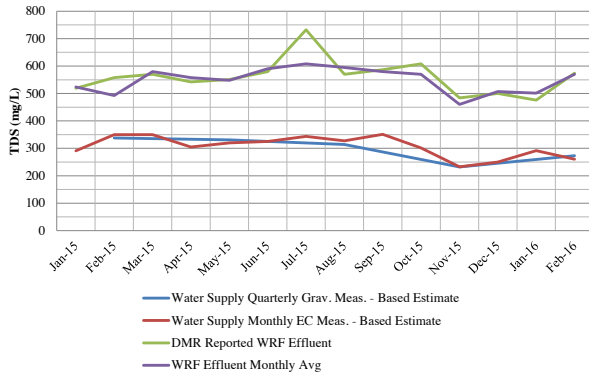


In general, gravimetric TDS concentrations in the WRF effluent have remained between 500 and 600 mg/L. This trend is reflected at the permit compliance points, downgradient monitoring wells 050-C and 050-D, with a slightly lower range. TDS concentrations in upgradient monitoring wells 050-A (Well No. 11) and 050-B (Well No. 12) have remained relatively consistent over this period.

Figure 2.4 shows WRF effluent TDS concentration compared to estimated water supply system TDS from January 2015 through February 2016. Two different data sets were used to estimate water supply TDS: gravimetric TDS measurements and electrical conductivity (EC) probe measurements. Gravimetric TDS measurements are made quarterly at the operating supply wells. TDS was calculated from conductivity $\mu\text{S}/\text{cm}$ using a conversion of $640 \times \text{EC}$ as stipulated in Water Quality Policy #24.⁴ Conductivity is not currently measured at the Sundance wells, so it was necessary to estimate based on TDS measurements made from June 2015 through February 2016.

⁴ Water Quality Policy #24 – Implementing Narrative Standards in Discharge Permits for the Protection of Irrigated Crops. March 8, 2008. Colorado Water Quality Control Division.

Figure 2.4
Estimated Water Supply and WRF Effluent TDS Concentrations
(January 2015 to February 2016)



WRF effluent TDS appears to reflect the incoming water supply TDS as would be expected, demonstrating a relationship between source control and WRF effluent TDS reduction. Two exceptions are identified in July 2015 and October 2015 DMR reported values. The DMR reported TDS of 732 mg/L for the WRF effluent in July 2015 is 124 mg/L higher than the gravimetric average TDS for that month. The DMR reported value of 608 mg/L for the WRF effluent in October 2015 is 38 mg/L higher than the gravimetric average TDS for that month. Using the monthly average TDS concentration demonstrates a general relationship between water supply and WRF effluent TDS, as expected.

Reduction of high-TDS wells will help to reduce the supply TDS concentration. However, it was identified in the Feasibility Study that in 2013 the typical TDS increase from domestic water use in CMD's service area was 204 mg/L. The typical TDS increase from water supply to WRF effluent ranges from 200 to 250 mg/L which is consistent with the expected range of 150-380 mg/L.⁵ In 2015, the calculated TDS increase from domestic water use in CMD's service area is typically 235 mg/L.

As TDS increase from domestic use has remained relatively consistent throughout the system as a whole, a decrease in the supply wells TDS for the main service area would have a direct impact on the WRF influent and reclaimed water TDS concentration, shown in Figure 2.4. Schriever Air Force Base presents two different domestic contributions. At the base, the typical increase in TDS due to use is 638 mg/L compared to a 136 mg/L increase from the housing.

⁵ Water Engineering Treatment and Reuse. 2003. Metcalf & Eddy.

Figures 2.5 and 2.6 present the average TDS loading to the WRF from CMD’s main service area and each bulk user in 2013 and 2015.

Figure 2.5

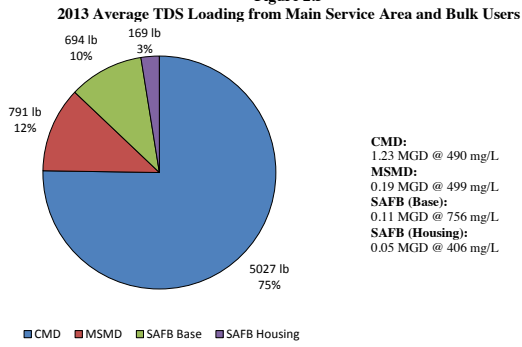
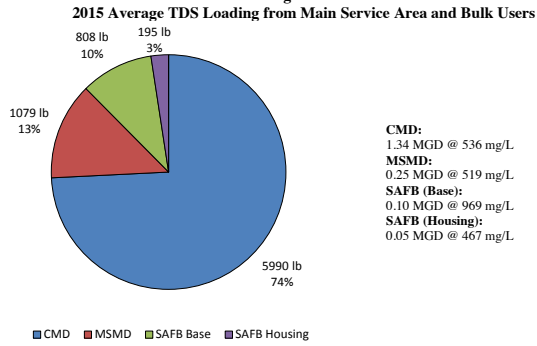


Figure 2.6



In 2015, 74%, of the TDS loading came from CMD’s main service area, which made up 78% of the total flow to the WRF. These percentages are consistent with the reported Feasibility Study 2013 values of 75% TDS loading and 78% of total flow from CMD users.

2.3 ENHANCED USE OF BMPS BY INDUSTRIAL DISCHARGERS

In 2015, CMD has continued to work with industrial dischargers to enhance their use of BMPS. On a discharger-specific basis, CMD staff has reviewed completed BMPS during annual industrial discharger inspections. Collaboration with the industrial dischargers results in improvements and new ideas aimed at improving the effectiveness of existing BMP plans. Additionally, CMD staff work with industrial dischargers on new system and process options with a focus on reducing TDS concentrations in the discharge.

Below are several specific examples of coordination efforts with industrial dischargers.

- Schriever Air Force Base has reduced the water softener salt usage on base 40% after initiating the BMP program that evaluated each TDS discharge area. This was due to increase testing of the brine barrel from 1 time a week to 3 times a week. The old system was adding a bag or so a day without knowing if they were truly needed.
- Woodford Manufacturing decided to install an evaporative system on their discharge due to increased evaluation on their TDS discharges related to their BMP program. They have reduced the amount of water sent to their treatment system with the goal of eventually becoming a zero discharge user. The reduction of the amount being treated is directly related to the amount of TDS being discharged.
- The TDS BMPS have lead Weatherford Inc. to change the treatment system process to avoid increasing TDS levels during higher production periods. This will lead to less TDS being discharged continuously as well as the spikes seen during busier periods.

Currently, TDS sampling at each facility is underway to determine the effectiveness of the BMP. CMD will continue to work with industrial dischargers to enhance the use of BMPS to reduce discharge TDS concentrations.

2.4 EVALUATION OF ADDITIONAL WELL SOURCES

CMD has started up two Denver Basin wells recently constructed in the Black Forest area as part of Phase 1 of the Black Forest Sundance well field. Initial TDS results from this source are lower than CMD's UBSC wells, which may result in a reduction of the wastewater effluent TDS. Sundance Well AR-1 came online in June 2015 and Sundance Well DN-4 began producing in September 2015. TDS concentrations in these wells range from 82 to 125 mg/L. The remaining Phase I Sundance wells are anticipated to be online in 2018, subject to approval of an Augmentation Plan for the Dawson wells. Incorporating these wells into the CMD supply portfolio provides low-TDS alternatives to offset existing high-TDS well options. At this point there is not enough information available to characterize the Dawson location and as a result, the Augmentation Plan has not received approval. Table 2.3 outlines the current status of the Black Forest Phase 1 wells.⁶

⁶ Cherokee Metropolitan District Update of Commitments and Supplies for Colorado Division of Water Resources – Technical Memo, March 1, 2016. Prepared by Forsgren Associates, Inc.

Table 2.3
Black Forest Phase 1 Wells (Denver Basin Water)

Well	Alternate Name	Decreed (AF)	Planned Production (AF)	Online
SD-AR-1	Sundance Arapahoe	147.7	139.7	2015
SD-DN-(1-3)	Sundance Denver	328.5	107.3	TBD
SD-DN-4	Sundance Denver	*	*	2015
SD-DA-1	Sundance Dawson	265.3	TBD	2018
	Sundance LFH	108.5		
	Shamrock East Arapahoe**	280.0	**	2015
SE-DN-(1-5)	Shamrock East Denver	600.0	196.0	TBD
SE-DA-1	Shamrock East Dawson	390.0	TBD	2019
	Shamrock East LFH	6.0		

*Sundance Denver SD-DN-4 is currently operating using water rights allocated to SD-DN-(1-3)

**Shamrock East Arapahoe water rights are accessed by the Sundance Arapahoe SD-AR-1

Evaluation of Black Forest, Phase 2 Wells at Shiloh Ranch and County Line Estates is in the preliminary planning stages. The Phase 2 wells are anticipated to be online beginning in 2018. Table 2.4 outlines the current status of the Black Forest Phase 2 wells.

Table 2.4
Black Forest Phase 2 Wells (Denver Basin Water)

Well	Alternate Name	Decreed (AF)	Planned Production (AF)	Online
SL-AR-1	Shiloh Arapahoe	220.0	72.0	2018
SL-DN-(1-4)	Shiloh Denver	351.0	114.6	TBD
SL-DA-1	Shiloh Dawson	340.2*	27.7	2018
	Shiloh LFH	137.0		
CLE-AR-1	County Line Arapahoe	127.595	41.7	2018
CLE-DN-(1-2)	County Line Denver	209.0	69.7	TBD
CLE-DA-1	County Line Dawson	155.595	TBD	2018
	County Line LFH	0.0		

*SL-DA-1 (Shiloh Dawson) – Total Decreed water rights reduced from 376 AF to 340.2 AF after removing on-site uses by residents.

Table 2.5 presents results of a projection of the reduction in source TDS from maximizing the inclusion of the Black Forest Phase 1 and 2 wells from 2016-2019, using the planned production values listed in Tables 2.2 and 2.3 as these wells come online. 2015 average gravimetric TDS concentrations were assumed for the supply wells. Wells No. 8, 13 and 15 were not used in these scenarios, and the use of Well No. 20 was limited as these have been identified as high-TDS wells in Section 2.2. An annual demand growth of 2% was assumed.

Table 2.5
Projected Average Water Supply TDS
Black Forest Wells Phase 1 and Phase 2 (2016 – 2019)

Year	Projected Annual Demand (AFY)	Projected Avg. Supply TDS (mg/L)	Denver Basin Percent Used (%)
2016	4,013	253	3%
2017	4,091	255	3%
2018	4,170	251	6%
2019	4,249	250	8%

As additional Phase 1 and Phase 2 Black Forest Denver Basin wells come online, the resulting supply TDS is predicted to decrease, consistent with the results of Figure 2.4.

2.5 WATER SOFTENER MORATORIUM

In 2015, CMD has focused staff efforts on data collection and customer education throughout the district concerning the moratorium. This ongoing program includes door-to-door and telephone outreach in order to gain information on customer awareness of the moratorium, whether or not the customer had or was using a softener and if or when an existing softener was bypassed.

The CMD Board of Directors took action at their regular November 2014 meeting to prohibit residential water softeners, passing Resolution 14-06 to prohibit water softeners within the district.⁷ This resolution is attached in the Appendix.

Water softeners are used to remove hardness (calcium and magnesium) from water through a process of ion exchange which increases TDS concentrations that go to the WRF. CMD's drinking water is classified as 'Moderately Hard' based on a typical hardness of 100 mg/L.

During outreach efforts, customers are provided with background information regarding the moratorium and TDS as well as information regarding CMD's current efforts. Interested customers are directed towards the following resources.

1. CMD website, which includes a TDS tab on the main page that expands to references to information included but not limited to:
 - a. Water softener moratorium
 - b. Feasibility Study
 - c. Implementation Plan
 - d. Upper Black Squirrel Creek Basin Assessments
 - e. Other supporting documents
2. TDS and water softener data collected by CMD

⁷ Resolution 14-06 – Resolution Prohibition of Water Softeners Within the Cherokee Metro District and Any Sewer Connected System. November 10, 2014. Cherokee Metropolitan District.

3. Personal home or office visits to further discuss issues or questions regarding the moratorium

As of March 27, 2016, more than 350 calls have been made to customers with a contacted rate of approximately 34 percent. Of those contacted, 14 percent were aware of the water softener moratorium. 12 out of 122 customers indicated that they own a water softener. Of the 12 existing water softeners identified, six have been bypassed and are no longer in use. The apparent percentage of residential accounts with water softeners in use is significantly lower than the value of 60 percent reported in the *Assessment of Impacts and Mitigations of Self-Regenerating Water Softeners on Total Dissolved Solids Concentrations*.⁸

Limiting the number of softeners through increased customer education results in a decrease in the associated contribution of TDS to the water system. Although it appears that a low percentage of CMD's residential customers use water softeners, CMD plans to continue its customer outreach program.

2.6 EXPANSION OF AGRICULTURAL REUSE

In 2015, CMD continued to provide reuse water to its current customer. CMD is in the process of evaluating their Replacement Plan application before the Ground Water Commission (Case No. 08GW71) and determining how to proceed after a recent resolution by the Colorado Supreme Court's (Case No. 13SA330) regarding CMD's ability to claim replacement credits for return flows from Wells No. 14-17. The Replacement Plan will affect CMD's ability to reuse return flows from the water rights, and thus affect the provision of reclaimed water for agricultural reuse past 2016 or any expansion of any reuse program. CMD staff has prepared the '2015 Annual Report' for Regulation #84, which includes an irrigation monthly report summary for water quality and gallons applied by user from March through November 2015.⁹ CMD has not expanded the number of agricultural reuse users. Expanding the use of reclaimed water for agricultural use was identified in the Implementation Plan as an option to reduce the TDS loading to the RIBs. CMD will continue to implement its reuse program based on the results of the pending Replacement Plan.

⁸ *Cherokee Metropolitan District Water Reclamation Facility Assessment of Impacts and Mitigations of Self-Regenerating Water Softeners on Total Dissolved Solids Concentrations*. Revised June 2013. Prepared by Nolte Associates, Inc.

⁹ '2015 Annual Report' *Cherokee Metropolitan District Distribution of Reclaimed Water for Regulation #84*. March 2015. Prepared by Cherokee Metropolitan District.

CHAPTER 3

CONCLUSION

CHAPTER 3 CONCLUSION

TDS levels in the WRF effluent depend upon a complex interaction of water supply sources, customer addition of TDS, service to other connectors and districts, management practices, and treatment scenarios. As outlined in the April 17, 2015 Implementation Plan, CMD is currently employing source control activities to address elevated TDS levels. This section provides summary of the current progress of source control actions taken and future actions identified by CMD.

3.1 CURRENT PROGRESS

The source control activities discussed in this report are ongoing efforts. CMD is committed to achieving the source control goals listed in the Implementation Plan in an effort to reduce WRF effluent TDS levels in the WRF effluent. The following summary of actions taken describes CMD's progress on these tasks.

- The reduction in use of high-TDS wells requires a continuous balance of well supplies based on TDS concentrations while incorporating additional factors. Emphasis has been placed on specifically reducing the use of Well No. 13, a high-TDS and high-production well, in late 2015. CMD is continuing to refine its system of balancing well production to reduce water supply TDS.
- Two new, low-TDS supply wells have come online in the Black Forest Sundance area. The Sundance Dawson Well Augmentation Plan is ongoing due to a lack of information and plan approval. Evaluation of the Black Forest, Phase 2 Wells at Shiloh Ranch and County Line Estates is also in preliminary planning stages. As new, lower TDS wells come online, CMD will have more flexibility to reduce water supply TDS.
- Estimated water supply TDS concentrations have and will continue to decrease due to the inclusion of the Black Forest Phase 1 and 2 wells and reduction of existing high-TDS wells. This reduction correlates with WRF effluent TDS concentrations.
- CMD has reviewed BMPs implemented by industrial dischargers to determine effectiveness and improve existing operations. The goal of this program is to reduce TDS concentrations in industrial discharge.
- A water softener moratorium was enacted in late 2014 to reduce TDS contributions from individual customers. CMD has implemented an ongoing outreach program to identify the number of existing softeners and promote awareness of the moratorium and education about its purpose. Although it appears that water softeners are not commonly used by CMD customers, TDS contributions from the water softeners are expected to decrease as CMD continues to implement the softener moratorium.
- CMD continues to provide reclaimed water for irrigation use to reduce TDS loading to the RIBs during irrigation months. Expansion of this use is currently in question due to

the pending Replacement Plan, which creates uncertainty regarding the provision of this water past 2016.

3.2 FUTURE ACTIONS

In 2015, CMD has made tangible efforts to achieve the defined source control goals and much of this work is ongoing. Moving forward, CMD will continue to address source control goals in the following ways.

- Continue to balance well production based on a variety of factors including TDS concentrations.
- Continue to review and improve existing industrial discharger BMPs.
- Coordinate the inclusion and increased use of the Black Forest Phase 1 wells.
- Proceed with the evaluation of Black Forest, Phase 2 Wells at Shiloh Ranch and County Line Estates and obtain approval for the Dawson Well Augmentation Plan.
- Continue to educate the public about the water softener moratorium and gather data about water softener use by customers.
- Address the pending Replacement Plan in regards to the continued provision of reclaimed water for irrigation use.

APPENDIX

**Compliance Order on
Consent: MC-140514-1**

STATE OF COLORADO

John W. Hickenlooper, Governor
Larry Wolk, MD, MSPH
Executive Director and Chief Medical Officer

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr. S.
Denver, Colorado 80246-1530
Phone (303) 692-2000
Located in Glendale, Colorado
www.colorado.gov/cdphe



Colorado Department
of Public Health
and Environment

May 14, 2014

Cherokee Metropolitan District
Attention: Sean Chambers, General Manager
6250 Palmer Park Boulevard
Colorado Springs, Colorado 80915

Certified Mail Number: 7007 0220 0001 0163 1114

RE: Compliance Order on Consent, Number: MC-140514-1

Dear Mr. Chambers:

Enclosed for Cherokee Metropolitan District's records, you will find Cherokee's copy, with original signatures, of the recently executed Compliance Order on Consent. Please remember that this agreement is subject to a thirty-day public comment period (paragraph 50). Upon initiation, if the Division receives any comments during this period we will contact your office to discuss. Also, please be advised that the first page of the Order and the first page of each SEP proposal/agreement form were changed to place the assigned Order Number on the final document.

If you have any questions, please don't hesitate to contact me at (303) 692-3598 or by electronic mail at michael.harris@state.co.us.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael Harris".

Michael Harris, Manager
Clean Water Compliance & Enforcement Unit
WATER QUALITY CONTROL DIVISION

Enclosure(s)

cc: Natasha Davis, EPA Region VIII
El Paso County Department of Health & Environment
Nicole Rowan, Watershed Section, CDPHE
Michael Beck, Grants and Loans Unit, CDPHE
Doug Camrud, Engineering Section, CDPHE
Heather Drissel, Field Services Section, CDPHE
Lillian Gonzalez, Permits Section, CDPHE
Tania Watson, Data Management, CDPHE
Barry Cress, DOLA



COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
DIVISION OF ADMINISTRATION
WATER QUALITY CONTROL DIVISION

COMPLIANCE ORDER ON CONSENT

NUMBER: MC-140514-1

IN THE MATTER OF: **CHEROKEE METROPOLITAN DISTRICT**
CDPS PERMIT NO. COX-048348
EL PASO COUNTY, COLORADO

The Colorado Department of Public Health and Environment ("Department"), through the Water Quality Control Division ("Division"), issues this Compliance Order on Consent ("Consent Order"), pursuant to the Division's authority under §§25-8-602 and 605, C.R.S. of the Colorado Water Quality Control Act ("the Act") §§25-8-101 to 803, C.R.S., and its implementing regulations, with the express consent of Cherokee Metropolitan District ("Cherokee"). The Division and Cherokee may be referred to collectively as "the Parties."

STATEMENT OF PURPOSE

1. The mutual objectives of the Parties in entering into this Consent Order are:
 - a. To establish compliance requirements and criteria for the continued operation of Cherokee's Wastewater Reclamation Facility located at or near 19174 Drennan Road, El Paso County, Colorado Springs, Colorado (the "Facility"); and
 - b. To resolve, without litigation, the alleged violations of the Act cited herein by the Division, and the associated civil penalties.

DIVISION'S FINDINGS OF FACT AND DETERMINATION OF ALLEGED VIOLATIONS

2. Based upon the Division's investigation into and review of the compliance issues identified herein, and in accordance with §§25-8-602 and 605, C.R.S., the Division has made the following determinations regarding Cherokee, the Facility and Cherokee's compliance with the Act and its Colorado Discharge Permit System ("CDPS") permit.

3. At all times relevant to the alleged violations cited herein, Cherokee was a "Special District" formed in El Paso County, Colorado pursuant to the Colorado Special District Act, §§32-1-101 et seq and 32-4-501 et seq, C.R.S.
4. Cherokee is a "person" as defined by §25-8-103(13), C.R.S. and its implementing permit regulation, 5 CCR 1002-61, §61.2(73).
5. The Facility receives and treats approximately 1.59 million gallons per day of domestic sewage generated from the Cimarron Hills area of Colorado Springs, El Paso County, Colorado and from two (2) contract customers: Meridian Service Metropolitan District and Schriever Air Force Base.
6. The Facility consists of a mechanical treatment plant that includes an extended aeration activated sludge biological process, utilizing four sequencing batch reactors for carbon oxidation, nitrification and denitrification, followed by effluent flow equalization, and ultraviolet disinfection. Waste activated sludge is aerobically digested and dewatered utilizing centrifuges. Treated effluent from the Facility is conveyed to a rapid infiltration basin system, approximately four (4) miles east-southeast, and consisting of ten (10) individual infiltration basins.
7. On August 21, 2009, Cherokee applied for coverage under a CDPS individual ground water discharge permit for Discharges to Ground Water from Domestic Wastewater Treatment Works (the "Permit").
8. On May 13, 2010, the Division issued Cherokee Individual Permit Number COX-048348 authorizing Cherokee to discharge effluent wastewater from the Facility to groundwater under the terms and conditions of the Permit. The Permit became effective on June 12, 2010 and is due to expire May 31, 2015.
9. Cherokee commenced operations at the Facility in June 2010 and has continuously operated since that date.
10. The Permit specifies that Cherokee is authorized to discharge effluent wastewater from the Facility to groundwater (Upper Black Squirrel Alluvial Aquifer). No other discharges are authorized by the Permit. The discharge is subject to the specific effluent limitations and other conditions of the Permit.
11. Groundwater is "state waters" as defined by §25-8-103(19), C.R.S. and its implementing permit regulation, 5 CCR 1002-61, §61.2 (101).
12. Section 61.8, 5 CCR 1002-61, states in part that "A permittee must comply with all the terms and conditions of the permit."

Failure to Comply with Permit Effluent Limitations

13. Pursuant to Part I.A.1 of the Permit, the discharge from the Facility at outfalls 001A, 050C(L), and 050D(L) should not have exceeded, among other parameters and limitations not listed herein, the effluent limitations specified below:

Point of Compliance	Effluent Parameters	Discharge Limitations			
		30-Day Average	7-Day Average	Monthly Minimum	Daily Maximum
Outfall 001A	5-Day Biochemical Oxygen Demand ("BOD ₅ ") (mg/L)	30 mg/L	45 mg/L	-	-
Outfall 001A	BOD ₅ Removal (%)	-	-	85%	-
Outfall 001A	Total Suspended Solids ("TSS") (mg/L)	30 mg/L	45 mg/L	-	-
Outfall 001A	TSS Removal (%)	-	-	85%	-
Outfall 001A	Total Inorganic Nitrogen ("TIN") (mg/L)	-	-	-	10 mg/L
Outfalls 050C(L) and 050D(L)	Total Dissolved Solids ("TDS") (mg/L)	400 mg/L	-	-	-

Each point of compliance shown in the above table is as directed in CDPS Permit No. COX-048348 effective June 12, 2010:

- a) Outfall 001A = The Facility's outfall following ultraviolet radiation disinfection and prior to the effluent being conveyed by pipeline to the rapid infiltration basins and mixing with the receiving water.
 - b) Outfalls 050C(L) and 050D(L) = Downgradient monitoring wells located within fifteen (15) feet of the southern (downgradient) boundary of the Facility's property where the rapid infiltration basins are located.
14. Pursuant to Part I.D.1 of the Permit, to provide an indication of the quality of the wastewater being discharged into the Upper Black Squirrel Alluvial Aquifer, Cherokee collects specific samples of the effluent at the monitoring locations specified in the Permit. The analytical results of the samples are summarized and reported to the Division via monthly Discharge Monitoring Reports ("DMRs") which include a certification by Cherokee affirming that the information provided therein is true, accurate and complete, to the knowledge and belief of Cherokee.
15. Cherokee's DMRs submitted to the Division include, among other information and data, the effluent concentration summary data for BOD₅, BOD₅ Removal, TSS, TSS Removal, TIN, and TDS which

exceeded the effluent limitations imposed by Part I.A.1 of the Permit. These effluent violations are attached as Exhibit A.

16. BOD₅, BOD₅ Removal, TSS, TSS Removal, TIN, and TDS are each a "pollutant" (or indicator thereof) as defined by §25-8-103(15), C.R.S. and its implementing permit regulation, 5 CCR 1002-61, §61.2 (76).
17. The Permit did not authorize the pollutant discharge levels identified above in paragraph 15 and in Exhibit A and Cherokee does not have any other permits authorizing such discharge into State Waters.
18. Cherokee's failure to comply with the effluent limitations set forth in the Permit and identified above in paragraph 15 and Exhibit A constitutes alleged violations of Part I.A.1 of the Permit.

Cherokee's Position on Alleged Violations

19. Cherokee submitted a request for preliminary effluent limitations ("PELs") for the proposed discharge of the Facility to groundwater through rapid infiltration basins on May 2, 2006. The Division responded with a letter dated June 15, 2006 stating the PELs which would apply to that discharge to groundwater. The PELs presented by the Division in the June 15, 2006 letter did not include TDS as an effluent limit for this discharge. Cherokee accomplished the design and preparation of construction documents in accordance with the PELs set forth in the June 15, 2006 letter. The subsequent site location approval and construction documents approval by the Division for the Facility did not include any statements regarding a requirement for meeting a TDS effluent limit. TDS was presented by the Division as an effluent limit parameter in a draft discharge permit following Cherokee's application for a discharge permit on August 14, 2009. Even though the Facility was not designed or constructed to remove or otherwise control TDS in the effluent, the Division issued a draft permit for public review on March 19, 2010, and a final permit effective June 12, 2010, containing effluent limits for TDS.
20. In response to the TIN discharge permit violations occurring in early 2011, Cherokee's initial investigations indicated that the anoxic treatment periods may not have been long enough and the process may be carbon deficient. Cherokee implemented process changes to increase the anoxic treatment periods and experimented with feeding supplemental carbon, in the form of methanol, during the anoxic periods. These process modifications initially showed positive results, with the effluent TIN concentration steadily dropping from 34.0 mg/L in March 2011 to 11.8 mg/L in June 2011. Cherokee was in the process of installing equipment that would allow methanol to be fed on a more consistent basis to improve the performance of the denitrification process in June 2011 when the Division informed Cherokee that adding methanol would likely be a change in the treatment process and therefore require an amendment to the site location approval and design, plan and specification review and approval by the Division. Cherokee advocated the immediate implementation of a methanol feed and expressed its concern to the Division that the effluent would not be in compliance with the TIN limitation until process modifications could be implemented. Cherokee's *Pilot/Full Scale Demonstration Project – Methanol Addition as a Carbon Source* was authorized by the Division on May 24, 2012 and Cherokee commenced operation of the demonstration project on June 15, 2012. If a mechanism was in place that allowed the Division to immediately authorize the implementation of Cherokee's methanol feed in early July 2011, the TIN limitation exceedances that occurred from July 2011 through June 2012 might have been avoided.

21. The Division finds that Cherokee's position statement, including the additional statements documented in CMD's January 17, 2014 letter to the Division, are not entirely consistent with the information gathered in the course of the Division's inspections and investigation of the incidents described herein and the inclusion of Cherokee's position statement in this order should not be construed to constitute any admission or agreement by the Division as to the content of the position statement.

ORDER AND AGREEMENT

22. Based on the foregoing factual and legal determinations, pursuant to its authority under §§25-8-602 and 605, C.R.S., and in satisfaction of the alleged violations cited herein, the Division orders Cherokee to comply with all provisions of this Consent Order, including all requirements set forth below.
23. Cherokee agrees to the terms and conditions of this Consent Order. Cherokee agrees that this Consent Order constitutes a notice of alleged violation and an order issued pursuant to §§25-8-602 and 605, C.R.S., and is an enforceable requirement of the Act. Cherokee also agrees not to challenge directly or collaterally, in any judicial or administrative proceeding brought by the Division or by Cherokee against the Division:
- a. The issuance of this Consent Order;
 - b. The factual and legal determinations made by the Division herein; and
 - c. The Division's authority to bring, or the court's jurisdiction to hear, any action to enforce the terms of this Consent Order under the Act.
24. Notwithstanding the above, Cherokee does not admit to any of the factual or legal determinations made by the Division herein, and any action undertaken by Cherokee pursuant to this Consent Order shall not constitute evidence of fault and liability by Cherokee with respect to the conditions of the Facility.

Compliance Actions and Requirements

25. Cherokee shall immediately implement measures to attain compliance with the Colorado Water Quality Control Act and the terms and conditions of the Permit.

Schedule to Meet Total Inorganic Nitrogen Effluent Limit

26. Cherokee implemented a *Pilot/Full Scale Demonstration Project-Methanol Addition as a Carbon Source* ("Demonstration Project"), as initially authorized by the Division on May 24, 2012 with a subsequent authorization for an extension to December 31, 2013. The full-scale Demonstration Project was intended to provide for the addition of supplemental carbon to improve the denitrification process, modify the manner in which air delivery to the pre-react basin is accomplished to enhance anoxic conditions and provide for internal recycle in the aeration basin to the pre-react zone. Cherokee submitted a request to the Division to continue the Demonstration Project past December 31, 2013 to September 30, 2014. On November 26, 2013, the Division extended authorization to operate the Demonstration Project to May 24, 2014, which is two years after the initial authorization to operate the Demonstration Project.

27. On July 17, 2013, Cherokee submitted an Application for Amendment of an Existing Site Location Approval to incorporate modifications to the activated sludge system to enhance and improve performance of the denitrification process. The Division approved the Application for Amendment on September 27, 2013. The Amendment authorized Cherokee to proceed with implementation of permanent improvements for application of methanol as a supplemental carbon source to enhance the denitrification process at the Facility.
28. In accordance with the Division's WPC Policy DR-1, Cherokee submitted a Process Design Report ("PDR") to the Division on November 26, 2013, addressing the permanent improvements to the Facility to facilitate the addition of methanol as a supplemental carbon source. By April 30, 2014, Cherokee shall submit a certification of the design and construction documents (plans and specifications) in accordance with the "streamlined design review process" specified by Water Quality Control Commission ("WQCC") Regulation No. 22.
29. Upon receipt and acceptance of the certification of design and construction documents submitted by Cherokee for the Facility improvements to add supplemental carbon referenced in Paragraph 28, the Division will provide Cherokee authorization to continue the Demonstration Project until August 31, 2014 during which time Cherokee will implement the permanent improvements to the Facility.
30. Within sixty (60) days of the Division's approval of the PDR and the plans and specifications for the new preliminary treatment facility, Cherokee shall initiate construction of the new preliminary treatment facility. Cherokee shall submit quarterly progress reports to the Division outlining the progress of the preliminary treatment facility construction. At a minimum, each report shall outline activities undertaken in the current reporting period and planned activities for the next three (3) months to remain in compliance with this Consent Order.

Schedule to Meet Total Dissolved Solids Effluent Limit

31. Within thirty (30) days of the effective date of this Consent Order, Cherokee shall commence a technical assessment of the suitability and effectiveness of accomplishing Total Dissolved Solids ("TDS") removal in its source water supply as a means of controlling TDS discharge from the Facility. This will include blending with new source water supplies presently being developed and source water treatment. The assessment of alternative approaches for TDS control will also include evaluation of TDS control at the Facility's biological process discharge. Additionally, Cherokee shall prepare a summary report of the findings of the assessment of the suitability and effectiveness of accomplishing TDS removal in its source water supply and submit this report to the Division.
32. Within one hundred eighty (180) days of the effective date of this Consent Order, Cherokee shall complete the assessment of technically feasible approaches to control TDS in the Facility's effluent, as required by Paragraph 31 of this Consent Order addressing financial and cost-benefit impacts, operational impacts with particular attention to the requirements for management of residuals from the TDS control processes, legal issues and impacts from conditions of well permits, decrees and other water resource management and use agreements, water use efficiency, institutional constraints and other identified issues which will influence the selection of a TDS control strategy for implementation. Additionally, Cherokee shall prepare a summary report of the findings of the assessment described in this paragraph and submit to the Division.

33. Within two hundred ten (210) calendar days of the effective date of this Consent Order, Cherokee shall submit to the Division an implementation plan for a selected TDS control strategy, as addressed in Paragraphs 31 and 32. The submitted plan shall become a condition of this Consent Order and Cherokee shall comply with the plan as submitted unless notified by the Division, in writing within sixty (60) calendar days of the submittal, that modifications or an alternate plan or program is appropriate. If the Division imposes modifications or an alternate plan or program, it shall also become a condition of this Consent Order.
34. Within sixty (60) days of the effective date of this Consent Order, Cherokee shall submit a summary report of the review and an update of the dynamic groundwater model of the Black Squirrel Creek alluvial aquifer in the vicinity of the rapid infiltration basins to which the Facility discharges. Cherokee shall analyze the variation in the groundwater phreatic surface as a result of application of treated wastewater in the rapid infiltration basins and pumping of production wells upstream and downstream, and laterally from the rapid infiltration basins.
35. Within thirty (30) days of the effective date of this Consent Order, Cherokee shall complete development of a customer education program expressed as Best Management Practices to maximize the efficiency of home water softeners for purposes of minimizing wastewater generated from the ion exchange resin regeneration process. The primary means of education will be through Cherokee's customer newsletter. Outreach and educational tools shall also be developed for implementation of Best Management Practices for TDS control in nonresidential wastewater contributions. Cherokee shall publish the consumer education program in the customer newsletter no less than semi-annually.
36. Within forty-five (45) days of the effective date of this Consent Order, Cherokee shall develop design and construction documents for new groundwater monitoring wells at or near Cherokee's property boundary and submit to the Division for approval. Within one hundred twenty (120) days following Division approval of the new groundwater monitoring well location's design and construction documents, Cherokee shall complete construction of the modified groundwater monitoring system.
37. Within one hundred eighty (180) days of the effective date of this Consent Order, Cherokee shall complete an assessment of the local limits in its pretreatment program addressing TDS and other constituents of concern in accordance with USEPA Region 8 guidance for development of local limits. Additionally, within two hundred ten (210) days of the effective date of this Consent Order, Cherokee shall prepare a summary report of the findings of the assessment and submit to the Division.
38. All documents submitted under this Consent Order shall use the same titles as stated in this Consent Order, and shall reference both the number of this Consent Order and the number of the paragraph pursuant to which the document is required. No plan submitted for Division approval under this Consent Order may be implemented unless and until written approval is received from the Division except as otherwise specified or provided herein. Any approval by the Division of a plan submitted under this Consent Order is effective upon receipt by Cherokee. All approved plans, including all procedures and schedules contained in the plans, are hereby incorporated into this Consent Order, and shall constitute enforceable requirements under the Act.

CIVIL PENALTY AND SUPPLEMENTAL ENVIRONMENTAL PROJECTS

39. Based upon the application of the Division's Civil Penalty Policy (May 1, 1993), and consistent with Departmental policies for violations of the Act, the Division has determined that a penalty of Sixty Three Thousand Seven Hundred Twenty Dollars (\$63,720.00) is appropriate for the violations cited herein.
40. Through the application of the criteria set forth in the Colorado Department of Public Health and Environment's Final Agency-Wide Policy on Settling Administrative and/or Civil Penalties Against Eligible Governmental Entities, the Division has determined the entire penalty can be mitigated through the completion of the following Supplemental Environmental Projects ("SEPs") identified by Cherokee and which are valued at Sixty Nine Thousand Seven Hundred Seventy Five Dollars (\$69,775.00).
41. Cherokee shall undertake the following SEPs, which the Parties agree are intended to secure significant environmental or public health protection and improvements.
42. Cherokee shall spend no less than Sixty Nine Thousand Seven Hundred Seventy Five Dollars (\$69,775.00) on the implementation and completion of energy efficiency/pollution prevention upgrades within the Cherokee service area in El Paso County. The combination of the first and third party SEPs are further described in Exhibit B. If Cherokee completes the energy efficiency/pollution prevention upgrades specified in Exhibit B and does not expend the full Sixty Nine Thousand Seven Hundred Seventy Five Dollars (\$69,775.00), Cherokee may propose an alternate SEP for Division review and approval that accounts for the remaining balance. The alternate SEP proposal shall be submitted to the Division by December 1, 2014.
43. Cherokee shall not deduct the expenses associated with the implementation of the above-described SEPs for any tax purpose or otherwise obtain any favorable tax treatment of such payment or project.
44. Cherokee hereby certifies that, as of the date of this Consent Order, it is not under any existing legal obligation to perform or develop the SEPs. Cherokee further certifies that it has not received, and will not receive, credit in any other enforcement action for the SEPs. In the event that Cherokee has, or will receive credit under any other legal obligation for the SEPs, Cherokee shall pay Sixty Three Thousand Seven Hundred Twenty Dollars (\$63,720.00) to the Division as a civil penalty within thirty (30) calendar days of receipt of a demand for payment by the Division. Method of payment shall be by certified or cashier's check drawn to the order of the "Colorado Department of Public Health and Environment," and delivered to:

Michael Harris
Colorado Department of Public Health and Environment
Water Quality Control Division
Mail Code: WQCD-CWE-B2
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

45. The SEPs must be completed to the satisfaction of the Division by November 30, 2014, and must be operated for the useful life of the SEPs. In the event that Cherokee fails to comply with any of the terms or provisions of this Consent Order relating to the performance of the SEPs, Cherokee shall be liable for penalties as follows:
 - a. Payment of a penalty in the amount of Sixty Three Thousand Seven Hundred Twenty Dollars (\$63,720.00). The Division, in its sole discretion, may elect to reduce this penalty for environmental benefits created by the partial performance of the SEPs.
 - b. Cherokee shall pay this penalty within thirty (30) calendar days of receipt of written demand by the Division. Method of payment shall be as specified in paragraph 44 above.
46. Cherokee shall submit SEP Completion Reports for each SEP to the Division by December 30, 2014. The SEP Completion Reports shall contain the following information:
 - a. A detailed description of the SEPs as implemented;
 - b. A description of any operating problems encountered and the solutions thereto;
 - c. Itemized costs, documented by copies of purchase orders and receipts or canceled checks or other forms of proof of payment;
 - d. Certification that the SEPs have been fully implemented pursuant to the provisions of this Consent Order; and
 - e. A description of the environmental and public health benefits resulting from implementation of the SEPs (with quantification of the benefits and pollutant reductions, if feasible).
47. Failure to submit the SEP Completion Reports with the required information, or any periodic report, shall be deemed a violation of this Consent Order.
48. Cherokee shall include the following language in any public statement, oral or written, making reference to the SEPs: "This project was undertaken in connection with the settlement of an enforcement action taken by the Colorado Department of Public Health and Environment for alleged violations of the Colorado Water Quality Control Act."

SCOPE AND EFFECT OF CONSENT ORDER

49. The Parties agree and acknowledge that this Consent Order constitutes a full and final settlement of the alleged violations cited herein.
50. This Consent Order is subject to the Division's "Public Notification of Administrative Enforcement Actions Policy," which includes a thirty-day public comment period. The Division and Cherokee each reserve the right to withdraw consent to this Consent Order if comments received during the thirty-day period result in any proposed modification to the Consent Order.
51. This Consent Order constitutes a final agency action upon a determination by the Division following the public comment period. Any violation of the provisions of this Consent Order by Cherokee, including any false certifications, shall be a violation of a final order or action of the Division for the

purpose of §25-8-608, C.R.S., and may result in the assessment of civil penalties of up to ten thousand dollars per day for each day during which such violation occurs.

52. The Parties' obligations under this Consent Order are limited to the matters expressly stated herein or in approved submissions required hereunder. All submissions made pursuant to this Consent Order are incorporated into this Consent Order and become enforceable under the terms of this Consent Order as of the date of approval by the Division.
53. The Division's approval of any submission, standard, or action under this Consent Order shall not constitute a defense to, or an excuse for, any prior violation of the Act, or any subsequent violation of any requirement of this Consent Order or the Act.
54. Notwithstanding paragraph 24 above, the alleged violations described in this Consent Order will constitute part of Cherokee's compliance history for purposes where such history is relevant. This includes considering the alleged violations described above in assessing a penalty for any subsequent violations against Cherokee. Cherokee agrees not to challenge the use of the cited alleged violations for any such purpose.
55. This Consent Order does not relieve Cherokee from complying with all applicable Federal, State, and/or local laws in fulfillment of its obligations hereunder and shall obtain all necessary approvals and/or permits to conduct the activities required by this Consent Order. The Division makes no representation with respect to approvals and/or permits required by Federal, State, or local laws other than those specifically referred to herein.

LIMITATIONS, RELEASES AND RESERVATION OF RIGHTS AND LIABILITY

56. Upon the effective date of this Consent Order, and during its term, this Consent Order shall stand in lieu of any other enforcement action by the Division with respect to the specific instances of alleged violations cited herein. The Division reserves the right to bring any action to enforce this Consent Order, including actions for penalties or the collection thereof, and/or injunctive relief.
57. This Consent Order does not grant any release of liability for any violations not specifically cited herein.
58. Nothing in this Consent Order shall preclude the Division from imposing additional requirements in the event that new information is discovered that indicates such requirements are necessary to protect human health or the environment.
59. Upon the effective date of this Consent Order, Cherokee releases and covenants not to sue the State of Colorado or its employees, agents or representatives as to all common law or statutory claims or counterclaims arising from, or relating to, the alleged violations of the Act specifically addressed herein.
60. Cherokee shall not seek to hold the State of Colorado or its employees, agents or representatives liable for any injuries or damages to persons or property resulting from acts or omissions of Cherokee, or those acting for or on behalf of Cherokee, including its officers, employees, agents, successors, representatives, contractors, consultants or attorneys in carrying out activities pursuant to

this Consent Order. Cherokee shall not hold out the State of Colorado or its employees, agents or representatives as a party to any contract entered into by Cherokee in carrying out activities pursuant to this Consent Order. Nothing in this Consent Order shall constitute an express or implied waiver of immunity otherwise applicable to the State of Colorado, its employees, agents or representatives.

OFFSITE ACCESS

61. To the extent any plan submitted by Cherokee requires access to property not owned or controlled by Cherokee, Cherokee shall use its best efforts to obtain site access from the present owners of such property to conduct required activities and to allow Division access to such property to oversee such activities. In the event that site access is not obtained when necessary, Cherokee shall notify the Division in writing regarding its best efforts and its failure to obtain such access.

SITE ACCESS AND SAMPLING

62. The Division shall be authorized to oversee any and all work being performed under this Consent Order. The Division shall be authorized access to the Facility property at any time work is being conducted pursuant to this Consent Order, and during reasonable business hours during any period work is not being conducted, for the purposes of determining Cherokee's compliance with the Act, the Regulations, and this Consent Order. The Division shall be authorized to inspect work sites, operating and field logs, contracts, purchasing/shipping records, and other relevant records and documents relating to this Consent Order or any requirement under this Consent Order and to interview Cherokee personnel and contractors performing work required by this Consent Order. Nothing in this paragraph limits or impairs the Division's statutory authorities to enter and inspect the Facility.
63. The Division may conduct any tests necessary to ensure compliance with this Consent Order and to verify the data submitted by Cherokee. Cherokee shall notify the Division in writing of any sampling activities undertaken pursuant to any plan or requirement of this Consent Order a minimum of seventy-two (72) hours prior to the sampling being conducted, and shall provide split samples to the Division upon request.
64. Cherokee shall notify the Division in writing of any excavation, construction (including the construction of monitoring wells) or other investigatory or remedial activities undertaken pursuant to any plan or requirement of this Consent Order a minimum of seventy-two (72) hours prior to beginning the excavation, construction, or required activity. Cherokee shall provide the Division any blue print, diagram, construction or other permits for any construction activity undertaken pursuant to this Consent Order upon request.

FORCE MAJEURE

65. Cherokee shall perform the requirements of this Consent Order within the schedules and time limits set forth herein and in any approved plan unless the performance is prevented or delayed by events that constitute a force majeure. A force majeure is defined as any event arising from causes which are not reasonably foreseeable, which are beyond the control of Cherokee, and which cannot be overcome by due diligence.

66. Within seventy-two (72) hours of the time that Cherokee knows or has reason to know of the occurrence of any event which Cherokee has reason to believe may prevent Cherokee from timely compliance with any requirement under this Consent Order; Cherokee shall provide verbal notification to the Division. Within seven (7) calendar days of the time that Cherokee knows or has reason to know of the occurrence of such event, Cherokee shall submit to the Division a written description of the event causing the delay, the reasons for and the expected duration of the delay, and actions which will be taken to mitigate the duration of the delay.
67. The burden of proving that any delay was caused by a force majeure shall at all times rest with Cherokee. If the Division agrees that a force majeure has occurred, the Division will so notify Cherokee. The Division will also approve or disapprove of Cherokee's proposed actions for mitigating the delay. If the Division does not agree that a force majeure has occurred, or if the Division disapproves of Cherokee's proposed actions for mitigating the delay, it shall provide a written explanation of its determination to Cherokee. Pursuant to the Dispute Resolution section, within fifteen (15) calendar days of receipt of the explanation, Cherokee may file an objection.
68. Delay in the achievement of one requirement shall not necessarily justify or excuse delay in the achievement of subsequent requirements. In the event any performance under this Consent Order is found to have been delayed by a force majeure, Cherokee shall perform the requirements of this Consent Order that were delayed by the force majeure with all due diligence.

DISPUTE RESOLUTION

69. If the Division determines that a violation of this Consent Order has occurred, that a force majeure has not occurred; that the actions taken by Cherokee to mitigate the delay caused by a force majeure are inadequate; that Cherokee's Notice of Completion should be rejected pursuant to paragraph 75, or that the Cherokee's SEP Completion Report submitted pursuant to paragraph 46 is deficient, the Division shall provide a written explanation of its determination to Cherokee. Within fifteen (15) calendar days of receipt of the Division's determination, Cherokee shall:
 - a. Submit a notice of acceptance of the determination; or
 - b. Submit a notice of dispute of the determination.If Cherokee fails to submit either of the above notices within the specified time, it will be deemed to have accepted the Division's determination.
70. If the Division disapproves or approves with modifications any original or revised plan submitted by Cherokee pursuant to this Consent Order, the Division shall provide a written explanation of the disapproval or approval with modifications. Within fifteen (15) calendar days of receipt of the Division's approval with modifications or disapproval of the plan, Cherokee shall:
 - a. In the case of an approval with modifications only, submit a notice of acceptance of the plan as modified and begin to implement the modified plan;

- b. In the case of disapproval only, submit a revised plan for Division review and approval. Cherokee may not select this option if the Division has included in its disapproval an alternate plan that shall be implemented by Cherokee; or
- c. Submit a notice of dispute of the disapproval or approval with modifications.

If Cherokee fails to do any of the above within the specified time, Cherokee shall be deemed to have failed to comply with the Consent Order, and the Division may bring an enforcement action, including an assessment of penalties.

71. If Cherokee submits a revised plan, the plan shall respond adequately to each of the issues raised in the Division's written explanation of the disapproval or approval with modifications. The Division may determine that failure to respond adequately to each of the issues raised in the Division's written explanation constitutes a violation of this Consent Order. The Division shall notify Cherokee in writing of its approval, approval with modifications, or disapproval of the revised plan. If the Division disapproves the revised plan, it may include in its disapproval a plan for implementation by Cherokee. Such disapproval and plan shall be deemed effective and subject to appeal in accordance with the Act and the Colorado State Administrative Procedures Act, §§ 24-4-101 through 108, C.R.S. (the "APA"), unless Cherokee submits a notice of dispute, pursuant to paragraph 70 above, of the Division's disapproval and plan for implementation. All requirements and schedules of the Division's plan shall not become effective pending resolution of the dispute.

NOTICES

72. Unless otherwise specified, any report, notice or other communication required under the Consent Order shall be sent to:

For the Division:

Colorado Department of Public Health and Environment
Water Quality Control Division / WQCD-CWE-B2
Attention: Michael Harris
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530
Telephone: 303.692.3598
E-mail: michael.harris@state.co.us

For Cherokee Metropolitan District:

Cherokee Metropolitan District
Attention: Sean Chambers, General Manager
6250 Palmer Park Boulevard
Colorado Springs, Colorado 80915
Telephone: 719.597.5080
E-mail: schambers@cherokeemetro.org

OBLIGATIONS UNAFFECTED BY BANKRUPTCY

73. The obligations set forth herein are based on the Division's police and regulatory authority. These obligations require specific performance by Cherokee of corrective actions carefully designed to prevent on-going or future harm to public health or the environment, or both. Enforcement of these obligations is not stayed by a petition in bankruptcy. Cherokee agrees that the penalties set forth in this Consent Order are not in compensation of actual pecuniary loss. Further, the obligations imposed by this Consent Order are necessary for Cherokee and the Facility to achieve and maintain compliance with State law.

MODIFICATIONS

74. This Consent Order may be modified only upon mutual written agreement of the Parties.

COMPLETION OF REQUIRED ACTIONS

75. Cherokee shall submit a Notice of Completion to the Division upon satisfactory completion of all requirements of this Consent Order. The Division shall either accept or reject Cherokee's Notice of Completion in writing within thirty (30) calendar days of receipt. If the Division rejects Cherokee's Notice of Completion, it shall include in its notice a statement identifying the requirements that the Division considers incomplete or not satisfactorily performed and a schedule for completion. Cherokee shall, within fifteen (15) calendar days of receipt of the Division's rejection, either:

- a. Submit a notice of acceptance of the determination; or
- b. Submit a notice of dispute.

If Cherokee fails to submit either of the above notices within the specified time, it will be deemed to have accepted the Division's determination.

NOTICE OF EFFECTIVE DATE

76. This Consent Order shall be fully effective, enforceable and constitute a final agency action upon notice from the Division following closure of the public comment period referenced in paragraph 50.

BINDING EFFECT AND AUTHORIZATION TO SIGN

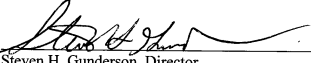
77. This Consent Order is binding upon Cherokee and its officials, employees, agents, representatives, successors in interest, and assigns. The undersigned warrant that they are authorized to legally bind their respective principals to this Consent Order. Cherokee agrees to provide a copy of this Consent Order to any contractors and other agents performing work pursuant to this Consent Order and require such agents to comply with the requirements of this Consent Order. In the event that a party does not sign this Consent Order within thirty (30) calendar days of the other party's signature, this

Consent Order becomes null and void. This Consent Order may be executed in multiple counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same Consent Order.

FOR CHEROKEE METROPOLITAN DISTRICT:

 Date: May 9, 2014
Sean Chambers, General Manager

FOR THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT:

 Date: 5/14/14
Steven H. Gunderson, Director
WATER QUALITY CONTROL DIVISION

High-TDS Supply Wells Production

Month	Flow (MG/month)			
	NO.13	NO.8	NO.15	GOSS
Jan-12	70.93	0.00	0.00	0.00
Feb-12	73.65	0.00	0.00	0.00
Mar-12	84.14	2.58	0.00	0.00
Apr-12	69.43	7.23	0.00	0.00
May-12	82.06	7.90	0.00	0.00
Jun-12	79.69	3.90	0.00	0.00
Jul-12	59.59	8.12	0.00	0.00
Aug-12	71.10	10.93	1.87	0.00
Sep-12	71.02	10.35	19.69	0.00
Oct-12	32.18	2.05	18.86	0.00
Nov-12	10.15	4.65	12.41	0.00
Dec-12	41.50	2.42	17.29	0.00
Jan-13	75.54	0.00	17.24	0.00
Feb-13	68.58	0.00	16.35	0.00
Mar-13	60.60	0.00	19.55	0.00
Apr-13	66.04	0.00	17.87	0.00
May-13	82.33	0.06	15.09	0.00
Jun-13	59.25	0.92	19.32	0.00
Jul-13	51.61	4.07	15.36	0.00
Aug-13	8.08	8.14	1.33	0.00
Sep-13	21.89	3.64	0.00	0.00
Oct-13	15.41	0.00	0.00	0.00
Nov-13	0.00	0.00	0.00	0.00
Dec-13	0.00	0.00	0.00	0.00
Jan-14	43.04	0.00	0.00	0.00
Feb-14	50.24	0.00	8.03	0.00
Mar-14	1.83	4.95	18.82	0.00
Apr-14	30.87	9.99	18.98	0.00
May-14	28.18	5.01	18.51	0.00
Jun-14	24.46	9.20	17.10	26.08
Jul-14	34.69	4.58	14.12	41.63
Aug-14	34.69	4.58	14.12	41.63
Sep-14	20.49	14.77	4.18	33.24
Oct-14	33.01	9.49	11.05	28.38
Nov-14	14.64	0.01	5.36	0.04
Dec-14	0.08	0.01	11.79	0.00
Jan-15	18.69	0.01	2.71	17.36
Feb-15	68.56	0.00	0.01	0.00
Mar-15	78.96	0.00	0.00	0.00

Apr-15	59.72	9.38	1.97	9.64
May-15	73.04	33.54	0.00	8.59
Jun-15	82.56	33.30	3.13	8.95
Jul-15	96.81	3.87	15.99	24.33
Aug-15	99.58	29.39	18.94	1.36
Sep-15	97.44	32.80	19.16	28.81
Oct-15	38.63	9.99	14.42	20.35
Nov-15	0.20	0.61	1.78	25.40
Dec-15	0.22	0.03	11.02	11.75
Jan-16	0.49	0.00	15.81	32.57
Feb-16	1.15	0.04	13.63	21.97

**2010-2015 WRF Effluent
and Monitoring Wells
TDS**

Gravimetric Data					
Month	WRF	Upgrad.	Upgrad.	Downgrad.	Downgrad.
	Effluent	Mon. Well	Mon. Well	Mon. Well	Mon. Well
	Comp/Grav.	050-A	050-B	050-C	050-D
		Grab/Grav.	Grab/Grav.	Grab/Grav.	Grab/Grav.
Aug-2010	506	251	186	245	177
Sep-2010	610	284	204	266	192
Oct-2010	672	278	216	762	786
Nov-2010	638	262	212	752	618
Dec-2010	620	258	203	680	672
Jan-2011	651	276	194	624	774
Feb-2011	677	244	178	642	638
Mar-2011	655	290	214	694	692
Apr-2011	625	242	192	664	674
May-2011	731	274	198	653	725
Jun-2011	717	268	206	666	702
Jul-2011	590	308	206	704	734
Aug-2011	594	327	195	637	670
Sep-2011	653	319	233	658	684
Oct-2011	661	299	206	600	746
Nov-2011	715	314	213	645	707
Dec-2011	611	328	237	678	714
Jan-2012	716	334	234	654	692
Feb-2012	737	326	237	671	706
Mar-2012	695	315	194	682	682
Apr-2012	685	308	183	669	656
May-2012	603	325	211	732	669
Jun-2012	621	284	133	656	630
Jul-2012	563	345	167	667	697
Aug-2012	485	262	226	672	605
Sep-2012	608	276	195	654	544
Oct-2012	632	355	236	617	689
Nov-2012	555	269	218	605	695
Dec-2012	528	300	224	610	706
Jan-2013	589	314	201	610	651
Feb-2013	567	321	196	606	580
Mar-2013	602	312	208	638	629
Apr-2013	549	323	193	573	608
May-2013	569	348	225	643	634
Jun-2013	490	272	217	567	595
Jul-2013	473	249	196	605	614

Aug-2013	427	280	210	510	641
Sep-2013	454	295	204	422	597
Oct-2013	443	293	211	444	572
Nov-2013	414	254	193	504	549
Dec-2013	386	249	157	442	492
Jan-2014	504	344	201	476	515
Feb-2014	509	332	220	496	496
Mar-2014	520	313	186	472	492
Apr-2014	455	282	203	508	496
May-2014	411	328	187	456	499
Jun-2014	430	258	187	509	494
Jul-2014	469	279	173	485	462
Aug-2014	518	340	225	574	465
Sep-2014	489	309	141	497	422
Oct-2014	572	318	215	536	356
Nov-2014	521	294	224	490	399
Dec-2014	472	272	157	495	381
Jan-2015	519	282	234	512	458
Feb-2015	558	262	190	508	478
Mar-2015	570	246	212	476	542
Apr-2015	542	316	172	530	486
May-2015	551	338	214	540	460
Jun-2015	580	362	234	582	502
Jul-2015	732	306	208	524	452
Aug-2015	570	264	188	498	482
Sep-2015	587	272	186	496	382
Oct-2015	608	310	216	502	492
Nov-2015	484	292	194	526	526
Dec-2015	500	302	202	530	552
Jan-2016	476	288	182	520	494
Feb-2016	574	306	216	544	580

**2015 Supply Wells
Gravimetric TDS and
Production**

2015				
Well	Avg. TDS (Grav)	Production		Loading
	mg/L	AF/month	MG/year	
1	271	0.78	3.05	8080
2	301	0.31	1.20	3310
3	319	0.32	1.24	3356
4	247	1.16	4.55	10618
5	254	1.75	6.86	15154
6	281	2.72	10.63	27224
7	213	4.69	18.34	36255
8	460	4.53	17.71	76338
9	215	4.41	17.26	36392
10	294	4.05	15.85	43164
11	298	6.62	25.88	61297
12	205	5.85	22.86	36910
13	472	19.40	75.86	348848
15	358	2.42	9.46	30504
16	295	3.75	14.66	41218
17	230	4.31	16.87	36679
18 - Tipton	249	5.96	23.29	54967
19 - Duncan	213	2.17	8.49	18241
20 - Goss	359	4.25	16.62	56041
Sundance AR-1	82	7.30	28.54	19589
Sundance DN-4	123	2.19	8.57	8806

2015			
Total Dissolved Solids (mg/L) ¹			
	Supply	Bulk WW	Domestic Use
CMD ²	335	536	201
SAFB Base ³	331	969	638
SAFB Housing ³	331	467	136

¹Gravimetric TDS measurements

²Assumed supply: Supply wells flow-based average

³Assumed supply: Ellicott Booster Station

**2013 and 2015 Bulk User
Average Gravimetric TDS
and Production**

2015 Bulk User TDS Loading			
Bulk User	Avg. Flow (mgd)	Avg. TDS (mg/L)	Loading (lb/day)
CMD	1.34	536	6011
MSMD	0.25	519	1079
SAFB Base	0.10	969	807
SAFB Housing	0.05	467	211

2013 Bulk User TDS Loading			
Bulk User	Avg. Flow (mgd)	Avg. TDS (mg/L)	Loading (lb/day)
CMD	1.23	490	5027
MSMD	0.19	499	791
SAFB Base	0.11	756	694
SAFB Housing	0.05	406	169

**2015-2016 Monthly
Average Supply Well
Gravimetric TDS**

Average 2015 Well Production (MG/month)																					
	NO.1	NO.2	NO.3	NO.4	NO.5	NO.6	NO.7	NO.8	NO.9	NO.10	NO.11	NO.12	NO.13	NO.15	NO.16	NO.17	NO.18 - TIPTON	NO.19 - DUN CANS	NO.20 - GOS S	SD AR-1	SD DN-4
St Dev	0.72	0.44	0.50	1.68	1.62	2.05	3.21	4.84	7.03	4.86	6.31	5.14	11.93	2.55	2.71	2.13	5.63	1.33	3.30	1.29	3.95
Avg	0.78	0.31	0.32	1.16	1.75	2.72	4.69	4.53	4.41	4.05	6.62	5.85	19.40	2.42	3.75	4.31	5.96	2.17	4.25	2.19	6.73

Average 2015 Well Gravimetric TDS Concentration (mg/L)																					
	NO.1	NO.2	NO.3	NO.4	NO.5	NO.6	NO.7	NO.8	NO.9	NO.10	NO.11	NO.12	NO.13	NO.15	NO.16	NO.17	NO.18 - TIPTON	NO.19 - DUN CANS	NO.20 - GOS S	SD AR-1	SD DN-4
St Dev	18.20	17.06	21.98	20.84	49.15	23.90	17.26	36.30	13.85	29.60	31.30	19.05	17.49	14.00	30.52	19.80	15.84	11.27	16.61	0.42	1.55
Avg	271	301	319	247	254	281	213	460	215	294	298	205	472	358	295	230	249	213	359	82	123

**Gravimetric
Measurement-Based
Projected Water System
TDS**

Monthly Average Gravimetric TDS - Well Supply 2015-16 (mg/L)														
Well No.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1		248			268			278			290			294
2		326			304			290			284			302
3		296			320			306			354			312
4		234			0			234			274			264
5		212			336			222			244			226
6		308			298			264			254			214
7		228			224			196			202			212
8		488			422			426			502			456
9		232			210			198			218			254
10		292			340			264			280			262
11	282	272	246	316	334	362	306	276	272	310	300	302	288	307
12	234	202	212	172	214	234	208	196	186	216	218	202	182	219
13		460			488			468			470			466
14														
15		348			352			352			251			360
16					268			280			336			328
17		220			220			218			262			258
18		260			250			224			262			262
19		196			226			212			218			248
20		374			364			334			362			352
AR-1						82.3		81.8	82	82.9				
DN-4													121.6	124.7

Monthly Average Flow - Well Supply 2015-16 (AF/month)														
Well No.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1	0.01	1.33	0.00	6.55	4.74	3.52	1.95	0.01	3.24	4.69	2.65	0.05	0.00	0.01
2	0.01	1.16	0.00	3.33	2.88	0.14	0.01	0.01	3.12	0.66	0.01	0.01	0.00	0.03
3	0.01	0.72	0.00	3.90	2.97	0.18	0.01	0.01	3.57	0.34	0.01	0.01	0.00	0.02
4	0.00	3.03	0.00	0.00	0.00	-	0.05	17.44	6.65	4.43	0.34	0.17	0.10	0.16
5	13.63	5.81	7.51	11.41	4.31	0.32	12.57	0.02	4.82	3.72	0.43	0.02	19.57	17.91
6	13.75	4.76	14.91	9.83	18.91	13.68	7.75	0.01	6.87	9.47	0.20	0.01	3.96	1.62
7	0.01	6.43	17.93	14.25	25.40	20.75	20.60	24.61	22.67	19.16	0.90	0.02	0.32	2.44
8	0.01	0.00	0.00	9.38	33.54	33.30	3.87	29.39	32.80	9.99	0.61	0.03	0.00	0.04
9	9.69	0.17	0.02	5.35	74.88	35.59	10.62	11.82	1.10	6.91	2.11	4.29	1.03	0.00
10	0.06	0.20	0.01	0.24	0.02	7.91	11.47	40.69	37.71	23.32	6.42	21.24	30.23	16.34
11	24.87	63.25	19.32	44.41	0.02	4.28	21.94	34.92	15.50	0.37	2.62	12.25	0.40	0.02
12	3.08	2.23	42.37	18.55	0.00	-	-	0.31	-	12.03	37.28	27.68	0.50	0.01
13	18.69	68.56	78.96	59.72	73.04	82.56	96.81	99.58	97.44	38.63	0.20	0.22	0.49	1.15
14														
15	2.71	0.01	0.00	1.97	0.00	3.13	15.99	18.94	19.16	14.42	1.78	11.02	15.80	13.63
16	0.00	0.04	0.00	13.96	3.86	9.77	20.33	20.81	19.36	15.25	5.79	17.42	17.97	17.77
17	15.49	15.06	4.03	13.85	3.40	3.56	17.79	12.92	11.30	18.63	21.27	21.53	21.70	21.80
18	56.36	0.03	0.02	13.71	4.74	31.46	35.42	25.51	23.56	9.30	0.02	19.22	0.35	0.05
19	5.07	0.41	2.56	11.14	10.62	6.37	13.44	8.01	9.29	7.79	2.76	2.46	10.83	12.04
20	17.36	0.00	0.00	9.64	8.59	8.95	24.33	1.36	28.81	20.35	25.40	11.75	32.57	21.97
AR-1						26.78	6.92	22.02	28.08	28.68	25.55	18.77	0.32	4.64
DN-4									0.59	9.52	8.80	7.99	7.74	8.79

February-15					
Well	TDS (mg/L)	Water Pumped (AF)	(MGAL)	Mass TDS (LB)	Share
1	248	1.3	0.4	894	0.6%
2	326	1.2	0.4	1,023	0.6%
3	296	0.7	0.2	583	0.4%
4	234	3.0	1.0	1,928	1.2%
5	212	5.8	1.9	3,348	2.1%
6	308	4.8	1.6	3,983	2.5%
7	228	6.4	2.1	3,983	2.5%
8	488	0.0	0.0	6	0.0%
9	232	0.2	0.1	106	0.1%
10	292	0.2	0.1	156	0.1%
11	272	63.3	20.6	46,755	29.4%
12	202	2.2	0.7	1,226	0.8%
13	460	68.6	22.3	85,712	53.9%
14					
15	348	0.0	0.0	12	0.0%
16		0.0	0.0	0	0.0%
17	220	15.1	4.9	9,005	5.7%
18 (Tipt)	260	0.0	0.0	22	0.0%
19 (Dunc)	196	0.4	0.1	220	0.1%
20 (Goss)	374	0.0	0.0	2	0.0%
AR-1		0.0	0.0	0	0.0%
DN-4		0.0	0.0	0	0.0%
Total		173	56	158,965	

Predicted Water System Avg TDS 338

May-15					
Well	TDS (mg/L)	Water Pumped (AF)	(MGAL)	Mass TDS (LB)	Share
1	268	4.7	1.5	3,452	2.2%
2	304	2.9	0.9	2,377	1.5%
3	320	3.0	1.0	2,583	1.6%
4		0.0	0.0	0	0.0%
5	336	4.3	1.4	3,935	2.5%
6	298	18.9	6.2	15,314	9.6%
7	224	25.4	8.3	15,464	9.7%
8	422	33.5	10.9	38,466	24.2%
9	210	74.9	24.4	42,736	26.9%
10	340	0.0	0.0	17	0.0%
11	334	0.0	0.0	19	0.0%
12	214	0.0	0.0	0	0.0%
13	488	73.0	23.8	96,859	60.9%
14					
15	352	0.0	0.0	3	0.0%
16	268	3.9	1.3	2,813	1.8%
17	220	3.4	1.1	2,035	1.3%
18 (Tipt)	250	4.7	1.5	3,220	2.0%
19 (Dunc)	226	10.6	3.5	6,524	4.1%
20 (Goss)	364	8.6	2.8	8,499	5.3%
AR-1		0.0	0.0	0	0.0%
DN-4		0.0	0.0	0	0.0%
Total		272	89	244,314	

Predicted Water System Avg TDS 331

Aug-15					
Well	TDS (mg/L)	Water Pumped (AF)	(MGAL)	Mass TDS (LB)	Share
1	278	0.0	0.0	5	0.0%
2	290	0.0	0.0	6	0.0%
3	306	0.0	0.0	7	0.0%
4	234	17.4	5.7	11,090	7.0%
5	222	0.0	0.0	10	0.0%
6	264	0.0	0.0	4	0.0%
7	196	24.6	8.0	13,107	8.2%
8	426	29.4	9.6	34,022	21.4%
9	198	11.8	3.9	6,361	4.0%
10	264	40.7	13.3	29,193	18.4%
11	276	34.9	11.4	26,188	16.5%
12	196	0.3	0.1	164	0.1%
13	468	99.6	32.4	126,649	79.7%
14					
15	352	18.9	6.2	18,122	11.4%
16	280	20.8	6.8	15,834	10.0%
17	218	12.9	4.2	7,656	4.8%
18 (Tipt)	224	25.5	8.3	15,526	9.8%
19 (Dunc)	212	8.0	2.6	4,614	2.9%
20 (Goss)	334	1.4	0.4	1,232	0.8%
AR-1	81.8	22.0	7.2	4,895	3.1%
DN-4		0.0	0.0	0	0.0%
Total		368	120	314,683	

Predicted Water System Avg TDS 314

Nov-15					
Well	TDS (mg/L)	Water Pumped (AF)	(MGAL)	Mass TDS (LB)	Share
1	290	2.7	0.9	2,091	1.3%
2	284	0.0	0.0	8	0.0%
3	354	0.0	0.0	11	0.0%
4	274	0.3	0.1	254	0.2%
5	244	0.4	0.1	286	0.2%
6	254	0.2	0.1	139	0.1%
7	202	0.9	0.3	493	0.3%
8	502	0.6	0.2	825	0.5%
9	218	2.1	0.7	1,249	0.8%
10	280	6.4	2.1	4,885	3.1%
11	300	2.6	0.9	2,139	1.3%
12	218	37.3	12.1	22,088	13.9%
13	470	0.2	0.1	259	0.2%
14					
15	251	1.8	0.6	1,213	0.8%
16	336	5.8	1.9	5,283	3.3%
17	262	21.3	6.9	15,147	9.5%
18 (Tipt)	262	0.0	0.0	16	0.0%
19 (Dunc)	218	2.8	0.9	1,634	1.0%
20 (Goss)	362	25.4	8.3	24,991	15.7%
AR-1*	82.9	25.6	8.3	5,756	3.6%
DN-4**	121.6	8.8	2.9	2,909	1.8%
Total		145	47	91,677	

Predicted Water System Avg TDS 232

*Used TDS average from Oct 2015

**Used TDS average from Jan 2016

Feb-16					
Well	TDS (mg/L)	Water Pumped (AF)	(MGAL)	Mass TDS (LB)	Share
1	294	0.0	0.0	10	0.0%
2	302	0.0	0.0	21	0.0%
3	312	0.0	0.0	15	0.0%
4	264	0.2	0.1	112	0.1%
5	226	17.9	5.8	11,001	6.9%
6	214	1.6	0.5	941	0.6%
7	212	2.4	0.8	1,406	0.9%
8	456	0.0	0.0	53	0.0%
9	254	0.0	0.0	2	0.0%
10	262	16.3	5.3	11,631	7.3%
11	307	0.0	0.0	15	0.0%
12	219	0.0	0.0	5	0.0%
13	466	1.2	0.4	1,459	0.9%
14					
15	360	13.6	4.4	13,334	8.4%
16	328	17.8	5.8	15,839	10.0%
17	258	21.8	7.1	15,284	9.6%
18 (Tipt)	262	0.1	0.0	37	0.0%
19 (Dunc)	248	12.0	3.9	8,114	5.1%
20 (Goss)	352	22.0	7.2	21,019	13.2%
AR-1	82.9	4.6	1.5	1,045	0.7%
DN-4	124.7	8.8	2.9	2,977	1.9%
Total		140	46	104,322	

Predicted Water System Avg TDS 273

**Probe Conductivity
Measurement-Based
Projected Water System
TDS**

January-15					
Well	TDS (mg/L)	Water Pumped (AF)	(MGAL)	Mass TDS (LB)	Share
1	259	0.0	0.0	4	0.0%
2	311	0.0	0.0	9	0.0%
3	272	0.0	0.0	6	0.0%
4	236	0.0	0.0	2	0.0%
5	229	13.6	4.4	8,488	5.9%
6	274	13.8	4.5	10,236	7.2%
7	194	0.0	0.0	4	0.0%
8	488	0.0	0.0	7	0.0%
9	211	9.7	3.2	5,542	3.9%
10	236	0.1	0.0	37	0.0%
11	305	24.9	8.1	20,592	14.4%
12	220	3.1	1.0	1,838	1.3%
13	518	18.7	6.1	26,332	18.4%
14					
15	346	2.7	0.9	2,545	1.8%
16	0	0.0	0.0	0	0.0%
17	234	15.5	5.0	9,864	6.9%
18 (Tipt)	243	56.4	18.4	37,252	26.1%
19 (Dunc)	234	5.1	1.7	3,219	2.3%
20 (Goss)	359	17.4	5.7	16,941	11.9%
AR-1		0.0	0.0	0	0.0%
DN-4		0.0	0.0	0	0.0%
Total		181	59	142,918	

Predicted Water System Avg TDS 291

February-15					
Well	TDS (mg/L)	Water Pumped (AF)	(MGAL)	Mass TDS (LB)	Share
1	289	1.3	0.4	1,041	0.7%
2	306	1.2	0.4	960	0.7%
3	286	0.7	0.2	563	0.4%
4	237	3.0	1.0	1,951	1.4%
5	216	5.8	1.9	3,406	2.4%
6	291	4.8	1.6	3,766	2.6%
7	193	6.4	2.1	3,365	2.4%
8	483	0.0	0.0	6	0.0%
9	251	0.2	0.1	115	0.1%
10	359	0.2	0.1	192	0.1%
11	234	63.3	20.6	40,155	28.1%
12	174	2.2	0.7	1,057	0.7%
13	530	68.6	22.3	98,779	69.1%
14					
15	338	0.0	0.0	11	0.0%
16		0.0	0.0	0	0.0%
17	220	15.1	4.9	8,994	6.3%
18 (Tipt)	241	0.0	0.0	20	0.0%
19 (Dunc)	225	0.4	0.1	253	0.2%
20 (Goss)	363	0.0	0.0	2	0.0%
AR-1		0.0	0.0	0	0.0%
DN-4		0.0	0.0	0	0.0%
Total		173	56	164,637	

Predicted Water System Avg TDS 350

March-15					
Well	TDS (mg/L)	Water Pumped (AF)		Mass TDS (LB)	Share
			(MGAL)		
1	294	0.0	0.0	3	0.0%
2	296	0.0	0.0	3	0.0%
3		0.0	0.0	0	0.0%
4	239	0.0	0.0	3	0.0%
5	221	7.5	2.4	4,506	3.2%
6	291	14.9	4.9	11,776	8.2%
7	209	17.9	5.8	10,195	7.1%
8		0.0	0.0	0	0.0%
9	221	0.0	0.0	13	0.0%
10		0.0	0.0	0	0.0%
11	273	19.3	6.3	14,347	10.0%
12	207	42.4	13.8	23,878	16.7%
13	511	79.0	25.7	109,542	76.6%
14					
15	346	0.0	0.0	3	0.0%
16	264	0.0	0.0	3	0.0%
17	236	4.0	1.3	2,588	1.8%
18 (Tipt)	250	0.0	0.0	11	0.0%
19 (Dunc)	226	2.6	0.8	1,574	1.1%
20 (Goss)	361	0.0	0.0	3	0.0%
AR-1		0.0	0.0	0	0.0%
DN-4		0.0	0.0	0	0.0%
Total		188	61	178,447	

Predicted Water System Avg TDS 350

April-15					
Well	TDS (mg/L)	Water Pumped (AF)	(MGAL)	Mass TDS (LB)	Share
1	283	6.5	2.1	5,036	3.5%
2	265	3.3	1.1	2,401	1.7%
3	260	3.9	1.3	2,757	1.9%
4		0.0	0.0	0	0.0%
5	216	11.4	3.7	6,687	4.7%
6	289	9.8	3.2	7,729	5.4%
7	215	14.2	4.6	8,326	5.8%
8	396	9.4	3.1	10,086	7.1%
9	239	5.3	1.7	3,479	2.4%
10		0.2	0.1	0	0.0%
11	287	44.4	14.5	34,604	24.2%
12	180	18.6	6.0	9,099	6.4%
13	503	59.7	19.5	81,643	57.1%
14					
15	354	2.0	0.6	1,892	1.3%
16		14.0	4.5	0	0.0%
17	232	13.8	4.5	8,718	6.1%
18 (Tipt)	248	13.7	4.5	9,249	6.5%
19 (Dunc)	232	11.1	3.6	7,035	4.9%
20 (Goss)	359	9.6	3.1	9,404	6.6%
AR-1		0.0	0.0	0	0.0%
DN-4		0.0	0.0	0	0.0%
Total		251	82	208,144	

Predicted Water System Avg TDS 305

May-15					
Well	TDS (mg/L)	Water Pumped (AF)	(MGAL)	Mass TDS (LB)	Share
1	256	4.7	1.5	3,298	2.3%
2	294	2.9	0.9	2,297	1.6%
3	320	3.0	1.0	2,583	1.8%
4		0.0	0.0	0	0.0%
5	332	4.3	1.4	3,882	2.7%
6	292	18.9	6.2	14,998	10.5%
7	215	25.4	8.3	14,846	10.4%
8	415	33.5	10.9	37,860	26.5%
9	210	74.9	24.4	42,720	29.9%
10	303	0.0	0.0	15	0.0%
11	269	0.0	0.0	15	0.0%
12	180	0.0	0.0	0	0.0%
13	456	73.0	23.8	90,529	63.3%
14					
15	349	0.0	0.0	3	0.0%
16	275	3.9	1.3	2,888	2.0%
17	225	3.4	1.1	2,083	1.5%
18 (Tipt)	248	4.7	1.5	3,190	2.2%
19 (Dunc)	230	10.6	3.5	6,632	4.6%
20 (Goss)	359	8.6	2.8	8,383	5.9%
AR-1		0.0	0.0	0	0.0%
DN-4		0.0	0.0	0	0.0%
Total		272	89	236,222	

Predicted Water System Avg TDS 320

June-15					
Well	TDS (mg/L)	Water Pumped (AF)	(MGAL)	Mass TDS (LB)	Share
1	264	3.5	1.1	2,523	1.8%
2	263	0.1	0.0	102	0.1%
3	252	0.2	0.1	125	0.1%
4	0	0.0	0.0	0	0.0%
5	214	0.3	0.1	185	0.1%
6	294	13.7	4.5	10,947	7.7%
7	214	20.8	6.8	12,090	8.5%
8	427	33.3	10.9	38,630	27.0%
9	205	35.6	11.6	19,810	13.9%
10	300	7.9	2.6	6,440	4.5%
11	250	4.3	1.4	2,900	2.0%
12	177	0.0	0.0	0	0.0%
13	496	82.6	26.9	111,218	77.8%
14					
15	319	3.1	1.0	2,711	1.9%
16	289	9.8	3.2	7,660	5.4%
17	230	3.6	1.2	2,229	1.6%
18 (Tipt)	252	31.5	10.3	21,561	15.1%
19 (Dunc)	230	6.4	2.1	3,977	2.8%
20 (Goss)	359	9.0	2.9	8,734	6.1%
AR-1	90	26.8	8.7	6,521	4.6%
DN-4	128	0.0	0.0	0	0.0%
Total		292	95	258,363	

Predicted Water System Avg TDS 325

July-15					
Well	TDS (mg/L)	Water Pumped (AF)	(MGAL)	Mass TDS (LB)	Share
1	295	1.9	0.6	1,559	1.1%
2	313	0.0	0.0	8	0.0%
3	275	0.0	0.0	4	0.0%
4	262	0.0	0.0	34	0.0%
5	252	12.6	4.1	8,612	6.0%
6	324	7.7	2.5	6,833	4.8%
7	215	20.6	6.7	12,037	8.4%
8	506	3.9	1.3	5,320	3.7%
9	232	10.6	3.5	6,707	4.7%
10	296	11.5	3.7	9,232	6.5%
11	266	21.9	7.1	15,852	11.1%
12	172	0.0	0.0	0	0.0%
13	508	96.8	31.5	133,685	93.5%
14					
15	289	16.0	5.2	12,544	8.8%
16	292	20.3	6.6	16,104	11.3%
17	230	17.8	5.8	11,139	7.8%
18 (Tipt)	282	35.4	11.5	27,169	19.0%
19 (Dunc)	230	13.4	4.4	8,415	5.9%
20 (Goss)	355	24.3	7.9	23,487	16.4%
AR-1	90	6.9	2.3	1,686	1.2%
DN-4	128	0.0	0.0	0	0.0%
Total		322	105	300,430	

Predicted Water System Avg TDS 343

August-15					
Well	TDS (mg/L)	Water Pumped (AF)	(MGAL)	Mass TDS (LB)	Share
1	248	0.0	0.0	4	0.0%
2	302	0.0	0.0	7	0.0%
3	302	0.0	0.0	7	0.0%
4	236	17.4	5.7	11,207	7.8%
5	233	0.0	0.0	11	0.0%
6	269	0.0	0.0	4	0.0%
7	215	24.6	8.0	14,359	10.0%
8	436	29.4	9.6	34,808	24.4%
9	207	11.8	3.9	6,661	4.7%
10	269	40.7	13.3	29,794	20.8%
11	260	34.9	11.4	24,716	17.3%
12	188	0.3	0.1	157	0.1%
13	496	99.6	32.4	134,192	93.9%
14					
15	349	18.9	6.2	17,990	12.6%
16	294	20.8	6.8	16,648	11.6%
17	231	12.9	4.2	8,114	5.7%
18 (Tipt)	252	25.5	8.3	17,500	12.2%
19 (Dunc)	221	8.0	2.6	4,805	3.4%
20 (Goss)	358	1.4	0.4	1,322	0.9%
AR-1	90	22.0	7.2	5,361	3.8%
DN-4	128	0.0	0.0	0	0.0%
Total		368	120	327,667	

Predicted Water System Avg TDS 327

September-15					
Well	TDS (mg/L)	Water Pumped (AF)	(MGAL)	Mass TDS (LB)	Share
1	297	3.2	1.1	2,614	1.8%
2	343	3.1	1.0	2,906	2.0%
3	303	3.6	1.2	2,940	2.1%
4	275	6.7	2.2	4,968	3.5%
5	253	4.8	1.6	3,322	2.3%
6	218	6.9	2.2	4,063	2.8%
7	238	22.7	7.4	14,664	10.3%
8	479	32.8	10.7	42,733	29.9%
9	250	1.1	0.4	745	0.5%
10	282	37.7	12.3	28,922	20.2%
11	268	15.5	5.0	11,278	7.9%
12	172	0.0	0.0	0	0.0%
13	513	97.4	31.7	135,707	95.0%
14					
15	362	19.2	6.2	18,844	13.2%
16	328	19.4	6.3	17,239	12.1%
17	255	11.3	3.7	7,820	5.5%
18 (Tipt)	246	23.6	7.7	15,737	11.0%
19 (Dunc)	251	9.3	3.0	6,337	4.4%
20 (Goss)	387	28.8	9.4	30,267	21.2%
AR-1	90	28.1	9.1	6,836	4.8%
DN-4	128	0.6	0.2	204	0.1%
Total		376	122	358,147	

Predicted Water System Avg TDS 351

October-15					
Well	TDS (mg/L)	Water Pumped (AF)	(MGAL)	Mass TDS (LB)	Share
1	338	4.7	1.5	4,310	3.0%
2	294	0.7	0.2	528	0.4%
3	316	0.3	0.1	290	0.2%
4	276	4.4	1.4	3,321	2.3%
5	249	3.7	1.2	2,513	1.8%
6	301	9.5	3.1	7,745	5.4%
7	234	19.2	6.2	12,197	8.5%
8	511	10.0	3.3	13,867	9.7%
9	236	6.9	2.3	4,435	3.1%
10	284	23.3	7.6	18,008	12.6%
11	280	0.4	0.1	282	0.2%
12	209	12.0	3.9	6,823	4.8%
13	504	38.6	12.6	52,902	37.0%
14					
15	368	14.4	4.7	14,408	10.1%
16	332	15.3	5.0	13,753	9.6%
17	248	18.6	6.1	12,575	8.8%
18 (Tipt)	255	9.3	3.0	6,451	4.5%
19 (Dunc)	247	7.8	2.5	5,220	3.7%
20 (Goss)	385	20.4	6.6	21,275	14.9%
AR-1	90	28.7	9.3	6,983	4.9%
DN-4	128	9.5	3.1	3,312	2.3%
Total		258	84	211,198	

Predicted Water System Avg TDS 302

November-15					
Well	TDS (mg/L)	Water Pumped (AF)	(MGAL)	Mass TDS (LB)	Share
1	380	2.7	0.9	2,736	1.9%
2	291	0.0	0.0	8	0.0%
3	291	0.0	0.0	9	0.0%
4	277	0.3	0.1	257	0.2%
5	244	0.4	0.1	286	0.2%
6	238	0.2	0.1	131	0.1%
7	216	0.9	0.3	528	0.4%
8	506	0.6	0.2	832	0.6%
9	236	2.1	0.7	1,349	0.9%
10	281	6.4	2.1	4,902	3.4%
11	312	2.6	0.9	2,227	1.6%
12	207	37.3	12.1	21,010	14.7%
13	349	0.2	0.1	193	0.1%
14					
15	372	1.8	0.6	1,799	1.3%
16	336	5.8	1.9	5,283	3.7%
17	242	21.3	6.9	13,986	9.8%
18 (Tipt)	273	0.0	0.0	17	0.0%
19 (Dunc)	243	2.8	0.9	1,818	1.3%
20 (Goss)	363	25.4	8.3	25,051	17.5%
AR-1	90	25.6	8.3	6,221	4.4%
DN-4	128	8.8	2.9	3,062	2.1%
Total		145	47	91,706	

Predicted Water System Avg TDS 232

December-15					
Well	TDS (mg/L)	Water Pumped (AF)	(MGAL)	Mass TDS (LB)	Share
1	287	0.0	0.0	36	0.0%
2	294	0.0	0.0	10	0.0%
3	328	0.0	0.0	7	0.0%
4	257	0.2	0.1	116	0.1%
5	232	0.0	0.0	13	0.0%
6	220	0.0	0.0	7	0.0%
7	200	0.0	0.0	9	0.0%
8	477	0.0	0.0	38	0.0%
9	239	4.3	1.4	2,791	2.0%
10	271	21.2	6.9	15,629	10.9%
11	308	12.2	4.0	10,268	7.2%
12	211	27.7	9.0	15,888	11.1%
13	457	0.2	0.1	268	0.2%
14					
15	345	11.0	3.6	10,346	7.2%
16	338	17.4	5.7	16,013	11.2%
17	245	21.5	7.0	14,322	10.0%
18 (Tipt)	260	19.2	6.3	13,570	9.5%
19 (Dunc)	227	2.5	0.8	1,517	1.1%
20 (Goss)	358	11.7	3.8	11,441	8.0%
AR-1	90	18.8	6.1	4,570	3.2%
DN-4	128	8.0	2.6	2,779	1.9%
Total		176	57	119,637	

Predicted Water System Avg TDS 250

January-16					
Well	TDS (mg/L)	Water Pumped (AF)	(MGAL)	Mass TDS (LB)	Share
1	280	0.0	0.0	4	0.0%
2	308	0.0	0.0	0	0.0%
3	383	0.0	0.0	0	0.0%
4	278	0.1	0.0	78	0.1%
5	252	19.6	6.4	13,379	9.4%
6	243	4.0	1.3	2,615	1.8%
7	208	0.3	0.1	182	0.1%
8	490	0.0	0.0	0	0.0%
9	253	1.0	0.3	710	0.5%
10	287	30.2	9.8	23,606	16.5%
11	330	0.4	0.1	355	0.2%
12	213	0.5	0.2	290	0.2%
13	463	0.5	0.2	618	0.4%
14					
15	310	15.8	5.1	13,328	9.3%
16	345	18.0	5.9	16,850	11.8%
17	253	21.7	7.1	14,908	10.4%
18 (Tipt)	267	0.4	0.1	255	0.2%
19 (Dunc)	230	10.8	3.5	6,778	4.7%
20 (Goss)	376	32.6	10.6	33,249	23.3%
AR-1	90	0.3	0.1	77	0.1%
DN-4	128	7.7	2.5	2,691	1.9%
Total		164	53	129,973	

Predicted Water System Avg TDS 292

February-16					
Well	TDS (mg/L)	Water Pumped (AF)	(MGAL)	Mass TDS (LB)	Share
1	273	0.0	0.0	9	0.0%
2	287	0.0	0.0	20	0.0%
3	299	0.0	0.0	14	0.0%
4	255	0.2	0.1	108	0.1%
5	216	17.9	5.8	10,499	7.3%
6	207	1.6	0.5	912	0.6%
7	196	2.4	0.8	1,299	0.9%
8	456	0.0	0.0	53	0.0%
9	253	0.0	0.0	2	0.0%
10	273	16.3	5.3	12,103	8.5%
11	277	0.0	0.0	14	0.0%
12	187	0.0	0.0	5	0.0%
13	480	1.2	0.4	1,503	1.1%
14					
15	280	13.6	4.4	10,371	7.3%
16	324	17.8	5.8	15,639	10.9%
17	236	21.8	7.1	13,990	9.8%
18 (Tipt)	254	0.1	0.0	36	0.0%
19 (Dunc)	234	12.0	3.9	7,664	5.4%
20 (Goss)	350	22.0	7.2	20,905	14.6%
AR-1	90	4.6	1.5	1,130	0.8%
DN-4	128	8.8	2.9	3,056	2.1%
Total		140	46	99,331	

Predicted Water System Avg TDS 260

**Black Forest Phase 1 & 2
Predicted Water System
TDS**

Rough TDS Mass Balance

Water System

Year	2016		
Projected Annual Demand	4,013	AFY	Assume 2% annual growth in projected demands
Equivalent Avg Month	334	AF/MO	
Peak Month	1.77	592	AF/MO
In Basin Demand	0.22	130	

Well	TDS (mg/L)	Water Avail. (AF/MO)	Water Pumped		Mass TDS (LB)	Share
			(AF)	(MGAL)		
1	271	17.8	17.0	5.5	12,540	3.1%
2	301	18.0	17.0	5.5	13,906	3.4%
3	319	19.7	19.0	6.2	16,471	4.1%
4	247	41.5	41.0	13.4	27,558	6.8%
5	254	35.4	35.0	11.4	24,112	5.9%
6	281	21.4	21.0	6.8	16,036	3.9%
7	213	27.6	27.0	8.8	15,592	3.8%
8	460	31.8		0.0	0	0.0%
9	215	77.8	77.0	25.1	44,885	11.0%
10	294	44.1	44.0	14.3	35,155	8.6%
11	298	66.7	48.0	15.6	38,854	9.6%
12	205	53.4	53.0	17.3	29,571	7.3%
13	472	112.5		0.0	0	0.0%
14						
15	358	24.3		0.0	0	0.0%
16	295	21.4	21.0	6.8	16,816	4.1%
17	230	19.9	19.0	6.2	11,876	2.9%
18 (Tipt)	249	95.7	95.0	31.0	64,285	15.8%
19 (Dunc)	213	14.2	14.0	4.6	8,104	2.0%
20 (Goss)	359	52.2	23.0	7.5	22,408	5.5%
BF Ph 1	150	63.0	20.6	6.7	8,391	2.1%
BF Ph 2	150	0.0	0.0	0.0	0	0.0%
Total		858	592	193	406,560	

Projected Water System Avg TDS **253**

Water Supply Distribution

Source	Vol (AF/MO)	Percentage	Avg Vol (AFY)
UBSC Alluvial	571	97%	3871
Denver Basin	21	3%	140

Rough TDS Mass Balance

Water System

Year	2017		
Projected Annual Demand	4,091	AFY	Assume 2% annual growth in projected demands
Equivalent Avg Month	341	AF/MO	
Peak Month	1.77	603	AF/MO
In Basin Demand	0.22	133	

Well	TDS (mg/L)	Water Avail. (AF/MO)	Water Pumped (AF)	(MGAL)	Mass TDS (LB)	Share
1	271	17.8	17.0	5.5	12,540	3.0%
2	301	18.0	17.0	5.5	13,906	3.3%
3	319	19.7	19.0	6.2	16,471	3.9%
4	247	41.5	41.0	13.4	27,558	6.6%
5	254	35.4	35.0	11.4	24,112	5.8%
6	281	21.4	21.0	6.8	16,036	3.8%
7	213	27.6	27.0	8.8	15,592	3.7%
8	460	31.8		0.0	0	0.0%
9	215	77.8	77.0	25.1	44,885	10.8%
10	294	44.1	44.0	14.3	35,155	8.4%
11	298	66.7	48.0	15.6	38,854	9.3%
12	205	53.4	53.0	17.3	29,571	7.1%
13	472	112.5		0.0	0	0.0%
14						
15	358	24.3		0.0	0	0.0%
16	295	21.4	21.0	6.8	16,816	4.0%
17	230	19.9	19.0	6.2	11,876	2.8%
18 (Tipt)	249	95.7	95.0	31.0	64,285	15.4%
19 (Dunc)	213	14.2	14.0	4.6	8,104	1.9%
20 (Goss)	359	52.2	34.0	11.1	33,125	7.9%
BF Ph 1	150	63.0	20.6	6.7	8,391	2.0%
BF Ph 2	150	0.0	0.0	0.0	0	0.0%
Total		858	603	196	417,277	

Projected Water System Avg TDS 255

Water Supply Distribution

Source	Vol (AF/MO)	Percentage	Avg Vol (AFY)
UBSC Alluvial	582	97%	3946
Denver Basin	21	3%	140

Rough TDS Mass Balance

Water System

Year	2018		
Projected Annual Demand	4,170	AFY	Assume 2% annual growth in projected demands
Equivalent Avg Month	348	AF/MO	
Peak Month	1.77	615	AF/MO
In Basin Demand	0.22	135	

Well	TDS (mg/L)	Water Avail. (AF/MO)	Water Pumped		Mass TDS (LB)	Share
			(AF)	(MGAL)		
1	271	17.8	17.0	5.5	12,540	3.0%
2	301	18.0	17.0	5.5	13,906	3.3%
3	319	19.7	19.0	6.2	16,471	3.9%
4	247	41.5	41.0	13.4	27,558	6.6%
5	254	35.4	35.0	11.4	24,112	5.7%
6	281	21.4	21.0	6.8	16,036	3.8%
7	213	27.6	27.0	8.8	15,592	3.7%
8	460	31.8		0.0	0	0.0%
9	215	77.8	77.0	25.1	44,885	10.7%
10	294	44.1	44.0	14.3	35,155	8.4%
11	298	66.7	48.0	15.6	38,854	9.3%
12	205	53.4	53.0	17.3	29,571	7.0%
13	472	112.5		0.0	0	0.0%
14						
15	358	24.3		0.0	0	0.0%
16	295	21.4	21.0	6.8	16,816	4.0%
17	230	19.9	19.0	6.2	11,876	2.8%
18 (Tipt)	249	95.7	95.0	31.0	64,285	15.3%
19 (Dunc)	213	14.2	14.0	4.6	8,104	1.9%
20 (Goss)	359	52.2	29.0	9.4	28,253	6.7%
BF Ph 1	150	63.0	20.6	6.7	8,391	2.0%
BF Ph 2	150	27.1	17.6	5.7	7,171	1.7%
Total		886	615	200	419,576	

Projected Water System Avg TDS **251**

Water Supply Distribution

Source	Vol (AF/MO)	Percentage	Avg Vol (AFY)
UBSC Alluvial	577	94%	3912
Denver Basin	38	6%	259

Rough TDS Mass Balance

Water System

Year	2019		
Projected Annual Demand	4,249	AFY	Assume 2% annual growth in projected demands
Equivalent Avg Month	354	AF/MO	
Peak Month	1.77	627	AF/MO
In Basin Demand	0.22	138	

Well	TDS (mg/L)	Water Avail. (AF/MO)	Water Pumped		Mass TDS (LB)	Share
			(AF)	(MGAL)		
1	271	17.8	17.0	5.5	12,540	2.9%
2	301	18.0	17.0	5.5	13,906	3.3%
3	319	19.7	19.0	6.2	16,471	3.9%
4	247	41.5	41.0	13.4	27,558	6.5%
5	254	35.4	35.0	11.4	24,112	5.7%
6	281	21.4	21.0	6.8	16,036	3.8%
7	213	27.6	27.0	8.8	15,592	3.7%
8	460	31.8		0.0	0	0.0%
9	215	77.8	77.0	25.1	44,885	10.6%
10	294	44.1	44.0	14.3	35,155	8.3%
11	298	66.7	48.0	15.6	38,854	9.1%
12	205	53.4	53.0	17.3	29,571	7.0%
13	472	112.5		0.0	0	0.0%
14						
15	358	24.3		0.0	0	0.0%
16	295	21.4	21.0	6.8	16,816	4.0%
17	230	19.9	19.0	6.2	11,876	2.8%
18 (Tipt)	249	95.7	95.0	31.0	64,285	15.1%
19 (Dunc)	213	14.2	14.0	4.6	8,104	1.9%
20 (Goss)	359	52.2	31.0	10.1	30,202	7.1%
BF Ph 1	150	192.4	20.6	6.7	8,391	2.0%
BF Ph 2	150	27.1	27.1	8.8	11,064	2.6%
Total		1,015	627	204	425,418	

Predicted Water System Avg TDS **250**

Water Supply Distribution

Source	Vol (AF/MO)	Percentage	Avg Vol (AFY)
UBSC Alluvial	579	92%	3925
Denver Basin	48	8%	324

Water Softener Prohibition Resolution

RESOLUTION 14-06

RESOLUTION PROHIBITION OF WATER SOFTENERS WITHIN THE
CHEROKEE METRO DISTRICT AND ANY SEWER CONNECTED SYSTEM

WHEREAS wastewater discharge permit environmental regulations for the District's sewer collection and treatment system were tightened as the District's customer base grew from the mid-1990's through mid 2000's, and therefore a new wastewater treatment facility was required to meet standards on the E. fork of Sand Creek and downstream on Fountain Creek by the Colorado Department of Public Health and Environment, who has primacy on discharge permit as authorized by US EPA; and

WHEREAS the District's staff and engineering consultant suspected in 2009 that there was a substantial influence on the Total Dissolved Solids (TDS) in the District's wastewater system due to residential use and possibly from the salt exchange taking place in commercial and residential water softeners that may be in use by the District's customers (see July 2009 GMS memo and CDPHE communications); and

WHEREAS the District's technological inability to meet the current CDPHE Reg. 41 Groundwater Standard for TDS at 400 mg/L and is thus subject to a CDPHE Compliance Order on Consent (COC) number MC-140514-1 due to consistent violations of wastewater permit standards on TDS; and

WHEREAS the District's Staff, the TDS Compliance Feasibility Team (Forsgren/HatchMott MacDonald/D.Akers/C.King, and the Board of Directors have been engaged in an ongoing discussion and feasibility study to develop a variety of potential solutions to reduce, mitigate and remove TDS from the water supply and wastewater systems in a focused effort to drive compliance related actions, facilities and operations.

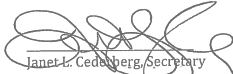
THEREFORE, be it resolved that on this 10th day of November 2014, the District's Board of Directors, having duly noticed the topic for board discussion and made available public comment on the proposed resolution, hereby enacts a prohibition on the use of domestic water softeners within the District's service area and connected systems to the extent allowable by law.

Adopted by the Board of Directors of the Cherokee Metropolitan District.

CHEROKEE METROPOLITAN DISTRICT

By: 
Larry Kelsner, President


Dave Mattes, Vice President


Janet L. Cedeno, Secretary

