



Cherokee Metropolitan District Water Reclamation Facility Total Dissolved Solids Compliance Implementation Plan

Compliance Order on Consent

Number: MC-140514-1



January 16, 2015

FORSGREN
Associates Inc.

56 Inverness Drive East, Suite 112
Englewood, CO 80112

 **Hatch Mott
MacDonald**

143 Union Blvd., Suite 1000
Lakewood, CO 80228

TABLE OF CONTENTS

1.1 INTRODUCTION..... 1
1.2 REGULATORY OPTIONS..... 3
1.3 BRINE DISPOSAL..... 3
1.4 TDS REMOVAL FACILITY 4
1.5 SOURCE CONTROL..... 4
1.6 STAKEHOLDER OUTREACH..... 4
1.7 STAFFING 5
1.8 FUNDING..... 5

APPENDICES
APPENDIX A
TDS SAMPLING PLAN
APPENDIX B
OUTREACH PLAN

1.1 INTRODUCTION

As indicated in the Total Dissolved Solids Compliance Feasibility Study submitted to the Colorado Department of Public Health and Environment Division on December 19, 2014, Cherokee Metropolitan District (CMD) is pursuing a multi-phase strategy to achieve compliance with its permitted TDS limit. The tasks presented in the proposed implementation plan schedule shown on the next page are organized by the following categories.

1. Regulatory Options
2. Brine Disposal
3. TDS Removal Facility
4. Source Control
5. Stakeholder Outreach
6. Staffing
7. Funding

A brief discussion of each of the above categories is provided following the implementation plan schedule.

Implementation Plan Schedule

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
	2015	2016	2017	2018	2019	2020	2021	2022
Regulatory	1 - Meet w/WQCD to discuss regulatory options 2 - Submit permit variance request 3 - Review draft discharge permit - re: inclusion of a compliance schedule or a variance 4 - Review final permit 5 - Develop supporting information for Reg. 41 TDS standard change 6 - Testify at August TriIH hearing 7 - Prepare formal testimony for rulemaking hearing to revise TDS standard in Reg. 41 8 - Testify in support of WQCD proposal to modify Reg. 41 TDS standard at February RMH 9 - Propose site-specific TDS standard in Reg. 42 if necessary							
Brine Disposal		1 - Deep Injection Well Feasibility Study (Paper study), \$50k			2 - Prepare Deep Injection Well Permit Application, \$50k 3 - EPA Permit Review/Approval to Construct 4 - Construct Deep Injection Wells and Test, \$6M 5 - Evaluate Well Testing Data, \$40k 6 - Permit Review/Approval to Inject, \$50k		7 - Design/Construct Deep Injection Well Pumping System, \$4M	
TDS Removal Facility	1 - Increased Data Gathering (ongoing)	2 - Data Evaluation/Treatment Technology Review/Flow Projections, \$50k	3a - Pilot Testing Planning/Design/CDPHE Coordination, \$50k 3b - Pilot Testing, \$350k	4 - Preliminary Design/Prepare Site Application, \$250k	5 - Site Application Amendment Approval, incl. above	6 - Design and CDPHE Design Approval, \$750k 7 - Bidding/NTP, incl. above	8 - Construction/Startup of 1st phase of TDS Removal Facility, \$10.6M	
Range	\$200k - \$400k	\$200k - \$400k	\$200k - \$400k	\$250k - \$500k	\$225k - \$450k	\$5.1M - \$10.2M	\$11M - \$22M	
Total	\$24.0M (\$17.2M - \$34.4M) Costs to Implement Alternative 400-A, Items Listed Above							
Source Control	1 - Reduce use of high TDS wells (primarily Well 13) 3 - Industrial BMPs (ongoing) 4 - Regenerative Softener Moratorium (complete) 5 - Evaluate data to determine benefits of softener moratorium and BMP's 6 - Confirm relationship between drinking water TDS and wastewater TDS 7 - Investigate SAFB housing TDS to confirm it is lower than CMD and MSMD and, if so, why. 8 - Investigate potential for additional agricultural irrigation users.		2 - Complete augmentation plan and develop Black Forest Dawson well; estimate TDS reduction at WRF					
Customer Outreach	1 - Customers (ongoing) 2 - Farmer Family and downgradient land owners/water rights owners (ongoing) 3 - UBSC Management District (ongoing) 4 - Meridian (ongoing) 6 - Woodmen Hills (ongoing) 7 - Schriever AFB (ongoing)							
Staffing	1 - Assign compliance manager to oversee data collection and analysis (complete) 2 - Hire district engineer to provide and coordinate technical support (complete) 3 - Hire full-time outreach and involvement coordinator				4 - Hire or assign TDS treatment lead operator		5 - Hire or assign additional operations staff as needed (and backfill prior positions as needed)	

1.2 REGULATORY OPTIONS

As was indicated in the December 2014 Feasibility Study, CMD is pursuing a compliance strategy that will involve pursuit of potential regulatory actions while simultaneously moving forward to develop and implement a membrane treatment project to remove TDS from the discharge to the rapid infiltration basins.

Some of the potential regulatory actions (e.g., variance or compliance schedule) would provide short-term relief intended to bring CMD into compliance with the TDS limit in the renewal permit. This is appropriate given that CMD did not have the opportunity to address the TDS limit in the design of the WRF/RIB project. CMD, and presumably the Division, would prefer to simplify the process by seeking only one form of short-term relief. Therefore, if the Division is open to granting CMD a compliance schedule in the renewal permit, then CMD would not seek a variance from the TDS limit.

CMD understands that the Division may be proposing to raise the TDS criteria in Regulation No. 41 to 500 mg/l consistent with EPA's secondary drinking water standard. CMD plans to participate in the hearing process to support the Division should this proposal be brought forward to the Commission.

If the Commission adopts a 500 mg/l standard, should further data collection and investigation of alternative raw water sources show that it can be met without effluent treatment, CMD may choose that option. If an investigation of the use of alternative water sources shows that CMD could meet a limit that is slightly higher than 500 mg/l, then CMD could pursue that option through a request for a site-specific standard under Regulation No. 42.

1.3 BRINE DISPOSAL

One of the critical tasks to implement a membrane treatment project to remove TDS is to further evaluate and develop a brine disposal alternative. As presented in the Feasibility Study, it appears that the use of deep injection wells to dispose of brine is likely to be the most feasible alternative. Without a reliable brine disposal option, treatment to remove TDS is not feasible, thus it is essential to establish a reliable brine disposal option, to the extent reasonable, prior to progressing too far with the development of treatment.

The implementation tasks for brine disposal are based on developing deep injection wells as presented below. These tasks will need to be adjusted based on task results, including the potential that alternative brine disposal options, such as evaporation ponds, may need to be considered.

1. Complete deep injection well feasibility study
2. Prepare and submit construction permit application to EPA
3. EPA permit review and approval to construct deep injection well(s) – Based on previous experience with permitting deep injection wells, this process can take 12 months to complete
4. Construct and test deep injection well(s)
5. Evaluate well testing data
6. Prepare and submit injection permit application

1.4 TDS REMOVAL FACILITY

As presented in the Feasibility Study, there are a number of treatment technologies and considerations that will impact the final treatment technology, capacity, and location. The results of the regulatory options task and the brine disposal task will significantly impact the development of the treatment removal facility and, to the extent possible, should be completed prior to significant development of the TDS treatment process. Additionally, as discussed in the Feasibility Study, a significantly more robust and reliable data set is needed to establish the needed TDS removal treatment capacity and support the process design. This task is included as part of the TDS Removal Facility implementation elements, but will occur even if the results then point to another form of compliance, possibly in concert with a regulatory change.

The implementation tasks for developing a TDS removal facility are presented below.

1. Gather additional data required to scope and design the membrane treatment project to remove TDS
2. Evaluate data, treatment capacity needs, and treatment processes to be pilot tested
3. Complete pilot testing of preferred treatment technologies – Given the more complex wastewater matrix, pilot testing of preferred treatment processes is recommended to develop needed design and performance information to select and design the full-scale treatment facility
4. Complete preliminary design and receive site application amendment approval from Division
5. Complete design and receive design review approval from Division
6. Bid treatment project
7. Construct and startup treatment project – based on previous experience, a 24-month construction duration is appropriate for this type of facility.

1.5 SOURCE CONTROL

The sources of TDS in CMD's wastewater were discussed and presented in the Feasibility Study. CMD is implementing a number of source control activities, including working with industrial dischargers to establish best management practices (BMPs). The CMD Board took action at their regular November 2014 meeting to prohibit residential water softeners, and the District will manage its drinking water supplies to use lower TDS sources to the extent possible.

CMD will be evaluating TDS data to try to determine the TDS reduction due to their source control actions. In particular, CMD will be starting up its recently constructed Sundance wells in the Black Forest area that draw water from the Denver Basin. Initial TDS results from this source are lower than CMD's UBSC wells, which may result in a reduction of the wastewater effluent TDS.

The implementation tasks for source control are presented below.

1. Reduce the use, to the extent possible, of high TDS wells
2. Complete the augmentation plan on the Sundance Dawson well, then construct and put 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 extend 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

1.6 STAKEHOLDER OUTREACH

Stakeholder outreach is a key component of CMD's implementation plan. A separate outreach plan report was developed and is included in the appendix of this report.

1.7 STAFFING

CMD's staffing is being modified to support compliance and implementation efforts, including:

1. Having reassigned a current staff member in June 2014 to a new compliance manager position to oversee data collection and analysis
2. Having hired a new staff district engineer in June 2014 to provide technical and coordination support for the implementation plan
3. Having reassigned a current staff member in November 2014 to lead SCADA/telemetry technician to improve the means of data collection and storage
4. Interviewing candidates to fill a new full-time position of outreach coordinator, to assist with customer and stakeholder communication

Additionally, CMD is planning to hire additional treatment operations staff, including a new lead operator for the TDS removal facility, at the appropriate time.

1.8 FUNDING

CMD is prepared to identify and secure funding for the implementation of a compliance solution, possibly including construction of a new membrane treatment project to remove TDS in line with the schedule presented in this implementation plan. Initially, CMD has increased wastewater rates to begin collecting revenue to support achieving TDS compliance. CMD plans to evaluate rates and connection fees annually. In addition, CMD will begin evaluating potential funding sources such as the State Revolving Fund loan program, Colorado Water Conservation Board loan program, United States Bureau of Reclamation grants, and relevant bonding options.

CMD is taking, and will take the following steps to fund the compliance solution:

1. In January 2015, implement a 7.6 percent increase to base sewer rate, plus 5.85 percent increase to volume charge
2. In January 2015, implement a 6.3 percent increase to sewer connection fees
3. Evaluate applicability of several possible state and federal grant funds, and apply for those that can support the District's efforts
4. Evaluate several options for financing construction of TDS removal and brine disposal facilities, and secure financing during design

APPENDIX A

TDS SAMPLING PLAN

**Cherokee Metropolitan District
Implementation Plan (Compliance Order on Consent MC-140514-1)
TDS Sampling Schedule (January 16, 2015)**

Name	Location	Sample Frequency	Sample Type	Analytes	TDS Analysis Method
Water Supply					
Cherokee	Each Well (when in use)	1 x per month	Grab	TDS, Conductivity	Probe
		1 x per quarter	Grab	TDS, Conductivity	Gravimetric & Probe
	Well 13, 15	1 x per week	Grab	TDS, Conductivity	Probe
		1 x quarter	Grab	TDS, Conductivity	Gravimetric & Probe
	Ellicott Booster Station	1 x per week	Grab	TDS, Conductivity	Probe
		1 x quarter	Grab	TDS, Conductivity	Gravimetric & Probe
	Sand Creek Booster Station	1 x per week	Grab	TDS, Conductivity	Probe
		1 x quarter	Grab	TDS, Conductivity	Gravimetric & Probe
Wastewater Collection/Bulk User					
Cherokee	Downstream of CMD Headworks	3 x per month	Composite	TDS, Conductivity	Probe
		1 x per month	Composite	TDS, Conductivity	Gravimetric & Probe
Meridian	Meridian Lift Station Wet Well	3 x per month	Composite	TDS, Conductivity	Probe
		1 x per month	Composite	TDS, Conductivity	Gravimetric & Probe
SAFB (Base)	Upstream of CMD Interceptor	3 x per month	Composite	TDS, Conductivity	Probe
		1 x per month	Composite	TDS, Conductivity	Gravimetric & Probe
SAFB (Housing)	Upstream of CMD Interceptor	3 x per month	Composite	TDS, Conductivity	Probe
		1 x per month	Composite	TDS, Conductivity	Gravimetric & Probe
Water Reclamation Facility					
Influent Wastewater	Downstream of Parshall Flume	1 x per week	Grab	TDS, Conductivity	Probe
		1 x per month	Composite	TDS, Conductivity	Gravimetric & Probe
Effluent Wastewater	Downstream of UV Disinfection	1 x per week	Grab	TDS, Conductivity	Probe
		1 x per month	Composite	TDS, Conductivity	Gravimetric & Probe
RIB's					
Monitoring Wells 050-A and 050-B	Upstream of RIB's	1 x per month	Grab	TDS, Conductivity	Gravimetric
Monitoring Wells 050-C and 050-D	Downstream of RIB's	1 x per month	Grab	TDS, Conductivity	Gravimetric

APPENDIX B

OUTREACH PLAN

Cherokee Metropolitan District

Public Outreach and Involvement Plan

Water Reclamation Facility Compliance Feasibility Study

1. Introduction

Cherokee MD has developed this Public Outreach and Involvement Plan to describe how Cherokee MD will solicit public input, inform, and involve the customers, other districts, elected officials, and other stakeholders about the Water Reclamation Facility Compliance Feasibility Study.

Purpose and Goals of the Public Outreach and Involvement Plan

The purpose of this plan is to guide Cherokee MD and the project team on how to get input from the community on the Water Reclamation Facility Compliance Feasibility Study. This plan is subject to alteration and refinement by the District as more information becomes available.

The goals of the Public Outreach and Involvement Plan are to:

- Ensure input from the stakeholders
- Encourage informed input by providing understandable and accurate information
- Create multiple opportunities for the public to provide comments
- Inform the District's community about the project by using multiple means through which the public can learn about the project

2. Public Outreach before the Feasibility Outreach

The District will initiate several actions to involve and inform the public before the Feasibility Study Outreach. These initiatives are:

INFORMATION MATERIAL

Cherokee will develop different materials to explain the project and provide information on how to participate and comment. The materials can be fact sheets, frequently asked questions, and a dedicated newsletter. Due to the variety of customers, different materials and sources will be used in order to reach the stakeholders.

WEBSITE/FACEBOOK/TWITTER

The District will dedicate a special section of its website to the feasibility study topic. It will provide information about the project, public meetings summaries, comment form, and an email address for comments and questions. Information will be posted on the Facebook page. Through Twitter, updates will be announced.

STAKEHOLDER ANALYSIS

One of the first steps is identifying the stakeholders. Attachment A shows the identified stakeholders.

AGENCY MEETINGS AND ELECTED OFFICIALS MEETINGS

The District will have coordination meetings with CDPHE as needed. .

The Cherokee and MD Boards will be updated at their regular Board meetings as needed.

PROGRAM ON WATER SOFTENERS

Some homeowners in the Cherokee MD use water softeners. Employees in the field estimate that less than 10 percent of the homeowners have a softener. Unknown is how many of these softeners are actually used. A program has been developed to inform the homeowners of the negative consequences of using a water softener.

The program consists of three components. The first component is to provide the homeowners with information on the negative consequences. The second component is a water softener plumbing check. The third component is the District Board's action to prohibit water softeners in the District.

I. Information on water softeners:

- Articles in newsletters
- Information on Cherokee's site
- Handout information package on softeners to give to homeowners by Cherokee employees (in the field or if they call the office with questions or new homeowners)
- Information on Facebook

The information will be available through all of these channels to make sure that the information reaches the customers.

II. Water softener plumbing:

A free "Cherokee Water Softener Check" will be offered that will give a homeowner the opportunity to have the water softener plumbing and set up checked. A Cherokee employee will come by, check, and give advice. The employee will make no changes to the plumbing or the softener system.

III. Water softeners prohibited:

The Cherokee Metro District Board took action to prohibit water softeners in the District at their November 2014 Board meeting. Meridian Service Metro District's Board took that same action for their service area at their January 2015 Board meeting.

3. Public Outreach Feasibility Efforts

Instead of a public meeting at the District's office, public input will be gathered by going to specific locations throughout the District. This will encourage more public participation and input by making it easier for people to attend. This will take place in one day if possible.

The District will announce the meetings by several methods like social media, postcard, website, and newspaper notices. Before, during and after the meeting the public will be encouraged to comment.

OUTREACH EFFORTS

Specifics on the public meetings will be listed here.

COMMENT DATABASE

Comments will be solicited by:

- Comment forms at outreach events and at customer service at the District's office
- Online comment form
- Telephone
- Email account (email address of customer service will be used)
- Written letters

Cherokee's customer service will document and collect all comments in one database. The database will combine contact information (names, addresses, phone numbers, and e-mail addresses) and comments (by letter, e-mail, comment form, and/or phone) received from the public. All comments will be answered within five business days. The database is updated on a regular basis.

NEWSPAPER ARTICLE

Ranchland News

4. Specific actions and responsibilities

Attachment B outlines milestones, deliverables, and actions related to this Public Outreach and Involvement Plan. It indicates who is responsible for what, and by what date.

Attachment A: Overview of Key Audiences

Audiences

Group I: Direct Customers
Group II: Indirect Customers (through Meridian)
Group III: Influencers
Group IV: Possible interests

Group I:

Cherokee Metropolitan District
Meridian Service MD
Schriever Air Force Base

Group II:

Woodmen Hills MD
Falcon Highlands MD
Paint Brush Hills MD

Group III:

UBSCMD
Farmer Family
Ranchland News

Group IV:

Lower Fountain Water Quality Management
Association
PPACG Water Quality Management Committee
AFCURE
John Valentine (located south of UBSCMD)

Attachment B: Actions and Responsibilities

What	Who	When
Outreach planning	Manny Ortega Janie Lane Will Koger Dave Akers Sean Chambers Carla Schnitker	
1. Determine key messages.		
2. Determine strategy.		
3. Identify public outreach/ information.		
4. Develop list of deliverable and who's responsible.		
Compile list of audience/stakeholders		
See attachment A	Carla Schnitker	Done
Outreach pre-planning meetings		
Connect with key stakeholders of stakeholders groups I and II and discuss best ways to connect with their customers and get input on outreach plan.		Done
Information session Cherokee's customer service about project		
Public meetings		
Host two workshops to provide the public with information about the project and to solicit citizen input on concerns and issues		
Web page	Manny Ortega	
Develop special webpage and comment section		
Online event calendar		
Expert opinions associations/committees	Sean Chambers	
Solicit expert opinions from and engage: - Lower Fountain Water Quality Management Association - PPACG Water Quality Management Committee - AFCURE - Groundwater Quality Study Committee	Sean Chambers	Giving updates on a regular base at District's discretion.
Facebook and Twitter	Manny Ortega	
Information on project		
Project newsletter (Fact Sheet, FAQ)		
Develop project newsletter summarizing the project's purpose and activities. Includes timetable and scope of work.	Janie Lane	Newsletters addressed TDS-issue, project.

Comment database	Customer service	
Database with all comments that came in by phone, forms, site, Facebook		
Comment response process	Customer service	
Create list of answers for most common questions		
Establish formal process to coordinate and address comments.		
Information and listening sessions:		
Public outreach meetings with customers		
Meetings with specific audience:	Sean Chambers	
UBSCMD: inform and solicit feedback on specific topics		Several Board meetings have been attended to provide information and solicit comments.
Air Force Base: back wash cycles	Tyler Drennan	In progress.
Industry: Best Management Practices	Tyler Drennan	In progress.
Water softener users: Education program	Tyler Drennan	Program in place.
John Valentine:	Sean Chambers	Will engage in discussion as work progresses.
Farmer Family:	Sean Chambers, Brian Beaudette	Regular meetings as needed.
Media plan	Sean Chambers	
1. Press releases, public meetings		
2. Press releases specific about project		
3. Articles in Ranchland News		Drafted informative article for Ranchland news, December 2014