

From: Daniel Nix
Sent: Tue, 15 Jul 2014 10:08:50 -0500
To: David Sloan
Cc: Kerry D. Maroney; Russell Schreiber
Subject: Re: TCEQ Final Authorization for Blending
Attachments: PWS_2430001_CO_20140627_Exception_Cover Letter.pdf, Page 1_Enclosure A_20140627.pdf, Wichita Falls Letter 05-01-2014_Page 2 of 4.pdf, Wichita Falls Letter 05-01-2014_Page 3 of 25.pdf

David,

The only requirements the TCEQ have imposed upon us (to date) for extending past 6-months are to add UV and bury the pipeline. I have attached the UV requirements, below.

The first "Notice" that we received from TCEQ was their May 1, 2014 letter. It can be found on on page 2 (of 4) in their Cover Letter and on Page 3 (of 25) from their "Report Issues".

They then reiterated it on page 2 (of 4) of their cover letter and in page 1 of Enclosure A, all from their June 27, 2014 correspondence.

These are the only references I can find to their "requirements" for the UV disinfection. If you need anything else, let me know.

On Tue, Jul 15, 2014 at 9:41 AM, David Sloan <DWS@freese.com> wrote:

Hi Daniel: I'm trying to make sure I have all the requirements TCEQ has stated for extending the potable reuse operation beyond the current 6-month authorization, especially as it relates to the disinfection requirements. Can you please send me a copy of the final authorization or other correspondence which states the limitations?

Thank you,

DAVID W. SLOAN, P.E., BCEE

SENIOR PROCESS ENGINEER

BOARD CERTIFIED ENVIRONMENTAL ENGINEER



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Daniel K. Nix

Public Utilities Operations Manager

City of Wichita Falls

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Those who have the privilege to know have the duty to act. ~Albert Einstein



Texas Commission on Environmental Quality

Protecting Texas by Reducing and Preventing Pollution

June 27, 2014

Mr. Russell Schreiber, P.E., Director of Public Works
City of Wichita Falls
P.O. Box 1431
Wichita Falls, Texas 76307-1431

Re: City of Wichita Falls – PWS ID No. 2430001
Conditional Approval of Full-Scale Operation of the Temporary Direct Potable
Reuse Project for a Six-Month Duration
Wichita County, Texas
RN 600129316 | CN 105598759

Dear Mr. Schreiber,

On June 20, 2014, the Texas Commission on Environmental Quality (TCEQ) received your submittal dated June 18, 2014 entitled the “Full Scale Verification Test #2 Report for the Temporary Direct Potable Reuse Project” for the City of Wichita Falls (City). The submittal presents the results of the second full-scale verification test (FSVT2) of the direct potable reuse water treatment plant (DPR WTP) and requests approval to begin sending effluent from the City’s River Road Wastewater Treatment Plant (RRWWTP) that has been treated through the temporary DPR WTP to the City’s drinking water distribution system. We have organized our response to your submittal and discussion of other issues related to the operation of the Temporary DPR Project into the sections below.

Project Description

Because of the ongoing drought, the City proposes to supplement its water supply with the temporary reuse of wastewater effluent from the City’s RRWWTP as source water for the DPR WTP for a period of six months. The project proposes to utilize the existing Cypress Surface Water Treatment Plants (SWTPs) as a part of the Temporary DPR Project.

The treated wastewater from the RRWWTP will be delivered to the 2008 SWTP via a temporary pump skid located at the RRWWTP. From the temporary pump station, the treated wastewater will then be delivered to the Cypress site through approximately 12 miles of high density polyethylene temporary above-ground transmission line. The effluent will enter the Cypress treatment process through an existing flow control vault located prior to the 2008 SWTP microfiltration/reverse osmosis (MF/RO) clarifier. The 2008 MF/RO SWTP will treat the RRWWTP effluent. The treated water from the 2008 MF/RO SWTP will be blended with raw water from the Secondary Reservoir, which contains untreated surface water from Lake Arrowhead and Lake Kickapoo. A maximum of five (5.0) million gallons per day (MGD) partially-treated RRWWTP effluent from the 2008 MF/RO SWTP will be blended with the raw surface water from the Secondary Reservoir at a location upstream of the existing Cypress SWTP splitter box. The waters will be blended with a ratio of 50.00-percent or lower partially treated

RRWWTP effluent to Lake Arrowhead and Lake Kickapoo surface water. The blended water will then be treated through the existing conventional 2010 SWTP prior to entering the distribution system.

Review of FSVT2 Report

As documented in TCEQ's May 1, 2014 letter, due to significant deficiencies with the first full scale verification test (FSVT1), the TCEQ required the City to restart the verification test and demonstrate proper operation of the DPR WTP facility for 30 consecutive days. The City responded in a letter dated May 28, 2014. The City conducted the FSVT2 from May 16 to June 15, 2014. TCEQ staff provided on-site assistance to the City prior to the start of FSVT2, and also were on site for the first 18 days of the test.

TCEQ staff have completed review of the FSVT2 Report. A discussion of findings for which the TCEQ has specific comments is provided in Enclosure I. The information and data provided in the report support **conditional temporary approval of full-scale operation (FSO) of the Temporary DPR Project for a period not to exceed six months from the date of this letter.**

Conditional Approval of Full-Scale Operation of the Temporary DPR Project

The TCEQ **conditionally approves** FSO of the Temporary DPR Project for **a period not to exceed six months from the date of this letter.** This conditional approval is dependent on compliance with the requirements in Enclosure A. Failure to meet the requirements in Enclosure A will result in revision or revocation of this Temporary DPR Project conditional approval.

This conditional approval includes construction approval for reconnection of the Cypress facilities to the City's distribution system by reconnecting the 2010 SWTP transfer pumps to the 10 million gallon (MG) ground storage tank (GST).

Duration of the Temporary DPR Project

You have presented this project as a temporary, emergency response measure due to the extreme drought conditions that the City faces. The TCEQ evaluated this project as a temporary, emergency project, with a maximum duration of six months. However, information recently provided by the City indicates that you may wish to operate the Temporary DPR Project for more than six months.

In order for the TCEQ to consider approval of long-term use of the DPR Project (i.e. more than six months), the same standards will be applied to the City and the DPR Project as for other public water systems and DPR projects. These standards include installation of the water line carrying water from the RRWWTP to the Cypress SWTP to be below the ground surface per Title 30 of the Texas Administrative Code (30 TAC) Chapter 217.54. A standard for other DPR projects in Texas is the installation of ultraviolet (UV) light disinfection. Therefore, if this project is operated more than six months, UV light disinfection providing at least 3.0-log inactivation of *Cryptosporidium* must be approved and installed. Due to the amount of time required to plan for burying the pipeline and approval and installation of a UV light disinfection system, the TCEQ recommends that the City begin preparing for these measures now.

Current DPR WTP Regulatory Monitoring Locations, Frequency, and Action Levels

With this letter as Enclosure B is the current, updated figure depicting the TCEQ-required regulatory monitoring locations, frequency, and action levels for the Temporary DPR Project.

Revised CT Studies

Enclosed with this letter are two CT study approval letters for the 2010 SWTP and the temporary DPR WTP as Enclosures C and D. The City submitted a revision to the 2010 SWTP disinfection protocol because the plant is being used as part of the treatment sequence for the City's temporary DPR WTP and has been isolated from the 1961 and 1987 SWTPs at the Cypress site. The City submitted a proposed disinfection protocol for the temporary DPR WTP. The City must follow all requirements included in the CT study approval letters.

Revised Direct Integrity Test

Enclosed with this letter is a revised direct integrity test (DIT) approval letter for the parameters to be used for integrity testing of the MF membranes at the DPR WTP. A revision of the DIT approval was required due to a change in the surface area of the membrane modules discovered during review. The City must conduct DIT calculations in accordance with the requirements stated in the letter contained in Enclosure E.

Updated Use of Chloramines Exception

With this letter in Enclosure F is an updated exception approval for the use of chloramines. The TCEQ has made changes to the monitoring requirements for systems using chloramines, and in order to ensure consistency with current requirements, is providing this letter to the City. The City must follow all requirements included in the exception approval letter. Please note that the most significant changes in the updated exception are requirements for nitrate and nitrite distribution monitoring and for developing a nitrification action plan.

Industrial Contributions to the RR WWTP

In TCEQ's September 5, 2013 letter several suggestions about the industrial pretreatment program at the City was discussed. These suggestions have been placed in Enclosure H for your convenience.

Replacement of Reverse Osmosis Membrane Elements

On June 17, 2014, the TCEQ received your letter dated June 17, 2014, notifying us of the City's intent to replace the RO membrane elements in five RO trains. Because you propose to use membrane elements that are the same models as have been previously approved, the City will not be required to submit plans and specifications for the RO replacement project. Per discussion with City staff, the timeframe for replacement is summer 2014.

Replacement of Microfiltration Membrane Elements

On February 5, 2014, the TCEQ received your letter dated January 30, 2014 notifying us that the City had replaced the MF membrane elements in two MF units. The TCEQ received the challenge study for these MF membrane elements and has approved the study. The City will not be required to submit plans and specifications for the MF replacement project. In order to avoid future violations, please note the City is required by 30 Texas Administrative Code Chapter

Mr. Russell Schreiber, P.E.

Page 4 of 4

June 27, 2014

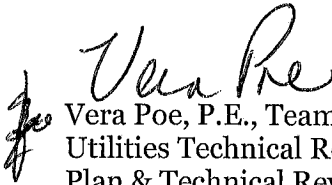
§290.39(j) requires notification of the TCEQ prior to making significant changes including membrane replacement.

If you have any questions regarding this letter, please contact Joel Klumpp at (512) 239-4453 or by e-mail at joel.klumpp@tceq.texas.gov or Vera Poe at (512) 239-6988 or by e-mail at vera.poe@tceq.texas.gov.

Sincerely,



Joel Klumpp, Team Leader
Technical Review and Oversight Team
Plan & Technical Review Section
Water Supply Division
Texas Commission on Environmental Quality



Vera Poe, P.E., Team Leader
Utilities Technical Review Team
Plan & Technical Review Section
Water Supply Division
Texas Commission on Environmental Quality



Linda Brookins, Director
Water Supply Division
Office of Water
Texas Commission on Environmental Quality

LB/JPK/VP/dfs

Enclosures

- Enclosure A: List of Conditions for the Temporary DPR WTP
- Enclosure B: Current DPR WTP Regulatory Monitoring Locations, Frequency, and Action Levels
- Enclosure C: CT Study Letter for the Cypress 2010 Water Treatment Plant
- Enclosure D: CT Study Letter for the Cypress Temporary DPR Water Treatment Plant
- Enclosure E: Revised Direct Integrity Test Letter
- Enclosure F: Updated Use of Chloramines Exception Letter
- Enclosure G: Unregulated Contaminants of Concern
- Enclosure H: Industrial Contributions to the RR WWTP
- Enclosure I: FSVT2 Discussion
- Enclosure J: Cypress WTP 10 Million Gallon Ground Storage Tank Sample Analysis

cc: Honorable Glenn Barham, Mayor, City of Wichita Falls, P.O. Box 1431, Wichita Falls, TX 76307-1431
Mr. Darron Leiker, City Manager, 1300 7th Street, Wichita Falls, TX 76301
City of Wichita Falls - Attn.: Daniel K. Nix, Utilities Operations Manager, P.O. Box 1431, Wichita Falls, Texas 76307-1431

Enclosure A
List of Conditions, June 27, 2014
City of Wichita Falls - PWS 2430001
Temporary Direct Potable Reuse WTP - 410791

Due to the ongoing drought, the City of Wichita Falls (City) proposes to augment its water supply with the temporary reuse of wastewater effluent from the City of Wichita Falls River Road Wastewater Treatment Plant (RRWWTP) as source water for the Temporary Direct Potable Reuse (DPR) Water Treatment Plant (WTP) for a period of six months. The project proposes to utilize the existing Cypress Surface Water Treatment Plants (SWTPs) as a part of the temporary DPR WTP project.

As stated in TCEQ's May 1, 2014 letter, if the City determines that the temporary DPR WTP will be needed for longer than six months; the burial of the above ground pipeline and approval, installation, and use of additional treatment barriers will be required. The maximum duration the project can be operated is six months unless UV disinfection providing at least 3.0-log inactivation of *Cryptosporidium* is approved and installed.

EXCEPTIONS

1. The proposed use of RRWWTP effluent as a raw water source and the associated treatment processes for a DPR WTP require exceptions to Title 30 of the Texas Administrative Code (30 TAC) Chapter 290, Subchapter D regulations. The TCEQ staff review requests for exceptions to ensure that a public water system will provide a safe quality and adequate quantity of drinking water to their customers as required by the Texas Health and Safety Code (THSC) §341.0315(a).

The conditional granting of the temporary exceptions is **valid for a period of 6 months from the date of this letter**. Below are listed the City's temporary exceptions granted for 6 months of temporary DPR WTP use to produce potable drinking water for public user:

- a. The use of RRWWTP effluent in lieu of groundwater or surface water as a source of water for a public water system [30 TAC §290.41];
- b. The use of the temporary DPR WTP equipment and piping in the proposed configuration which includes common walls between areas carrying water in prior stages of treatment [30 TAC §290.42(d)(2)];
- c. The use of pre-formed chloramines as a pre-disinfectant [30 TAC §290.42(e)(3)(G)];
- d. The use of chloramines for inactivation credit [30 TAC §290.42(e)(3)(G)];
- e. Micro Filtration (MF) membranes for removal of pathogens [30 TAC §290.42(g)(3)];
- f. Reverse Osmosis (RO) membranes for the removal of primary and secondary drinking water chemical contaminants [30 TAC §290.42(g)]; and
- g. Post-RO membrane pH adjustment [30 TAC §290.42(g)].

monitor at the sample sites from a TCEQ-approved Full-Scale Operation Monitoring Plan, show that all microfiltration membranes can be operated without elevated turbidity readings, demonstrate daily direct integrity testing, and demonstrate the successful operation of all processes. TCEQ personnel can be available on-site May 16 – June 2, 2014 to observe the beginning of the FSVT 2. After the first 18 days, the City must continue the FSVT 2 for an additional 12 days before completing the test, compiling the necessary data, and submitting the FSVT2 report to the TCEQ for review.

Duration of the Emergency DPR Project

The TCEQ understands the City's challenges due to the current drought's impact on its source water supply. Information provided by the City indicates that, if approved, the City may operate the Emergency DPR Project for a duration longer than six months. As documented in previous correspondence to you from the TCEQ, additional treatment barriers may be required for long-term operation of the DPR Project. Due to the amount of time required to plan for additional barriers, the TCEQ is hereby notifying you that if this project is approved for distribution to the public, **the maximum duration it can be operated is six months unless UV disinfection providing at least 3-0 log inactivation of *Cryptosporidium* is approved and installed.**

Revised Minimum Treatment Requirement for *Giardia*

The maximum concentration of *Giardia* found in the wastewater effluent during the FSVT was an order of magnitude higher than the concentration observed in other results provided to the TCEQ. This indicates that the level of *Giardia* under normal operations is higher than expected and that the facility will need to provide more treatment than TCEQ first believed.

The level of treatment provided during the FSVT was adequate for this normal level of treatment but more treatment may be needed if an outbreak of *Giardia* occurs. The City did not address the higher level of *Giardia* or treatment needs in the Report. **The TCEQ is revising the minimum specified level of treatment for *Giardia* from 7.0-log removal/inactivation to 8.0-log removal/inactivation.** The Report indicated that the City achieved at least 10.1-log removal/inactivation of *Giardia*, so sufficient log removal/inactivation may be achieved

Loss of Flux in Microfiltration Membranes

Based on our review of the information provided in the Report, the TCEQ is concerned about the lifespan of the MF membrane modules and what that means to the overall operation. Shortened membrane life will impact either the life cycle cost of the DPR Project or the ability to maintain the output of the plant. It appears that the clean-in-place procedure did not recover the specific flux to near the level at the beginning of the FSVT. The Report did not discuss full-scale cleaning methods or the potential shortened life span of the membrane units. Please see the enclosure for additional information on this topic.

A. General Consistency of Documents

Taken together, the Standard Operating Procedures (SOPs), Operations and Maintenance (O&M) Manual, CT study (disinfection protocol), Monitoring Plan, Shutdowns and Alarms list, and notification documentation show the operators how to run the plant and identify the key control points to assure safe water is produced by the plant. These documents represent the operational readiness of Wichita Falls to operate the direct potable reuse (DPR) plant for six months. The TCEQ found many inconsistencies in the documents provided by the City of Wichita Falls. Without accurate documents and instructions, the plant personnel do not have the tools they need to respond to the failure of a key control point.

The City should cross-check the various documents and update them to be internally consistent. Specific inconsistencies are described below.

B. Log Removal and Inactivation

B.1. Requirement for Additional Measures

In TCEQ's September 5, 2013 letter, we requested results from a real time microbial monitoring method with the caveat that if the real time method was not useful as an indicator of pathogen rule, additional measures would have to be implemented.

The assumption that a polymerase chain reaction (PCR) result of zero indicates the absence of human pathogens has not been scientifically validated. The more robust methods (EPA Method 1623 for cysts/oocysts and EPA Method 1615 for viruses) must be sent off site, so results cannot be seen for several weeks, which is too long for an immediate response. Without a reliable method, the City would not be prepared for a waterborne disease outbreak. Continuous, reliable confirmation of treatment efficacy must be used to demonstrate pathogen removal and inactivation. The City intermittently demonstrated that the DPR treatment process has the capability to remove and inactivate bacteria (*E. coli*), *Cryptosporidium*, *Giardia*, and viruses; but this capability must be implemented continuously and demonstrated daily to protect public health. Therefore, the City must perform the monitoring described herein for full-scale operation (FSO).

The TCEQ has reviewed the level of removal and inactivation necessary to ensure public health protection. Based on the concerns regarding the City's ability to provide safe and adequate water reliably over an extended period of time, if the City operates the DPR for more than six months, it may only do so after adding an additional, redundant barrier for *Cryptosporidium*. By adding this additional barrier, the City will be assured of its ability to provide water if a treatment unit becomes nonfunctional. **Without a redundant barrier, the entire plant must be shut down if any process has a problem.** The additional barrier must achieve 3-log inactivation of *Cryptosporidium*, in order to ensure full redundancy. Ultraviolet disinfection is an acceptable redundant barrier.