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PWS/0000001/CO



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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

March 14, 2011

Mr. Ignacio Cadena, P.E.
Freese and Nichols, Inc.
4055 International Plaza, Suite 200
Fort Worth, Texas 76109

Re: Colorado River Municipal Water District (CRMWD)
Public Water System ID No. 0000001
Proposed Big Spring Regional Water Reclamation Project
Plan Review Log Number P-01182011-205
Howard County, Texas

PWS 1140038

RN105692891; CN602515967

Dear Mr. Cadena:

On January 18, 2011, the Texas Commission on Environmental Quality (TCEQ) received planning material with your letter dated January 18, 2011 for the proposed Big Spring Regional Water Reclamation Project has been reviewed. Based on our review, the project generally meets the minimum requirements of the TCEQ's Chapter 290 - Rules and Regulations for Public Water Systems (Rules) and is **conditionally approved for construction** if the project plans and specifications meet the following requirements:

1. CRMWD shall ensure that the requirements listed in our letter, dated November 30, 2010, for using Pall's Microza® UNA-620A hollow fiber micro filtration (HF MF) membranes followed by Toray TML Reverse Osmosis (RO) Membrane are met. TCEQ will allow a maximum capacity for the HF MF membranes of 2.5 million gallons per day (MGD) design; **17,959 gallons per day (GPD)** for a 538 square feet (ft²) membrane module at an average **filtrate flux rate of 37.2 gallons per square feet per day (gfd)** at 20°C for a total HF MF membranes plant capacity of **2.5 MGD for 140 membrane modules**. TCEQ will allow a maximum capacity of a 1.8 MGD for the RO; 2,400 ft² per vessel; 72 vessels; 400 ft² membranes elements at an average **filtrate flux rate of 10.5 gfd** at 20°C for a **total plant capacity of 1.8 MGD for 648 membrane elements in a 2-1 array**. The exception requirements and the following requirements shall be met:
 - A. A signed and dated performance guarantee from Pall Corporation must be provided to the Utilities Technical Review Team, MC-159, in accordance with 30 Texas Administrative Code (TAC) §290.42(g).
 - B. Operators will be required to monitor each membrane unit according to the TCEQ Guidance titled Monitoring, Operating and Report Requirements for Membrane Installations.

- C. All chemicals and any process media used in treatment of water supplied by public water systems must conform to American National Standards Institute/National Sanitation Foundation (ANSI/NSF) Standard 60 for direct additives and ANSI/NSF Standard 61 for indirect additives. Conformance with these standards must be obtained by certification of the product by an organization accredited by ANSI [30 TAC §290.42(I)].
 - D. Membrane systems must be designed so that membrane units' feed water, filtrate, backwash supply, waste and chemical cleaning piping have cross-connection protection to prevent chemicals from all chemical cleaning processes from contaminating other membrane units in other modes of operation. This may be accomplished by the installation of a double block and bleed valving arrangement, a removable spool system or other alternative methods approved by the executive director [30 TAC §290.42(g)(3)(F)].
2. The membrane system must be designed to conduct and record continuous indirect integrity monitoring on each membrane unit. The turbidity of the water produced by each membrane unit must be measured using the Hach FilterTrak Method 10133. The executive director may approve the use of alternative technology to monitor the quality of the water produced by each membrane unit [30 TAC §290.42(g)(3)(C)].
 3. Safety equipment and training programs for all chemicals used in water treatment shall meet applicable standards established by the Occupational Safety and Health Administration (OSHA) or the Texas Hazard Communications Act, Health and Safety Code, Chapter 502 [30 TAC §290.42(k)(1)].
 4. All newly installed coatings having contact with potable water must conform to **ANSI/NSF Standard 61** and must be certified by an organization accredited by ANSI [30 TAC §290.43(c)(8)].
 5. The TCEQ will not issue approval for discharge of CRMWD reclamation facility into the CRMWD raw water pipeline until after chemical analytical results are received from the TCEQ contract laboratory. After receiving notification of completion of construction, the TCEQ will schedule a contractor to collect the necessary samples at the required sample tap located on the reclamation facility discharge to the CRMWD raw water pipeline or the product tank, if all the treated water enters the product tank and no treatment or chemical addition occurs after the product tank. These samples will be analyzed for the required minerals and metal constituents. They will be analyzed for certain organic chemicals such as volatile compound and pesticides. Based on the results of these analyses, the required sampling frequency and constituents analyzed for any receiving PWSs' points of entries to distribution systems may be modified.
 6. The concentrate from the RO system is proposed to discharge to Beal's Creek via a new outfall which will require a discharge permit. Wastewater disposal is not included in this review.

The submittal consisted of 154 sheets of engineering drawings and technical specifications. The approved project consists of:

- Source water pump station with four pumps; three 900 gallons per minute (gpm) each @ 30 feet total dynamic head (t.d.h.) and one 200 gpm @ 20 feet t.d.h.;
- Pre-treatment consists of a 300 micron strainer;
- Pall Microza® Model UNA-620A HF MF membrane modules, each six inches in diameter, approximately 80 inches (in) in length, containing polyvinylidene fluoride (PVDF) fibers with a membrane fiber nominal pore size of 0.1 microns, a total feed side surface area of 538-square feet (sf); an average instantaneous filtrate flux rate of 37.2 gallons per square foot per day (gfd) (temperature corrected to 20° C); a net filtrate of 17,959 GPD per a 538-sf module at 20° C; 140 Pall UNA-620A HF membrane modules for a 2.5 MGD capacity.
- HF MF membrane includes clean in place system with caustic, citric acid and sodium hypochlorite supplies, feed and disposal systems; air assisted backwash systems;
- Two Cartridge filters;
- Toray TML Reverse Osmosis (RO) Membrane, two-stage 2:1 array, an average flux rate of 10.5 gfd for the Toray TML 10 RO membrane element's feed side surface area of each array. Each membrane element is 8-inch diameter, active membrane area of 400 ft², leaf length of 40 inches; Two trains each with 36 membrane vessels, 86,000 ft² per train; 2,400 ft² per vessel; minimum of 75 percent recovery; for a total capacity of 1.8 MGD;
- Three AWWA D103 Bolted glass fused steel water storage tank; One Product Water 0.50 MG one 1.0 MG Source Water Tank; one 0.07 MG Break Tank;
- As an alternate to two of the above tanks, two AWWA D110 Prestressed, Wire-Wound, Circular ground storage tanks including one 1.0 MG Source Water Tank; one 0.07 MG Break Tank;
- Chemical feed system including metering pumps, one 5,500 gallon HDPE double-walled, bulk storage tank for **hydrogen peroxide** for injection prior to Ultraviolet disinfection and oxidation system, one 5,000 gallon PE bulk storage tank and two PE day tanks (one 100 gallon and one 200 gallon) for **sodium bisulfite**, one 5,000 gallon PE bulk storage tank and one 100 gallon PE day tank for **sulfuric acid**;
- Ultraviolet disinfection and oxidation system consisting of two low-pressure, high intensity Trojan reactors with a total capacity of 1.78 MGD and minimum of 1.0 MGD to treat 50 % of flow from the RO membranes; hydraulically capable of 100% of flow; capable of 1,4 dioxane reduction of 1.2 log₁₀ and NDMA reduction of 0.5 log₁₀. The system will be validated with similar reuse application and an on-site acceptance test;
- Product water pump station with three 660 gpm each @ 260 feet t.d.h. vertical turbine pumps;

This approval is for the construction of the above listed items only. Any wastewater components contained in this design were not considered.

An appointed engineer must notify the TCEQ's Region Office 7 in Midland at 432-570-1359 when construction will start. Please keep in mind that upon completion of the water works project, the engineer or owner will notify the commission's Water Supply Division, in writing, as to its completion and attest to the fact that the work has been completed essentially according to the plans and change orders on file with the commission as required in §290.39(h)(3) of the Rules.

Please refer to the Utilities Technical Review Team's Log No. P-01182011-205 in all correspondence for this project. This will help complete our review and prevent it from being considered a new project.

Mr. Ignacio Cadena, P.E.

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Please complete a copy of the most current Public Water System Plan Review Submittal form for any future submittal to TCEQ. Every blank on the form must be completed to minimize any delays in review of your project. The document is available on our WEB site at the address shown below.

<http://www.tceq.state.tx.us/assets/public/permitting/watersupply/ud/forms/10233.pdf>

For future reference, you can review part of the Utilities Technical Review Team's database to see if we have received your project. This is available on the TCEQ's homepage on the Internet at the following address:

http://www.tceq.state.tx.us/permitting/water_supply/ud/planrev.html

You can download most of the well construction checklists and the latest revision of Chapter 290 "Rules and Regulations for Public Water Systems" from this site.

If you have any questions please contact Deborah Helstrom at 512-239-6705 or by email at "Deborah.Helstrom@tceq.texas.gov" or by correspondence at the following address:

Utilities Technical Review Team, MC-159
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

Sincerely,



Deborah Helstrom, P.E.
Utilities Technical Review Team, MC-159
Plan and Groundwater Review Section
Water Supply Division
Texas Commission on Environmental Quality



Ada Lichaa, P.G., Manager
Plan and Groundwater Review Section
Water Supply Division
Texas Commission on Environmental Quality

DH/sg

cc: Mr. John Grant, General Manager, Colorado River Municipal Water District, PO Box 869, Big Spring, TX 79721-0869
TCEQ Central Records PWS File 0000001
TCEQ Region No. 7 Midland Office - (w/approved materials)