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Director

State of California—Health and Human Services Agency
California Department of Public Health



ARNOLD SCHWARZENEGGER
Governor

January 24, 2008

System No. 1090014

Mr. Matt Scroggins, P.E.
California Regional Water Quality Control Board
Central Valley Region – Fresno Branch Office
1685 E. Street
Fresno, CA 93706

Dear Mr. Scroggins:

RE: Tentative Waste Discharge Requirements and Master Reclamation Permit (NPDES No. CA0085235) for City of Clovis Sewage Treatment and Water Reuse Facility – Fresno County

The purpose of this letter is to acknowledge receipt of the Tentative Waste Discharge Requirements (TWDR) for the City of Clovis' Sewage Treatment and Water Reuse Facility and to provide comments on the subject document. Our office has completed a review of the Tentative Waste Discharge Requirements and has the following comments:

1. Page 32, Subsection b: The TWDR indicates the "wastewater shall be oxidized, coagulated, filtered, and adequately disinfected as specified in Title 22, CCR, Division 4, Chapter 3, or the equivalent." Although this is not an issue that is addressed by the California Department of Public Health (CDPH), is a coagulant going to be added between the secondary process and the membranes?
2. Page 34, iv: The TDWR indicates: "The specific use to be made of the recycled water, the use site acreage, the type of vegetation/crops to which the recycled water will be applied, and the anticipated volume of recycled water to be used" must be provided at least 30 days prior to conveying recycled water to a new use site. This section could be modified to: "...the type of vegetation/crops or other types of reuses..." since the City may expand the program for uses such as dual plumbing.
3. Page E-3, Table E-3: Table E-3 requires coliform monitoring five days a week. This requirement must be changed to seven days per week as required by Title 22, CCR, Division 4.
4. Page E-8, Section B – 1: This section requires the discharger to submit a quarterly (1/quarter) recycled water users' summary report containing information on the total

volume of recycled water supplied to all recycled water users during the quarter, the total number of recycled water use sites, and a map showing the locations of the recycled water use sites. The TWDR does not specify who the report is to be submitted to but it is assumed that it will be submitted to the RWQCB. CDPH would like to receive a copy of this report for our records as well.

5. Based on correspondence from the City and FID, it is our understanding that an agreement between the City and FID is being developed and will include provisions that address the need to maintain the City's discharge of treated wastewater at a level that is approximately 5 percent of the flow within Fancher Creek and/or its associated canals and basins, as determined on an annual basis. To make the annual determination, the agreement needs to contain provisions related to flow information and data sharing between the City and FID. CDPH would also like to receive flow data for the portion of the FID canal system that receives treated wastewater. A copy of the executed agreement will be provided to CDPH for informational purposes. Based on this information, the previous concerns expressed by CDPH have been resolved to our satisfaction.

The Ultraviolet Disinfection System is discussed in Section VI.C.4.b (Page 28 and 29 of the TWDR's). The UV Disinfection System is also referenced in Attachment F, Page F-48 and F-49. Based on the "LBX 1000 UV Disinfection System Validation Report: (Carollo Engineers, December 2007), CDPH recommends the following changes (in bold) be made to the UV requirements mentioned in Section VI.C.4.b:

- i. The Discharger shall provide continuous, reliable monitoring of flow, UV transmittance, **UV intensity, UV dose, UV power, and turbidity.**
- ii. The Discharger shall operate the UV disinfection system to provide a minimum UV dose of 80 millijoules per square centimeter (mJ/cm²) at **all times**, unless otherwise approved by CDPH.
- iii. The UV transmittance (at 254 nanometers) in the wastewater shall not fall below **54** percent of maximum at any time.
- iv. No Change
- v. No Change
- vi. **Lamps must be replaced after they have reached 10,000 hours of operation**, or sooner, if there are indications the lamps are failing to provide adequate disinfection. Lamp age and lamp replacement records must be maintained.
- vii. **To verify performance of the Clovis ST-WRF, upon completion of construction and prior to operation, an on-site check-point bioassay must be performed on the UV reactor using seeded MS2 coliphage in a method similar to that demonstrated in the 2007 validation report (Carollo Engineers, December 2007). The on-site bioassay protocol must be approved by CDPH and must be conducted over a range of flows. Results, documenting virus disinfection performance of the UV system to the standards found in Title 22 of the CCR, must be submitted to CDPH for approval.**
- viii. **Once the on-site check-point bioassay is performed at the Clovis ST-WRF, the results can either verify or modify the following two empirical equations developed based on the performance data collected during the Portland validation test to be used for calculation of the RED value. These verified/modified equations are to be used as part of the**

automatic UV disinfection control system for calculating UV dose and should be specified as a permit provision.

$$S = e^{-7.919} \times e^{0.0367 \text{ UVT}} \times P^{1.229}$$

$$\text{RED}_{\text{calc}} = 10^{1.2771} \times A_{254}^{-0.9793} \times [S/S_0]^{0.8751} \times [1/Q]^{0.9036} \times B$$

Where:

S = Measured UV sensor value (mW/cm²).

S₀ = UV intensity at 100 percent lamp power (new lamps) with clean sleeves, typically expressed as a function of UVT (mW/cm²).

P = Power setting, either 210 W, 270 W, or 330 W for the witnessed tests

RED = RED calculated with the UV dose-monitoring equation (mJ/cm²).

A₂₅₄ = UV absorbance at 254 nm (cm⁻¹).

Q = Flow rate (million gallons per day [MGD]).

B = Number of operating banks of lamps within the UV reactor.

- ix. A single LBX 1000 reactor is limited to the following parameter ranges:
 - a. from 0.58 to 3.51 MGD (403 to 2,438 gpm)
 - b. UVTs at or above 54 percent¹
 - c. UV sensor intensities ranging from 1.9 to 7.5 mW/cm².
- x. If more than one reactor is used at a time, each reactor must be individually monitored and controlled by the SCADA system based upon operational parameters unique to each reactor.
- xi. The control logic for each LBX 1000 UV disinfection reactor must include the following:
 - a. On-line monitoring of flow, UV transmittance, UV intensity, UV dose, UV power, and turbidity must be provided at all times.
 - b. The final approved RED and S equations developed must be incorporated into the process logic controller and at no time should the UV delivered dose fall below 80 mJ/cm².
 - c. UV transmittance (254 nm) in the wastewater entering the UV system shall never fall below 54%. Should the UV transmittance fall below 54%, the water must not be used at recycled use sites.
 - d. The flow to each reactor must be controlled such that the flow per reactor shall not exceed to 3.51 MGD (2,438 gpm), nor shall the flow fall below 0.58 MGD (403 gpm).
 - e. The power setting on any UV bank or lamp in operation must not fall below 210 W.
 - f. UV sensor intensity must not fall below 1.9 mW/cm².

¹ At UVT values above 77 percent, the value (77 percent UVT, or A₂₅₄=0.114) must be used as the default value in the RED calculation.

- g. The LBX 1000 UV system is designed with a built-in automatic reliability feature that must be triggered when the system is below the target UV dose. If the measured UV intensity goes below the minimum UV intensity, the UV reactor in question must alarm and start the next available reactor.**
- h. The LBX 1000 UV disinfection system must use a calibrated germicidal sensor that meets international standards (DVGW, 2006; ÖNORM, 2001) and is integral to the performance monitoring of the system.**
- i. Lamp age and fouling factors are replaced by using the calibrated germicidal sensor. The LBX 1000 uses Wedeco's XLR30 UV lamps. These lamps have been tested and approved by CDPH for an end of lamp life (EOLL) factor of 0.88 over 10,074 hours of operation²². However, the validation report does not address the determination of lamp aging or lamp fouling factors. Instead, this validation is based upon dose-pacing methodology, relying on detailed and accurate UV sensor readings to confirm adequate UV dose delivery similar to drinking water UV applications, so that the regulated UV dose is delivered and the combined effects of lamp aging and sleeve fouling are incorporated. Detailed information related to the UV sensors to be employed under this project is presented in Appendix A in the 2007 report from Carollo Engineers.**
- j. Conditions that must shut a reactor down include:**
- low UVT**
 - low UV sensor intensity**
 - intensity monitor failure,**
 - high flow,**
 - low flow,**
 - reactor failure,**
 - multiple lamp failure, and**
 - ballast high temperature**
- xii. The accuracy and repeatability of the on-line UV transmittance and intensity sensors must be demonstrated to CDPH. The site specific engineering report must specify the frequency that verification and calibration checks should be performed.**
- xiii. The UV disinfection system and records must be reviewed and inspected at a frequency determined by the RWQCB.**
- xiv. The UV disinfection system must be operated in accordance with an approved operations plan. An operations and maintenance plan (detailing how compliance with the NWRI guidelines will be assured at all times) must be developed and on file with the RWQCB and CDPH.**

²² The lamp testing results are documented in "10,074-Hour Lamp Aging Report – SLR 32143 HP Lamp, Final, May 2005", by Carollo Engineers

If you have any questions regarding this matter, please contact Kassy Chauhan or me at (559) 447-3300.

Sincerely,



Carl L. Carlucci, P.E.
Senior Sanitary Engineer
Merced District
SOUTHERN CALIFORNIA BRANCH
DRINKING WATER FIELD OPERATIONS

cc: Mr. Steve White, P.E. – City of Clovis
Mr. Brian Bernados – San Diego District Office – Drinking Water Program
Mr. Jeff Stone – Santa Barbara Office – Drinking Water Program
Fresno County Human Services System

Clc/kdc