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August 4, 2009

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

ORDER WQ 2009-

In the Matter of the Petition of
CALIFORNIA SPORTFISHING PROTECTION ALLIANCE

Waste Discharge Requirements Order No. R5-2008-0162 [NPDES No. CA 0084727] for the
Tuolumne Utilities District, Sonora Regional Wastewater Treatment Plant, and Jamestown
Sanitary District Jamestown Wastewater Treatment Plant, Tuolumne County

Issued by the
California Regional Water Quality Control Board,
Central Valley Region

SWRCB/OCC FILE A-1967

BY THE BOARD:

In this Order, the State Water Resources Control Board (State Water Board) remands Waste Discharge Requirements (WDRs) Order No. R5-2008-0162 [NPDES No. CA 0084727] (the 2008 Permit), which the Central Valley Regional Water Quality Control Board (Central Valley Water Board) adopted on October 24, 2008. The 2008 Permit regulates seasonal surface water discharges from wastewater treatment plants owned and operated by the Tuolumne Utilities District (TUD) and the Jamestown Sanitary District (JSD). It is a renewal of previous WDRs that the Central Valley Water Board issued on March 15, 2001 (Order No. 5-01-043; the 2001 Permit). On November 23, 2008, the California Sportfishing Protection Alliance (CALSPA) filed a timely petition requesting the State Water Board to review and vacate the 2008 Permit. This Order addresses a single issue raised in the petition; the effluent limitations for the discharge of chlorine residual.¹ Based upon the record before the Central Valley Water Board and a technical review conducted by the Division of Water Quality, we conclude that the 2008 Permit should be remanded to the Central Valley Water Board for reconsideration and revisions consistent with this Order.

¹ To the extent CALSPA raised issues not discussed in this Order, such issues are hereby dismissed as not substantial or appropriate for review by the State Water Board. (See *People v. Barry* (1987) 194 Cal.App.3d 158, 175-177, *Johnson v. State Water Resources Control Bd.* (2004) 123 Cal.App.4th 1107, Cal. Code Regs., tit. 23, § 2052, subd. (a)(1).)

I. BACKGROUND

The TUD owns and operates the Sonora Regional Wastewater Treatment Plant (SRWTP) and associated wastewater collection and disposal system, which provides sewer services to approximately 25,000 people. The SRWTP has a design capacity of 2.6 million gallons per day and produces secondary treated and disinfected effluent that is discharged to Quartz Reservoir, a 1,200 acre-foot constructed storage lagoon.² The JSD owns and operates the JSD Wastewater Treatment Plant (JWTP), which provides sewer services to approximately 3,000 people. JWTP has a design capacity of 0.2 million gallons per day and JSD has contracted with TUD to discharge its secondary treated and disinfected effluent to Quartz Reservoir.

Both TUD and JSD use chlorine to disinfect their effluent. Unlike most wastewater treatment plants, however, neither plant dechlorinates the disinfected effluent. Instead, the chlorine is expected to naturally dissipate through oxidation while the wastewater is stored in Quartz Reservoir. From May 16 through November 30 of each year, stored wastewater is used for irrigation of agricultural lands.³ When rain causes Quartz Reservoir to overflow, the wastewater is discharged into Woods Creek, a water of the United States. The 2008 Permit authorizes wet weather discharges into Woods Creek from December 1 through May 15, when flows in Woods Creek provide at least a 20:1 dilution ratio. Beneficial uses of Woods Creek downstream of the discharge point include commercial and sport fishing, aquaculture, warm freshwater habitat, cold freshwater habitat, and wildlife habitat.

II. CONTENTION AND FINDINGS

Contention: CALSPA contends that the 2008 Permit contains effluent limitations for chlorine residual that are less stringent than the 2001 Permit, in violation of the anti-backsliding requirements of the Clean Water Act.

Findings: We agree that the effluent limitations for chlorine residual are inappropriate and conclude that Order No. R5-2008-0162 must be remanded to the Central Valley Water Board for two reasons: The 2008 Permit's chlorine residual effluent limitations (1) constitute backsliding because they are less stringent than those set forth in the 2001 Permit, and do not

² The Central Valley Water Board concluded that Quartz Reservoir is not a water of the United States. The Central Valley Water Board explains that Quartz Reservoir "is a constructed effluent storage lagoon, not a drinking water reservoir or an impoundment of a natural waterbody." (Central Valley Water Board Response to Petition, Feb. 9, 2009, at p. 2 n. 1; see also 40 C.F.R. § 122.2 ["Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA . . . are not waters of the United States."].)

³ The discharges to agricultural lands and reclamation system are regulated under separate WDRs, Central Valley Water Board Order Nos. R5-94-192 and R5-2002-0202, respectively.

qualify for an exception to the anti-backsliding rule; and (2) pose a real danger to aquatic life in Woods Creek, and therefore do not protect beneficial uses. We will address these issues below.

A. Anti-backsliding

The Clean Water Act prevents a permitting agency from relaxing water quality-based effluent limitations in renewed or reissued NPDES permits, except under very limited circumstances. This federal rule is known as anti-backsliding, and is set forth in Clean Water Act section 402(o)(1): "[A] permit may not be renewed, reissued, or modified to contain effluent limits which are less stringent than the comparable effluent limitations in the previous permit"⁴ Section 402(o)(2) provides the following exceptions to anti-backsliding:

- A. Material and substantial alterations or additions to the permitted facility occurred after permit issuance which justify the application of a less stringent effluent limitation;
- B. Information is available which was not available at the time of permit issuance . . . and which would have justified the application of a less stringent effluent limitation at the time of permit issuance;
- C. A less stringent effluent limitation is necessary because of events over which the permittee has no control and for which there is no reasonably available remedy; . . . or
- D. The permittee has installed the treatment facilities required to meet the effluent limitations in the previous permit and has properly operated and maintained the facilities but has nevertheless been unable to achieve the previous effluent limitations⁵

Even if one of the exceptions does apply, however, backsliding of an effluent limitation is still prohibited if the less stringent effluent limitation either (1) violates applicable effluent limitation guidelines, or (2) violates water quality standards.⁶

The 2001 Permit contained one-hour and four-day average effluent limitations for chlorine residual of 0.019 mg/L and 0.011 mg/L, respectively. These effluent limitations are identical to the U.S. EPA's National Recommended Ambient Water Quality Criteria for

⁴ 33 U.S.C. § 1342(o)(1).

⁵ *Id.*, § 1342(o)(2). The federal rule also allows relaxation of water quality-based limitations if the requirements of Clean Water Act section 303(d)(4) are met. This section establishes different criteria for relaxation, depending on whether the receiving waters are in attainment with the applicable water quality standards. (*Id.*, § 1313(d)(4).)

⁶ 33 U.S.C. § 1342(o)(3).

protection of freshwater aquatic life,⁷ and they implement the narrative toxicity objective in the Basin Plan. The 2008 Permit replaces the one-hour and four-day average criteria with the following limitations: a 0.02 mg/L maximum daily effluent limitation (MDEL) and a 0.01 mg/L average monthly effluent limitation (AMEL).⁸ The Central Valley Water Board explains that it used the U.S. EPA's *Technical Support Document for Water Quality-Based Toxics Control* (TSD) procedures to convert the U.S. EPA's recommended criteria into the MDEL and AMEL.⁹

CALSPA contends that the 0.02 mg/L MDEL and 0.01 mg/L AMEL are less stringent than the 2001 Permit's one-hour and four-day average limitations.¹⁰ The Central Valley Water Board responds that the change in chlorine residual effluent limits and averaging periods does not constitute backsliding.¹¹ It asserts that "the concentrations of the limits have not changed, the limits are equivalent since both are based on the [U.S. EPA's] recommended criteria, and the [2001 Permit] required the same sampling frequency for compliance."¹² The board further responds that the effluent is stored in a 1,200 acre-foot reservoir for a minimum of four months, and any residual chlorine is therefore likely to dissipate or oxidize before the effluent is discharged into Woods Creek.¹³ Consequently, it avers, "continuous monitoring is not appropriate for this discharge, because *the threat of a chlorine release has not been shown based on monitoring data in the record, and, therefore, the threat of such a discharge is negligible.*"¹⁴

Contrary to the Central Valley Water Board's assertion that "the threat of a chlorine release has not been shown based on monitoring data in the record,"¹⁵ discharge monitoring reports in the record reveal discharges of chlorine residual into Woods Creek from 2004 through 2007. In January 2004, for example, there were sixteen consecutive days during which chlorine residual was discharged at concentrations ranging from 0.010 mg/L to 0.030 mg/L. For the

⁷ See <http://www.epa.gov/waterscience/criteria/wqctable> (last visited June 29, 2009).

⁸ A maximum daily effluent limitation is the highest allowable daily discharge of a pollutant, over a calendar day (or 24-hour period). An average monthly effluent limitation is the highest allowable average of daily discharges over a calendar month.

⁹ Order No. R5-2008-0162, pp. F37-38.

¹⁰ Petition, p. 24.

¹¹ Central Valley Water Board Response to Petition, Feb. 9, 2009, p.14.

¹² *Ibid.* With respect to sampling frequency, both the current and previous permits require (d) the discharger to conduct daily grab samples.

¹³ *Ibid.*

¹⁴ *Ibid.* (emphasis added). The Permit's Fact Sheet also notes that chlorine has never been detected in the effluent. (See Order No. R5-2008-0162, pp. F21-22.)

¹⁵ *Ibid.*

entire month of March 2004, there were discharges of chlorine residual ranging from 0.010 mg/L, to as high as 0.05 mg/L.¹⁶ From 2005 through 2007, the monitoring results reported consistent detections of chlorine residual at concentrations greater than zero mg/L. Therefore, the Central Valley Water Board's claim that "chlorine has never been detected in the effluent"¹⁷ is incorrect. It is clear that chlorine does not completely dissipate or oxidize from the effluent being stored in the Quartz Reservoir.

The 2008 Permit's effluent limitations for chlorine residual are less stringent than those in the 2001 Permit. The Central Valley Water Board states that it followed TSD procedures to convert the U.S. EPA's National Recommended Ambient Water Quality Criteria for chlorine of 0.019 mg/L and 0.011 mg/L (the 2001 Permit limitations) into 0.02 mg/L as an MDEL and 0.01 mg/L as an AMEL.¹⁸ However, State Water Board staff employed the same TSD procedures, using daily monitoring results from April 2003 through March 2007, and calculated more stringent limitations. State Water Board staff determined that the correct conversion of the U.S. EPA's recommended criteria is 0.019 mg/L MDEL and 0.0057 mg/L AMEL, which is indeed more stringent than 0.02 mg/L MDEL and 0.01 mg/L AMEL.¹⁹

The Central Valley Water Board does not contend that an exception to the anti-backsliding rule applies, nor does there appear to be an applicable exception. In adopting these less stringent effluent limitations for chlorine residual, the Central Valley Water Board not only disregarded monitoring data showing actual discharges of chlorine into Woods Creek, but also developed less stringent limitations based on calculations that cannot be validated by the State Water Board. These actions are contrary to the purpose of the Clean Water Act's anti-backsliding provision that "[a] permit may not be renewed, reissued, or modified to contain effluent limits which are less stringent than comparable effluent limits in the previous permit."²⁰

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¹⁶ In light of the dischargers' documented exceedances of the effluent limitations for chlorine residual in 2004, it appears that some enforcement is required. Exceedance of a chlorine residual limitation is a serious violation. (Wat. Code, § 13385 subd. (h)(2)(A).) Regional water boards must impose a mandatory minimum penalty under the Porter-Cologne Water Quality Control Act of \$3,000 for each serious violation. (*Id.*, § 13384(h)(1).)

¹⁷ See Order No. R5-2008-0162, pp. F21-22.

¹⁸ *Ibid.* at F37-38.

¹⁹ Unfortunately, the Central Valley Water Board does not explain how it arrived at its calculations, in either the fact sheet or elsewhere in the record.

²⁰ 33 U.S.C. § 1342(o)(2).

B. Chlorine toxicity

It is well documented that chlorine is toxic to aquatic life, even at low concentrations. For example, fish can be killed if exposed (for one hour) to as little as 0.019 mg/L of chlorine;²¹ brown trout experience total mortality if exposed to 0.04 mg/L of chlorine residual for two minutes;²² and fifty percent of rainbow trout will die within ninety-six hours at residual chlorine concentrations of 0.014 to 0.029 mg/L.²³

Chlorine toxicity depends on a variety of factors, most critically concentration and exposure time, but also temperature, existing water quality and chemistry, and the species' life stage and size.²⁴ Besides death, other toxic effects include liver and kidney damage, the disruption of reproductive function, and reduced species diversity.²⁵ Freshwater fish such as cold-water salmonids and several species of minnows are extremely sensitive to the toxic effects of chlorine.²⁶ Spawning in fathead minnows is practically eliminated at 0.085 mg/L of chlorine residual, and the number of spawnings per female is significantly reduced at 0.043 mg/L.²⁷ Studies have also observed that after exposure to 0.01 mg/L over a seven-day period, fish species diversity can be reduced by fifty percent.²⁸ Rainbow trout will even avoid concentrations as low as 0.001 mg/L.²⁹

The 2008 Permit's chlorine residual effluent limitations are not protective of aquatic life. Most wastewater treatment plants dechlorinate the chlorinated wastewater, a process which removes any remaining free or total combined chlorine residual. As noted above, however, TUD and JSD do not dechlorinate and expect the chlorine to naturally dissipate through oxidation in the Quartz Reservoir. This does not occur, however, as demonstrated by monitoring data showing concentrations of chlorine residual as high as 0.05 mg/L in 2004, and daily detections of 0.01 mg/L as recently as 2007. Because there is no evidence that TUD and

²¹ See U.S. EPA, Ambient Water Quality Criteria for Chlorine, 1984, pp. 17-18, available at <http://www.epa.gov/waterscience/criteria/library/ambientwqc/chlorine1984.pdf>; see also State Water Board Order WQ 75-6 (*Department of Fish and Game*), p. 3 (finding that chlorine residual of 0.5 mg/L is harmful to aquatic life).

²² William A. Brungs, *Effects of Residual Chlorine on Aquatic Life* (1973) 45 J. Wat. Pollution Control Federation 2180, 2183 Table II.

²³ *Ibid.* at 2184.

²⁴ Brooks and Seegert, *The Toxicity of Chlorine to Freshwater Organisms Under Varying Environmental Conditions*, in *Water Chlorination: Environmental Impact and Health Effects* (Robert L. Jolley ed., 1978) pages 262-275.

²⁵ *Ibid.*

²⁶ *Ibid.*

²⁷ *Ibid.*

²⁸ Brungs, *supra* note 22, at 2183 Table I.

²⁹ *Ibid.* Table II.

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JSD have begun dechlorinating the effluent, and because the chlorine effluent limitations are less stringent than what U.S. EPA recommends, there is a strong likelihood that chlorine residual will be detected in future discharges in Woods Creek, with possible acute or chronic toxic effects to fish.

The Central Valley Water Board's assertion that there is no threat of a chlorine release is unfounded, and its attendant decision to relax the effluent limitations notwithstanding knowledge of chlorine's toxic effects and evidence of actual chlorine discharges is unjustified.

Consequently, the 2008 Permit must be revised to include more stringent effluent limitations that comply with the Basin Plan and the Clean Water Act.

III. ORDER

IT IS HEREBY ORDERED THAT Order No. R5-2008-0162 is remanded to the Central Valley Water Board for reconsideration and revisions consistent with the findings and conclusions discussed in this Order. Specifically, the Central Valley Water Board must do either of the following:

1. Amend the 2008 Permit to retain the chlorine residual effluent limitations of the 2001 permit; or
2. Amend the 2008 Permit to convert the chlorine residual effluent limitations to an AMEL and MDEL by using TSD procedures, current effluent data, and by including the frequency of daily monitoring into the equation.

CERTIFICATION

The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on September 15, 2009.

AYE:

NO:

ABSENT:

ABSTAIN:

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Jeanine Townsend
Clerk to the Board