CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2014-0054

AMENDING WASTE DISCHARGE REQUIREMENTS
ORDER R5-2008-0154 (NPDES PERMIT NO. CA0079138)

CITY OF STOCKTON
REGIONAL WASTEWATER CONTROL FACILITY
SAN JOAQUIN COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter "Central Valley Water Board") finds that:

1. On 23 October 2008, the Central Valley Water Board adopted Waste Discharge Requirements Order R5-2008-0154, prescribing waste discharge requirements for the Regional Wastewater Control Facility, San Joaquin County. For purposes of this Order, the City of Stockton is hereafter referred to as "Discharger" and the Regional Wastewater Control Facility is hereafter referred to as "Facility."

2. The Discharger owns and operates a municipal wastewater treatment facility. The Facility consists of tertiary level wastewater treatment. After primary and secondary treatment, the wastewater undergoes tertiary treatment in facultative lagoons, constructed wetlands, two nitrifying biotowers, dissolved air floatation, mixed-media filters, and is disinfected using chlorination/dechlorination facilities.

3. Waste Discharge Requirements Order R5-2008-0154 (NPDES Permit No. CA0079138) authorizes the discharge of up to 55 million gallons per day of tertiary treated wastewater to the San Joaquin River, within the Sacramento-San Joaquin Delta.

4. Order R5-2008-0154 established salinity requirements and electrical conductivity effluent limitations based on the *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (Bay-Delta Plan) seasonal salinity water quality objectives for the San Joaquin River at Brandt Bridge of 700 µmhos/cm (April through August) and 1,000 µmhos/cm (September through March), as the 14-day running average electrical conductivity.

5. On 1 June 2011, the Superior Court for Sacramento County entered a judgment and peremptory writ of mandate in the matter of *City of Tracy v. State Water Resources Control Board* (Case No. 34-2009-8000-392-CU-WM-GDS) (Tracy Decision), ruling that the South Delta salinity objectives shall not apply to the City of Tracy and other municipal dischargers in the South Delta area pending reconsideration of the South Delta salinity objectives under California Water Code §13241 and adoption of a proper program of implementation under California Water Code §13242 that includes municipal dischargers.

6. On 5 November 2013, the Superior Court for Sacramento County entered a judgment and peremptory writ of mandate in the matter of *City of Stockton v. State Water Resources Control Board and California Regional Water Quality Control Board for the Central Valley* Region (Case No. 34-2010-80000488-CU-WM-GDS) (Stockton Decision), ruling that the City of Stockton is a municipal discharger within the meaning of the Tracy Decision (discussed above), and the Central Valley Water Board is ordered to modify section IV.A.1 and Attachment F (Fact Sheet) of Central Valley Water Board Order R5-2008-0154 (NPDES No. CA0079138).

7. Order R5-2008-0154 contains effluent limitations for electrical conductivity (Limitations and Discharge Requirements, section IV.A.1.j). In accordance with the Superior Court for Sacramento County Orders discussed above, Order R5-2008-0154 is amended to remove the electrical conductivity effluent limitations and rationale (Fact Sheet, section IV.3.bb) based on the South Delta salinity objectives.

8. Issuance of this Order is exempt from the provisions of the California Environmental Quality Act (Pub. Resources Code, § 21000 et seq.) ("CEQA") pursuant to Water Code section 13389, since the adoption or modification of a NPDES permit for an existing source is statutorily exempt and this Order only serves to modify a NPDES permit (*Pacific Water Conditioning Ass'n, Inc. v. City Council of City of Riverside* (1977) 73 Cal.App.3d 546, 555-556.).

9. The Central Valley Water Board has notified the Discharger and interested agencies and persons of its intent to amend Waste Discharge Requirements for this discharge and has provided them with an opportunity to submit their written views and recommendations.

IT IS HEREBY ORDERED THAT:

Waste Discharge Requirements Order R5-2008-0154 (NPDES No. CA0079138) is amended solely to address the electrical conductivity requirements in accordance with the Stockton Decision, described in Finding 6. **Effective immediately upon adoption**, Order R5-2008-0154 is amended as shown in Items 1-3 below.

1. **Limitations and Discharge Specifications**. Remove the text in section IV.A.1.j as follows in strikeout format below:

    j. **Electrical Conductivity.**

        i. The electrical conductivity in the discharge shall not exceed an annual average of 1,300 µmhos/cm;

        ~~ii. If the Discharger fails to comply with the requirements in 1) or 2), below, the electrical conductivity in the discharge shall not exceed a monthly average of 700 µmhos/cm (1 April to 31 August), and 1000 µmhos/cm (1 September to 31 March):~~

            1) The Discharger shall develop and submit a Salinity Plan as specified in Provision VI.C.3.c; and

            2) The Discharger shall timely implement the Salinity Plan upon the Regional Water Board's approval. The proposed Salinity Plan will be circulated for no less than 30 days of public comment prior to the Regional Water Board's consideration of the Salinity Plan. The Regional Water Board may revise the Salinity Plan prior to final approval.

~~Upon determination by the Regional Water Board that the Discharger has materially failed to comply with the approved Salinity Plan due to circumstances within its control, the monthly average effluent limitations for electrical conductivity specified in j.ii., above, shall become effective immediately.~~

2. **Attachment F, Fact Sheet –** Remove the text in section IV.C.3.b as shown in strikeout format below:

   b. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard. Based on information submitted as part of the application, in studies, and as directed by monitoring and reporting programs, the Regional Water Board finds that the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a water quality standard for aluminum, ammonia, bis (2-ethylhexyl) phthalate, chlorine (total residual), chlorodibromomethane, cyanide, dichlorobromomethane, ~~electrical conductivity,~~ manganese, molybdenum, and nitrate plus nitrite. Water quality-based effluent limitations (WQBELs) for these constituents are included in this Order. A summary of the reasonable potential analysis (RPA) is provided in Attachment G, and a detailed discussion of the RPA for each constituent is provided below.

3. **Attachment F, Fact Sheet –** Remove the text in section IV.C.3.bb, Salinity, as shown in strikeout format below:

   bb. **Salinity.** The discharge contains total dissolved solids (TDS), chloride, sulfate, and electrical conductivity (EC). These are water quality parameters that are indicative of the salinity of the water. Their presence in water can be growth limiting to certain agricultural crops and can affect the taste of water for human consumption. There are no USEPA water quality criteria for the protection of aquatic organisms for these constituents. The Basin Plan contains a chemical constituent objective that incorporates State MCLs, contains a narrative objective, and contains numeric water quality objectives for EC, TDS, sulfate, and chloride. Table F-5 below summarizes salinity water quality objectives/criteria and effluent concentration values.

Table F-5. Salinity Water Quality Criteria/Objectives

Parameter	Agricultural WQ Goal[1]	Bay-Delta Plan	Secondary MCL[2]	Effluent	
				Avg	Max
EC (µmhos/cm)	Varies[3]	~~700 (1 Apr-31 Jul) 1000 (1 Aug – 31 Mar)~~	900, 1600, 2200	1205	1518
TDS (mg/L)	Varies	N/A	500, 1000, 1500	668	730
Sulfate (mg/L)	Varies	N/A	250, 500, 600	120	180
Chloride (mg/L)	Varies	N/A	250, 500, 600	178	210

[1] Agricultural water quality goals based on *Water Quality for Agriculture*, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985)

[2] The secondary MCLs are stated as a recommended level, upper level, and a short-term maximum level.

[3] The EC level in irrigation water that harms crop production depends on the crop type, soil type, irrigation methods, rainfall, and other factors. An EC level of 700 umhos/cm is generally considered to present no risk of salinity impacts to crops. However, many crops are grown successfully with higher salinities.

The State Water Board's Bay-Delta Plan establishes water quality objectives at various "compliance points" in the estuary to protect beneficial uses. The Bay-Delta Plan at page 10 states: "The water quality objectives in this plan apply to waters of the San Francisco Bay system and the legal Sacramento-San Joaquin Delta, as specified in the objectives. Unless otherwise indicated, water quality objectives cited for a general area, such as for the southern Delta, are applicable for all locations in that general area and compliance locations will be used to determine compliance with the cited objectives." What constitutes "in that general area" is not defined in the Plan.

The two nearest Bay Delta Plan compliance points are the San Joaquin River at Brandt Road Bridge, south of the discharge point along the San Joaquin River, and the San Joaquin River at Prisoner's Point, toward San Francisco Bay from the discharge point. Stockton's discharge is located between these two compliance points. The San Joaquin River at Brandt Bridge and at the discharge point is largely unchanged. The River flows in a relatively shallow, winding channel, and there are not major diversions or tributaries to the River between Brandt Bridge and Stockton. ~~The Brandt Bridge compliance point is established to protect agricultural irrigation uses, and seasonally varies from 700 to 1000 µmhos/cm.~~ The primary use of River Water at both locations is agricultural irrigation. In contrast, the Prisoner's Point compliance point is located along the Stockton Deep Water Ship Channel where the San Joaquin River has been deepened and straightened. At Prisoner's Point there is seasonally a significant flow of Sacramento River water moving cross-Delta to the pumps near Tracy. The Prisoner's Point compliance point requires the April – May salinity to be maintained at 440 µmhos/cm or less, and is set to protect fish and wildlife beneficial uses. ~~The water quality objectives prescribed for Brandt Road Bridge are judged to be applicable at the site of the Stockton discharge, as being in the "general area" of the compliance point and as having similar River and beneficial use conditions that would make the Brandt Road objective appropriate for beneficial use protection at the discharge point.~~

i. **Chloride**. The secondary MCL for chloride is 250 mg/L, as a recommended level, 500 mg/L as an upper level, and 600 mg/L as a short-term maximum. The recommended agricultural water quality goal for chloride, that would apply the narrative chemical constituent objective, is 106 mg/L as a long-term average based on Water Quality for Agriculture, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D. W. Westcot, Rome, 1985). The 106 mg/L water quality goal is intended to protect against adverse effects on sensitive crops when irrigated via sprinklers.

Chloride concentrations in the effluent ranged from 130 mg/L to 210 mg/L, with an average of 177.5 mg/L, for 12 samples collected by the Discharger from 29 January 2002 through 4 December 2002. Background concentrations in the San Joaquin River ranged from 38 mg/L to 140 mg/L, with an average of 108 mg/L, for 11 samples collected by the Discharger from 20 March 2002 through 4 December 2002. Both the receiving water and the effluent concentrations exceed the agricultural water quality goal of 106 mg/L.

ii. **Electrical Conductivity (EC)**. The secondary MCL for EC is 900 µmhos/cm as a recommended level, 1600 µmhos/cm as an upper level, and 2200 µmhos/cm as a short-term maximum. The agricultural water quality goal, that would apply the narrative chemical constituents objective, is 700 µmhos/cm as a long-term average based on Water Quality for Agriculture, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985). ~~The Bay-Delta Plan's seasonal salinity objectives for the San Joaquin River at Brandt Bridge are 700 µmhos/cm from April through August, and 1000 µmhos/cm from September through March. These objectives are applicable throughout the general geographic area, and, therefore, apply to the Facility's discharge.~~

A review of the Discharger's monitoring reports for the last six years (2002 through 2007) shows an average effluent EC of 1205 µmhos/cm, with a range from 946 µmhos/cm to 1518 µmhos/cm for 290 samples. ~~These levels exceed the applicable objectives.~~ The background receiving water EC averaged 602.8 µmhos/cm in 192 sampling events collected by the Discharger from 20 March 2002 through 9 January 2007, with a maximum high of 1169 µmhos/cm. ~~These data show that the receiving water frequently has no assimilative capacity for EC.~~

iii. **Sulfate**. The secondary MCL for sulfate is 250 mg/L as a recommended level, 500 mg/L as an upper level, and 600 mg/L as a short-term maximum. Sulfate concentrations in the effluent ranged from 10 mg/L to 180 mg/L, with an average of 119.8 mg/L, for 12 samples collected by the Discharger from 29 January 2002 through 4 December 2002. Background concentrations in the San Joaquin River ranged from 37 mg/L to 130 mg/L, with an average of 86.7 mg/L, for 10 samples collected by the Discharger from 20 March 2002 through 4 December 2002. These concentrations do not exceed the secondary MCL recommended level of 250 mg/L.

iv. **Total Dissolved Solids (TDS)**. The secondary MCL for TDS is 500 mg/L as a recommended level, 1000 mg/L as an upper level, and 1500 mg/L as a short-term maximum. The recommended agricultural water quality goal for TDS, that would apply the narrative chemical constituent objective, is 450 mg/L as a long-term average based on Water Quality for Agriculture, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985). Water Quality for Agriculture evaluates the impacts of salinity levels on crop tolerance and yield reduction, and establishes water quality goals that are protective of the agricultural uses.

The 450 mg/L water quality goal is intended to prevent reduction in crop yield, i.e., a restriction on use of water, for salt-sensitive crops. Only the most salt sensitive crops require irrigation water of 450 mg/L or less to prevent loss of yield. Most other crops can tolerate higher TDS concentrations without harm; however, as the salinity of the irrigation water increases, more crops are potentially harmed by the TDS, or extra measures must be taken by the farmer to minimize or eliminate any harmful impacts.

The average TDS effluent concentration was 668 mg/L; concentrations ranged from 550 mg/L to 730 mg/L for 12 samples collected by the Discharger from 29 January 2002 through 4 December 2002. These concentrations exceed the applicable water quality objectives. The background receiving water TDS ranged from 260 mg/L to 590 mg/L, with an average of 434 mg/L in 10 sampling events performed by the Discharger from 20 March 2002 through 4 December 2002. These data indicate the receiving water frequently exceeds water quality objectives and lacks assimilative capacity for TDS.

As required by previous Order No. R2-2002-0083, the Discharger completed a Wastewater Treatment Feasibility Study (June 2004) and pollution prevention plan (February 2005) for TDS. In the June 2004 report, the Discharger states "it could be argued that the effluent discharge for Stockton's RWCF helps maintain water quality objectives of the Delta.", that "the Discharge will not impact this [Southern one-third of the Delta that is 303(d) listed] impaired area", and that "further treatment for TDS is unnecessary." However, in both reports, the Discharger provided the following alternatives that could further reduce salinity in the discharge if required:

- Source control:
  1) Actively monitor TDS levels in its drinking water supply wells and reduce the groundwater supply and supplement with surface water if groundwater TDS levels exceed the secondary MCL water quality objective; and
  2) Develop an industrial outreach program to encourage industrial users to reduce TDS levels in the influent.
- Salinity removal processes: Add a pressure driven membrane system to the current treatment process train; however this alternative may pose additional issues with the disposal of the reject brine. Additionally, an estimated $295 million would be required to add these advanced treatment facilities, and annual operation and maintenance costs are estimated at an additional $21.6 million per year. (see section v. Salinity Effluent Limitations below for further discussion)
- Local ordinances: Develop local regulations to ban installation and use of new and existing water softeners and local industrial TDS limits to reduce concentrations in the influent.

v. **Salinity Effluent Limitations.** Effluent limitations based on the MCL, the agricultural water quality goal, or the Basin Plan would likely require construction and operation of a reverse osmosis treatment plant. The State Water Board, in

Water Quality Order 2005-005 (for the City of Manteca), states, "…*the State Board takes official notice [pursuant to Title 23 of California Code of Regulations, Section 648.2] of the fact that operation of a large-scale reverse osmosis treatment plant would result in production of highly saline brine for which an acceptable method of disposal would have to be developed. Consequently, any decision that would require use of reverse osmosis to treat the City's municipal wastewater effluent on a large scale should involve thorough consideration of the expected environmental effects."* The State Water Board states in that Order, "*Although the ultimate solution to southern Delta salinity problems have not yet been determined, previous actions establish that the State Board intended for permit limitations to play a limited role with respect to achieving compliance with the EC water quality objectives in the southern Delta*." The State Water Board goes on to say, "*Construction and operation of reverse osmosis facilities to treat discharges…prior to implementation of other measures to reduce the salt load in the southern Delta, would not be a reasonable approach."* In addition, the State Board expressed concerns about costs of reverse osmosis; the same considerations apply to this Facility.

The Regional Water Board, with cooperation of the State Water Board, has begun the process to develop a new policy for the regulation of salinity in the Central Valley. In a statement issued at the 16 March 2006, Regional Water Board meeting, Board Member Dr. Karl Longley recommended that the Regional Water Board continue to exercise its authority to regulate discharges of salt to minimize salinity increases within the Central Valley. Dr. Longley stated, "*The process of developing new salinity control policies does not, therefore, mean that we should stop regulation salt discharges until a possible interim approaches to continue controlling and regulating salts in a reasonable manner, and encourage all stakeholder groups that may be affected by the Regional Board's policy to actively participate in policy development*."

As previously described, effluent data for EC and TDS indicate that effluent concentrations continue to be at levels of concern that may affect beneficial uses of the San Joaquin River. Therefore, this Order includes an annual average performance-based effluent limitation of 1300 µmhos/cm for EC to protect the receiving water from further salinity degradation, based on the highest annual average effluent concentration (see Table F-6 below). ~~However, should the Discharger fail to implement the provisional requirements specified in Provision VI.C.3.c of this Order, then this Order requires the Discharger to comply with the seasonal monthly average EC effluent limits of 700 µmhos/cm from April through August and 1000 µmhos/cm from September through March instead, which are based on the Bay-Delta Plan water quality objectives for this geographical location. The Bay-Delta objectives are under review, but when or if the salinity objectives will be changed is unknown. The Regional Water Board must implement water quality objectives as they exist at this time.~~

Compliance with these effluent limitations and the requirements of Provision VI.C.3.c will result in a salinity reduction in the effluent discharged to the receiving water.~~; however, the discharge may cause or contribute to an~~

~~exceedance of a water quality objective for salinity until adequate measures are implemented to meet those objectives.~~

Table F-6. Summary of Annual Electrical Conductivity Effluent Concentrations

Electrical Conductivity (µmhos/cm)				
Year	**Count**	**Min**	**Avg**	**Max**
2002	40	1144	1264	1420
2003	50	1072	1195	1370
2004	50	1073	1209	1455
2005	48	1004	1229	1355
2006	50	968	1180	1518
2007	52	909	1089	1254

Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:
http://www.waterboards.ca.gov/public_notices/petitions/water_quality
or will be provided upon request.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on **28 March 2014**.

ORIGINAL SIGNED BY

PAMELA C. CREEDON, Executive Officer