Central Valley Regional Water Quality Control Board
3/4 October 2013 Board Meeting

Response to Comments
for the
City of Davis
City of Davis Wastewater Treatment Plant
Tentative NPDES Permit Renewal
and Tentative Time Schedule Order

The following are Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board) staff responses to comments submitted by interested parties regarding the tentative Waste Discharge Requirements for NPDES Permit No. CA0079049 (NPDES Permit) renewal and tentative Time Schedule Order (TSO) for the City of Davis (hereinafter Discharger), City of Davis Wastewater Treatment Plant (Facility).

The tentative NPDES Permit was issued for a 30-day public comment period on 21 May 2013 and comments were due 20 June 2013. The Central Valley Water Board received public comments regarding the tentative documents by the due date from the following interested parties:

- City of Davis (Discharger)
- United States Environmental Protection Agency (USEPA)

Changes were made to the tentative NPDES Permit and the tentative TSO based on public comments received. The submitted comments were accepted into the record, and are summarized below, followed by Central Valley Water Board staff responses.

DISCHARGER COMMENTS

Discharger Comment No. 1. Compliance Schedule

The Discharger comments that the proposed NPDES Permit includes time schedules that would be difficult to meet if circumstances beyond their control should cause delays in the progress. The Discharger would like to include a footnote expressing these potential issues. If the footnote is not included the Discharger requests that a reopener be added to the proposed NPDES Permit.

RESPONSE: Central Valley Water Board staff concurs with the Discharger's concern. However, in the event that circumstances outside the Discharger's control causes the Discharger to not be able to comply with the compliance schedules, the proposed NPDES Permit already includes a reopener that allows the permit to be reopened to address the issue. Likewise, if the Discharger shows due diligence and progress towards achieving compliance with the schedules in the proposed NPDES Permit and proposed TSO, the Discharger may submit an infeasibility study and request that the compliance schedules be amended. No changes were made to the proposed NPDES Permit or proposed TSO.

Discharger Comment No. 2. Clarification and Corrections. Tentative Order, Section IV.A.2.i (p.15).

The Discharger comments that the methylmercury waste load allocation (WLA) in the Delta Mercury TMDL was calculated incorrectly and requested that a footnote be added to the proposed NPDES Permit to clarify this issue.

RESPONSE: Central Valley Water Board staff concurs in part. While the WLA may have been erroneously calculated, in accordance with 40 CFR 122.44(d)(1)(vii)(B) and the *Implementation of Toxic Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP)*, the proposed NPDES Permit contains a final effluent limitation for methylmercury based on the WLA. A footnote is not appropriate for the final effluent limitation, however, changes were made, in part, to section IV.C.3.c.viii.(c).(2) of the Fact Sheet in the proposed NPDES Permit to document the Discharger's concerns, as shown below in underline format:

> The Basin Plan's Delta Mercury Control Program includes wasteload allocations for POTWs in the Delta, including discharges to the Conaway Ranch Toe Drain via Discharge Point No. 002. The Discharger states that the wasteload allocation of 0.17 g/yr presented in the Basin Plan for the City of Davis was erroneously calculated using a number of discharge days per year of 149, and instead, should have been calculated using 365 days. The Basin Plan states "*By 20 October 2020, at a public hearing, and after scientific peer review and public review process, the Regional Water Board shall review the Delta Mercury Control Program and **may*** [emphasis added] *consider modification of objectives, allocations, implementation provisions and schedules, and the Final Compliance Date.*" (Phase 1 Delta Mercury Control Program Review, p. IV-33.17) Therefore, the calculation of the wasteload allocation may be reviewed during the Phase 1 Delta Mercury Control Program Review, prior to final adoption of the Delta Mercury Control Program waste load allocations. However, in accordance with 40 CFR 122.44(d)(1)(vii)(B) and the SIP, this Order contains final WQBELs for methylmercury based on the wasteload allocation in the Basin Plan. The total calendar annual methylmercury load shall not exceed 0.17 grams at Discharge Point No. 002.

Discharger Comment No. 3. Clarifications and Corrections. Attachment E.

The Discharger comments there are several clarifications and corrections that are necessary in Attachment E of the tentative NPDES Permit.

RESPONSE: Central Valley Water Board staff concurs and changes were made to the proposed NPDES Permit, in part, as shown in underline/strikeout format below:

Section IV.A, Table E-3 (p. E-5)

Table E-3. Effluent Monitoring – Monitoring Location EFF-A

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Conventional Pollutants				
Total Coliform Organisms	MPN/100 mL	Grab	3/Week[45]	[3]
Turbidity[1, 6]	NTU	Meter	Continuous	[3]

[1] Prior to completion of the upgraded tertiary facility, BOD_5, TSS, ~~turbidity,~~ and electrical conductivity may be monitored at EFF-001 and EFF-002 in lieu of EFF-A.

[5] Samples shall be collected downstream of the last chlorine addition, prior to dechlorination.

[6] Turbidity not required to be monitored until 25 October 2017. Turbidity shall be measured after tertiary filtration and prior to disinfection.

Section X.D. Table E-13 (p. E-20)

Table E-13. Reporting Requirements for Special Provisions Reports

Special Provision	Reporting Requirements
~~CVCWA Coordinated Methylmercury Control Study Progress Report for Mercury (Section VI.C.2.c)~~	~~**20 October 2015**~~
Central Valley Clean Water Association Coordinated Methylmercury Control Study, Progress Report (Section VI.C.7.~~e~~d of this Order)	**20 October 2015**

Discharger Comment No. 4. Clarifications and Corrections. Attachment F.

The Discharger requests the following clarifications in the Fact Sheet of the tentative NPDES Permit.

RESPONSE: Central Valley Water Board staff concurs and changes were made to the proposed NPDES Permit, in part, as shown in strikeout format below:

Section II.A.

Operation of the treatment system varies depending on season. During the summer, wastewater from the primary sedimentation tanks is discharged to the facultative oxidation ponds, which are operated in parallel~~, and then to the polishing pond. Effluent from the polishing pond is then pumped to the overland flow system~~.
…

Discharger Comment No. 5. Corrections and Clarifications. Time Schedule Order

The Discharger comments there are some minor corrections that are necessary in the tentative TSO.

RESPONSE: Central Valley Water Board staff concurs and changes were made to Table 7 of Finding 4 and the Table in Provision 3 of the proposed TSO, in part, as shown in underline/strikeout format below:

Finding 4 (p.2)

Table 7. Effluent Limitations – Discharge Point No. 002

Parameter	*Units*	*Effluent Limitations*			
		Average Monthly	*Maximum Daily*	*Instantaneous Minimum*	*Instantaneous Maximum*

Provision 3 (p.9-10)

Parameter	Units	Average Monthly~~Maximum Daily~~	Maximum Daily~~Average Monthly~~

USEPA COMMENTS

USEPA Comment No. 1. A. Iron

USEPA comments that "there appears to be an error in the rationale for determining whether there is reasonable potential for the discharge to exceed the water quality objective for iron." USEPA further contends that the data used in the reasonable potential analysis (RPA) to determine the maximum effluent concentration (MEC) was from September 2011 through December 2012, but there is no justification why this period was used instead of using the data from the entire permit term. USEPA also contends that reasonable potential for the effluent discharges exists and that the effluent limits in the existing permit based on the same water quality objective must be retained.

RESPONSE: Central Valley Water Board staff concurs, in part. The rationale in the Fact Sheet of the tentative NPDES Permit used for the RPA for iron was not adequately characterized.

Central Valley Water Board staff does not concur that the effluent limits in the current permit must be retained. The current permit determined that the discharges "has reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan's narrative toxicity objective" based on USEPA's recommended National Ambient Water Quality Criteria (NAWQC) for iron for the protection of freshwater aquatic life, which is contained in the *Quality Criteria for Water* of 1976 (commonly known as the "Red Book"). A subsequent version of the Red Book, *Quality Criteria for Water 1986*, updated many of the NAWQC based on newer studies but did not

update the information for iron. However, USEPA in this document clarifies the intent and usage of the recommended NAWQC as, "*These criteria are not rules and they do not have regulatory impact. Rather, these criteria present scientific data and guidance of the environmental effects of pollutants which can be useful to derive regulatory requirements based on considerations of water quality impacts."* The 1976 recommended NAWQC for iron was not promulgated in the National Toxics Rule (December 22, 1992 and amended May 4, 1995), and thus, the California Toxic Rule does not include criteria for iron. Still, staff reviewed the 1976 Red Book scientific data for iron to determine if the 1976 recommended NAWQC is applicable and appropriate to derive requirements for the protection of aquatic life in the receiving waters for compliance with the Basin Plan's narrative toxicity objective.

The 1976 recommended NAWQC contains scientific information gathered between 1937 and 1974 and the recommended criterion for iron of 1.0 mg/L for the protection of freshwater aquatic life was based on a 1964 European Inland Fisheries Advisory Commission recommendation for waters managed for aquatic life. Another study conducted on the toxicity of Industrial wastes stated that *"trout (species not known) died at iron concentrations of 1 – 2 mg/L*. In another study conducted in iron polluted waters in Colorado (1967) indicated that *"trout was not observable until the waters were diluted or the iron had precipitated to effect a concentration of less than 1.0 mg/L."* Also field studies regarding stream pollution in a report from 1937 showed "*that in 69 of 75 study sites with good fish fauna, the iron concentration was less than 10 mg/L.*" These studies did not state whether iron concentrations were in the form of dissolved or total. Based on these findings, the variable scientific data from these studies is not useful to determine water quality impacts on aquatic life in the receiving waters. Moreover, other NPDES permits adopted by the Central Valley Water Board do not determine compliance with the Basin Plan's narrative toxicity objective based on the 1976 recommended NAWQC for iron.

The Discharger conducted two studies from September 2011 through December 2012 to evaluate the dissolved iron concentrations in the effluent discharges. Water quality standards for CTR metals are in the dissolved form. Because of this, staff also found it appropriate to use the dissolved concentration analytical results from the Discharger's studies in the reasonable potential analysis. The MEC of dissolved iron at Discharge Point 001 is 0.2 mg/L and the MEC of dissolved iron at Discharge Point 002 is 0.16 mg/L, and therefore, the discharges do not demonstrate reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan's narrative toxicity objective.

Changes were made to the Fact Sheet of the proposed NPDES Permit to adequately characterize the RPA for iron and support the conclusion that iron concentrations in the discharge does not exhibit reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan's narrative toxicity objective or adversely affect aquatic life, as shown in underline/strikeout format below:

i. Iron~~, Dissolved~~ – Discharge Point Nos. 001 and 002

(a) WQO. ~~The~~ USEPA recommend~~ed chronic criterion of 1,000 µg/L~~ National Ambient Water Quality Criteria (NAWQC) for ~~dissolved~~ iron for the protection of freshwater aquatic life in the *Quality Criteria for Water* of 1976 (commonly known as the "Red Book") at 1 mg/L, based on information gathered between 1937 and 1974. The 1976 Red Book does not clearly state whether the criteria concentration is as dissolved iron or total iron. USEPA updated the 1976 Red Book for certain constituents in the document titled, *Quality Criteria for Water 1986*, commonly known as the "Gold Book", however, iron was not updated. Nevertheless, USEPA clarifies the intent and usage of the recommended NAWQC in the Gold Book, *"These criteria are not rules and they do not have regulatory impact. Rather, these criteria present scientific data and guidance of the environmental effects of pollutants which can be useful to derive regulatory requirements based on considerations of water quality impacts."* The 1976 recommended NAWQC for iron was not promulgated in the National Toxics Rule (December 22, 1992 and amended May 4, 1995), and thus, the California Toxic Rule does not include iron criteria for the protection of aquatic life or human health. ~~and may be used to implement the Basin Plan's narrative toxicity objective. The NAWQC chronic criterion is applicable to Discharge Point Nos. 001 and 002. Order R5-2010-0132-02 included effluent limits for iron at both discharge points.~~

The recommended NAWQC for iron of 1.0 mg/L applicable to freshwater aquatic life was based on a 1964 European Inland Fisheries Advisory Commission recommendation for waters managed for aquatic life, but the 1976 Red Book also cited scientific data for iron from other studies. One study conducted on the toxicity of Industrial wastes stated that *"trout (species not known) died at iron concentrations of 1 – 2 mg/L* [unknown whether in the form of dissolved or total iron]. In another study conducted in iron polluted waters in Colorado (1967) indicated that *"trout was not observable until the waters were diluted or the iron had precipitated to effect a concentration of less than 1.0 mg/L."* Also field studies regarding stream pollution in a report from 1937 showed "*that in 69 of 75 study sites with good fish fauna, the iron concentration was less than 10 mg/L.*" The 1976 Red Book also suggests the water quality characteristics of the receiving water effect the toxicity of iron, *"Ambient natural waters will vary with respect to alkalinity, pH, hardness, temperature and the presence of ligands which change the valence state and solubility, and therefore the toxicity of the metal."*

Based on the scientific data and information presented in the 1976 Red Book, Central Valley Water Board determined that the recommended NAWQC for iron is not applicable to the receiving waters, and thus, is not appropriate to determine compliance with the Basin Plan's narrative toxicity objective.

The California Department of Public Health (DPH) has established Secondary MCLs to assist public drinking water systems in managing their drinking water for aesthetic conditions such as taste, color, and odor. However, Municipal and Domestic Supply beneficial use does not apply to the Willow Slough Bypass or Conaway Ranch Toe Drain, and therefore, the DPH Secondary MCL does not apply at the discharge.

(b) RPA Results

To determine compliance with federal anti-backsliding regulations this reasonable potential analysis was conducted with the 1976 NAWQC recommended criterion that was used in Order R5-2007-0132-02 to determine compliance with the Basin Plan's narrative toxicity objective.

~~**(1) Discharge Point No. 001.** The maximum observed effluent concentration for dissolved iron at Discharge Point No. 001 was 100 µg/L based on 3 samples collected between September 2011 and December 2012. Dissolved iron concentrations in the receiving water were detected but not quantified (DNQ) based on 2 samples collected between September 2011 and December 2012 (RL= 50 µg/L and MDL = 2 µg/L). Therefore, dissolved iron in the discharge at Discharge Point No. 001 does not demonstrate reasonable potential to cause or contribute to an in-stream excursion above USEPA NAWQC recommended dissolved iron criterion for protection of aquatic life, and the WQBELs for iron have not been retained in this Order. Removal of these effluent limitations is in accordance with federal anti-backsliding regulations (see section IV.D.3 of the Fact Sheet).~~

~~**(2) Discharge Point No. 002.** The maximum observed effluent concentration for dissolved iron at Discharge Point No. 002 was 160 µg/L based on 2 samples collected in March and April of 2013. Therefore, dissolved iron in the discharge at Discharge Point No. 002 does not demonstrate reasonable potential to cause or contribute to an in-stream excursion above USEPA NAWQC recommended dissolved iron criterion for protection of aquatic life, and the WQBELs for iron have not been retained in this Order. Removal of these effluent limitations is in accordance with federal anti-backsliding regulations (see section IV.D.3 of the Fact Sheet~~

The Discharger conducted a study between September 2010 and December 2012 at Discharge Point 001 to determine dissolved versus total concentrations in the effluent discharge, and then at Discharge Point 002 between February 2011 and April 2013. Upstream receiving water samples were not obtained from Conaway Toe Drain, but two samples were obtained from Willow Slough Bypass on 13 September 2011 and 10 January 2012; however, analytical results for dissolved concentrations were not quantifiable, and therefore, reasonable potential based on the receiving waters cannot be

determined. The following table summarizes the analytical results both for total and dissolved concentrations in the effluent at both discharge points:

Table F-12 City of Davis Iron Study Results

Parameter	Number of Samples	Minimum Effluent Concentration (mg/L)	Maximum Effluent Concentration (mg/L)	Average Effluent Concentration (mg/L)
Discharge Point No. 001				
Dissolved Iron	29	0.03	0.20	0.10
Total Iron	28	0.55	2.46	1.20
Discharge Point No. 002				
Dissolved Iron	9	0.01	0.16	0.04
Total Iron	9	1.46	3.69	2.23

The 1976 Red Book cited a study by the Federal Water Pollution Control Administration (1967) conducted in iron polluted waters of Colorado River (a Western State water that should have water quality characteristics similar to waters within the Central Valley Region) that observed trout when "*waters were diluted or the iron had precipitated to effect a concentration of less than 1.0 mg/L*," implying dissolved concentrations. Because, in general, iron's bioavailability to aquatic life is greater in dissolved form than total, staff used the data for dissolved iron concentrations in the RPA. Based on the data shown in Table F-12, the MEC at Discharge Point 001 was 0.03 mg/L and 0.01 mg/L at Discharge Point 002, which is below the Colorado River scientific data of 1.0 mg/L and used in Order R5-2007-0132-02 to interpret compliance with the Basin Plan's narrative toxicity objective. Therefore, the effluent discharges do not demonstrate reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan's narrative toxicity objective. Thus, the WQBELs in Order R5-2010-0132-02 for iron have not been retained in this Order, and removal of these effluent limitations is in accordance with federal anti-backsliding regulations (see section IV.D.3 of the Fact Sheet).

USEPA Comment No. 2. Manganese

USEPA comments that the previous permit required the discharger to perform a study to determine a site specific objective for manganese to protect the agricultural use of the receiving water. USEPA contends that the tentative NPDES Permit provides no assessment of manganese and that it is not clear whether a RPA has been conducted for manganese.

RESPONSE: Central Valley Water Board staff concurs. The section IV.C.3.b of the Fact Sheet in the proposed NPDES Permit was changed to include a reasonable potential analysis for manganese, as shown in underline format below:

ii. Manganese – Discharge Points Nos. 001 and 002

(a) WQO. The Basin Plan contains a narrative chemical constituent objective. According to the Water Quality for Agriculture, Food and Agriculture Organization of the United Nations – Irrigation and Drainage Paper No. 29, Rev. 1 (Ayers and Westcot 1985 Study), manganese is "toxic to a number of crops at a few-tenths to a few mg/L, but usually only in acid soils." Further, when using the Ayers and Westcot 1985 Study to interpret narrative objectives, the State Water Board has directed the Central Valley Water Board to consider site-specific conditions. (In the Matter of Own Motion Review of City of Woodland, Order WQO 2004-0010.) To interpret the narrative chemical constituent objective, the previous permit (Order No. R5-2007-0132-02) required the Discharger to conduct a site-specific study for Manganese to determine the appropriate manganese level to protect beneficial uses of the area.

(b) RPA Results. Accordingly, the Discharger prepared an initial study workplan that was submitted on October 24, 2008. Based on Central Valley Water Board comments sent June 4, 2009, the study objectives were revised and a revised study workplan was submitted on January 10, 2010. On January 25, 2011, the City submitted the Manganese Study Addendum prepared by NewFields Agricultural & Environmental Resources, which satisfied the Manganese Study requirements. This study was an addendum to the previously submitted study titled: The Application of Water Quality Goals for Manganese and Fluoride in the Yolo Bypass (Stephen R. Grattan, 2007). Specifically, as part of the 2011 Manganese Study Addendum, NewFields conducted soil sampling analysis in response to the Central Valley Water Board's request for site-specific soil data. Based on these soil sample results, NewFields reached the following conclusions with respect to the potential for manganese toxicity to develop in local soils: (1) All soil pH levels were well above 5.5 (actually above 7.0 [neutral]), which is the threshold for toxic manganese conditions; (2) All soil manganese levels were below the toxic levels for crops grown within the study area; (3) Although the majority of the soil mapping units were temporarily water-logged due to flooding for rice, they did not have any other characteristics that cause manganese toxicity; (4) In general, all soils had a high clay content and

resultant higher cation exchange capacity, which can bind with manganese ions to make them unavailable to plants; and (5) All soils had sufficient levels of calcium, magnesium and sulfur such that these nutrients cause manganese to become unavailable to the plant. Because the soils are not conducive to manganese toxicity, the Manganese Study Addendum found no basis or literature examples for a recommended level of manganese in irrigation water.

Based on the site-specific study results, the Central Valley Water Board finds that there are not appropriate or applicable water quality criteria for manganese that would apply to Discharge Points No. 001 and No. 002 and the beneficial uses of the receiving waters. Accordingly, the Central Valley Water Board finds that there is no reasonable potential for manganese and water quality based effluent limitations are not necessary.

USEPA Comment No. 3. Compliance Schedules for EC and Methylmercury

USEPA contends that the Fact Sheet of the tentative NPDES Permit provides an inadequate explanation of how the compliance schedules for electrical conductivity and methylmercury meet the requirements of 40 CFR 122.47. USEPA further contends that the fact sheet must demonstrate that the compliance schedules will lead to compliance with the final effluent limitations "as soon as possible" and that the interim milestones are action-based and sufficient to ensure compliance at the end of the schedule.

RESPONSE: Central Valley Water Board staff concurs, in part. Below are the separate staff responses for electrical conductivity and methylmercury.

Electrical Conductivity (EC)

Central Valley Water Board staff concur that more explanation is needed for the compliance schedule for EC. The proposed NPDES permit has been changed in section VII.B.7.b of the Fact Sheet, as shown in underline/strikeout format below:

b. Compliance Schedule for Electrical Conductivity (Discharge Point Nos. 001 and 002). The Discharger has complied with the application requirements in paragraph 4 of the State Water Board's Compliance Schedule Policy and the Compliance Schedule for Electrical Conductivity meets the requirements of 40 CFR 122.47. In its request and justification for a compliance schedule for electrical conductivity, ~~and~~ the Discharger demonstrated the need for additional time to implement actions to comply with the new final effluent limitations for electrical conductivity. In order to achieve compliance with the final effluent limitations for electrical conductivity, the Discharger is pursuing a regional surface water supply project to improve the municipal water supply through conjunctive use with the existing groundwater supply. The compliance schedule in this Order includes milestones related to construction of new water intake

facilities, water treatment facilities, and new conveyance facilities, which collectively constitute the surface water supply project. Considering the size of the project and that it is regional in nature, the surface water supply project is not readily divisible into various stages. Further, because the time between these milestones is over one year in length, the compliance schedule requires Annual Progress Reports. The Annual Progress Reports will include detail with respect to construction progress to demonstrate the plant is being constructed within the allotted time per the compliance schedule. The inclusion of Annual Progress Reports is consistent with the Compliance Schedule Policy and 40 CFR 122.47. The new surface water supply will ~~may~~ improve the effluent ~~influent~~ EC water quality ~~entering the Facility~~ but may not provide enough improvement to meet the new final effluent limitation. The Discharger has therefore requested additional time to assess the improvement to effluent water quality achieved once the new water supply is in service. This assessment will be conducted over one calendar year in order to account for seasonal variations in municipal water use. After this assessment period, the Discharger will compare reductions in EC with final limitations. If additional steps are necessary, the Discharger will implement source control measures proposed in the Salinity Minimization and Evaluation Plan within 6 months. The Central Valley Water Board finds that this compliance schedule based on the current information is as short as possible. Thus,~~. T~~this Order includes the compliance schedule and final compliance date of **1 January 2021** and establishes interim milestones to ensure that the Discharger continues to make progress towards achieving final compliance with the final effluent limitations by the final compliance date.

Methylmercury

Central Valley Board staff does not concur that more explanation is necessary for the compliance schedule for methylmercury. The Fact Sheet notes that the Basin Plan's Delta Mercury Control Program includes a compliance schedule and includes a final compliance date for the Discharger to meet waste load allocations for methylmercury by 2030. The Fact Sheet details the reasoning for Phase I compliance times and includes annual update reports as required when compliance milestones are greater than one year. No changes were made to the proposed NPDES Permit.

USEPA Comment No. 4. RPA Documentation

USEPA comments that the RPA Table in Attachment G should include all pollutants that were detected in the effluent and therefore, some information is missing from the table.

RESPONSE: Central Valley Water Board staff does not concur. Attachment G is used to show a summary of the data and analysis used to determine reasonable potential for constituents of concern. Constituents of concern include those with

reasonable potential, those with limited data, and those with no reasonable potential but warranting discussion. No changes were made to the proposed NPDES Permit.